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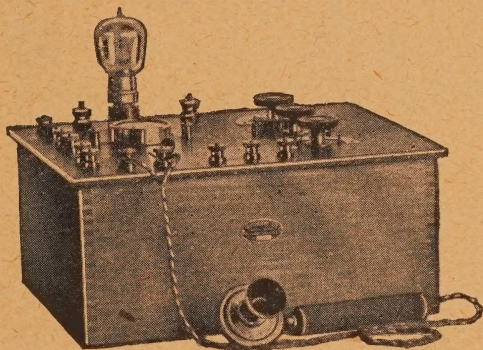
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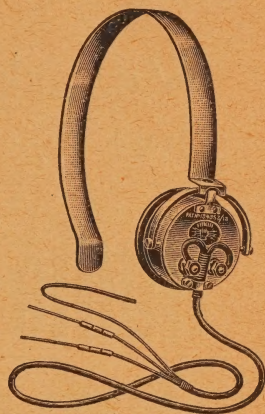
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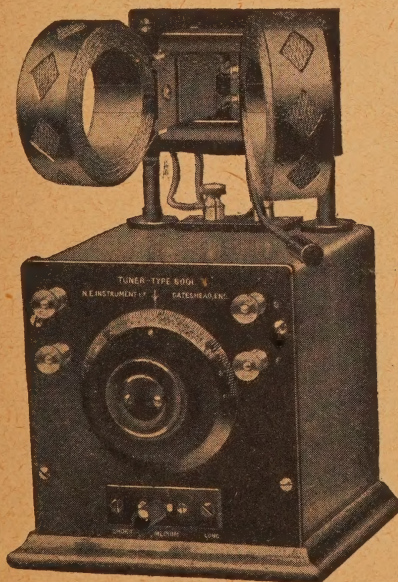
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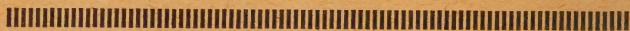
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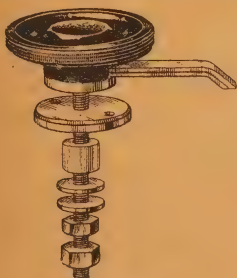
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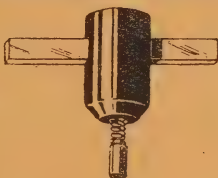
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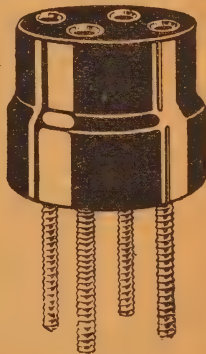
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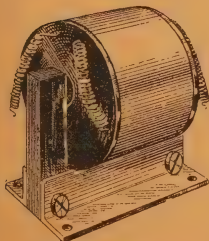
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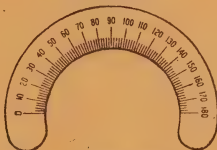
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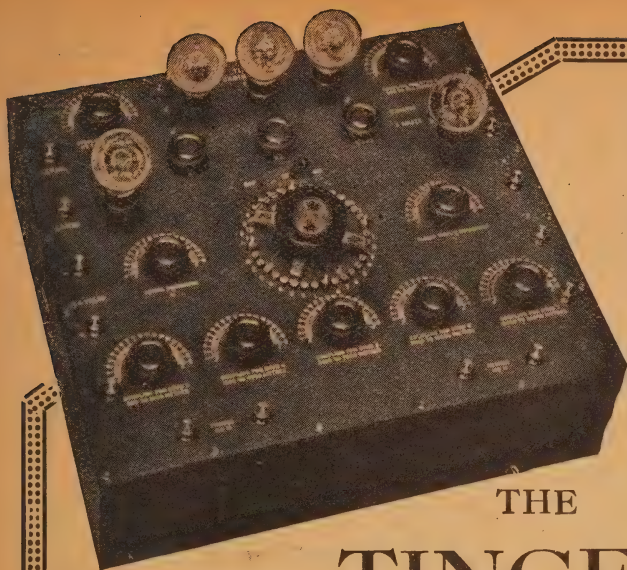
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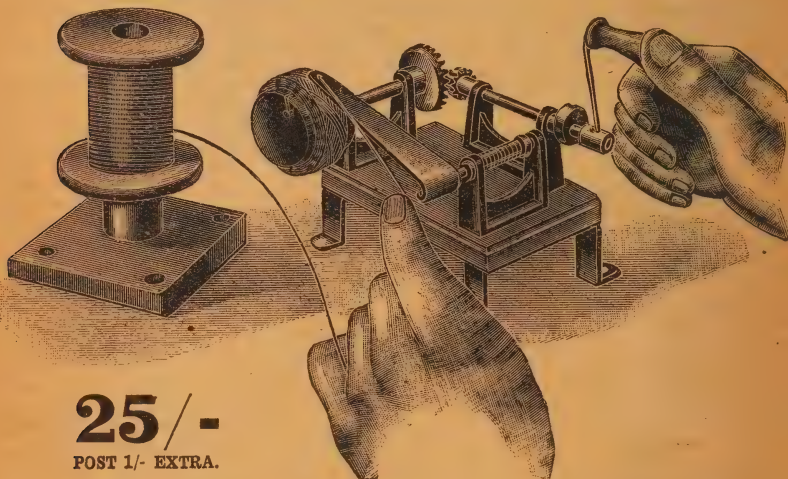
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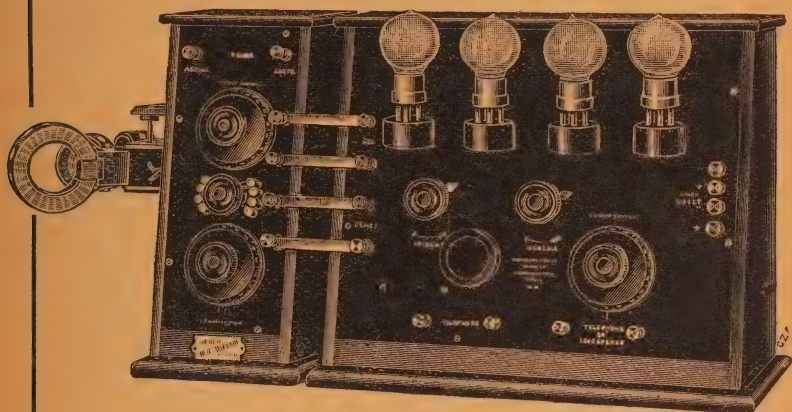
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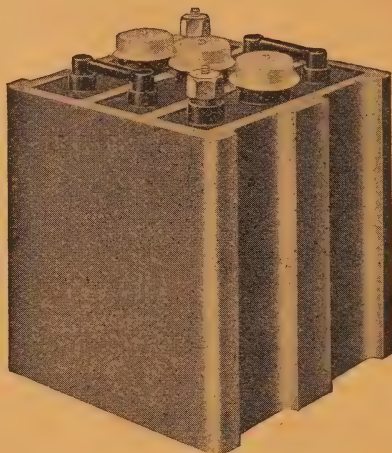
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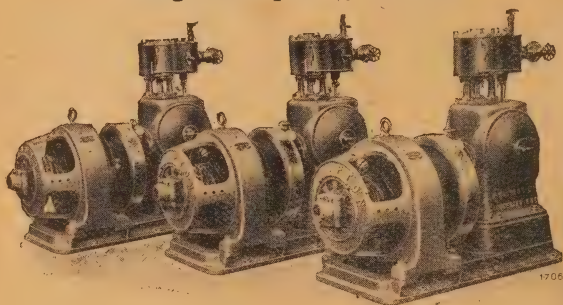
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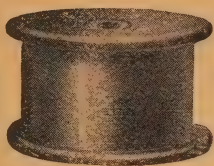
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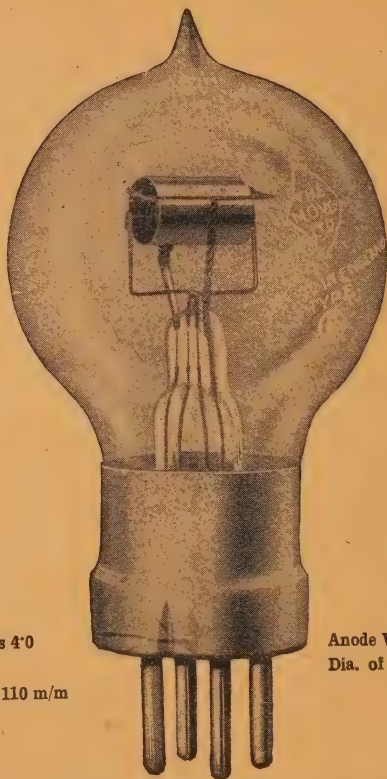
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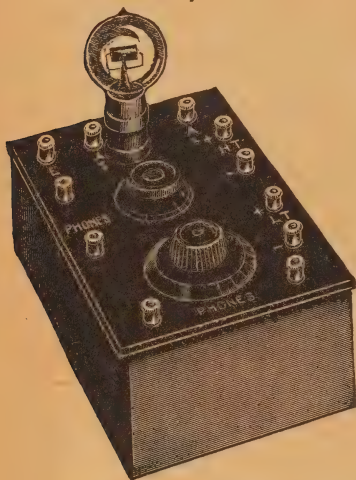
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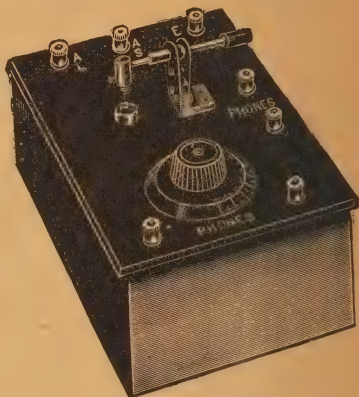
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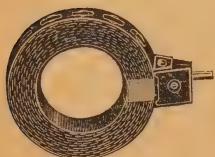


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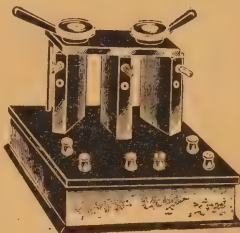


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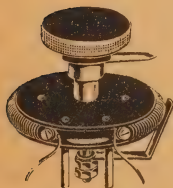
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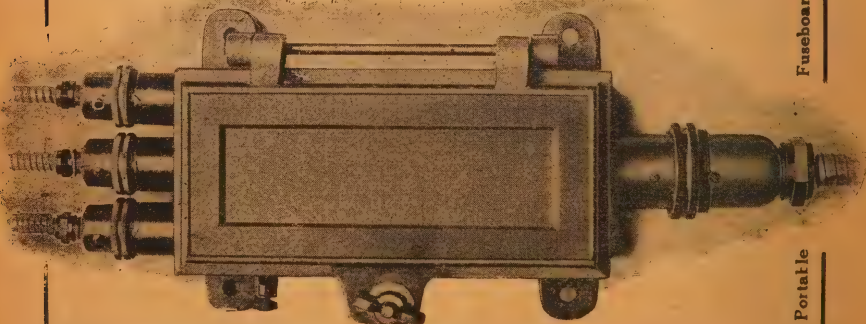
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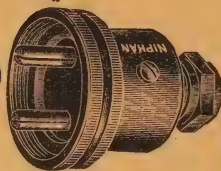
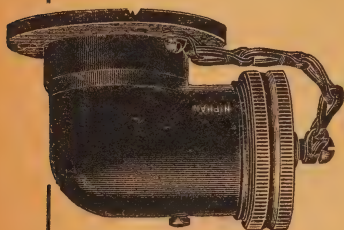
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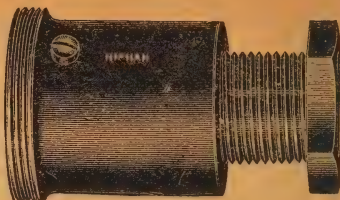
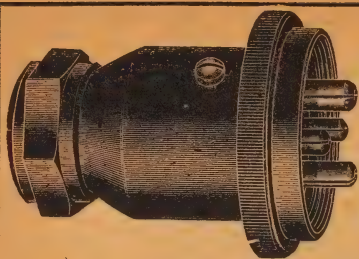


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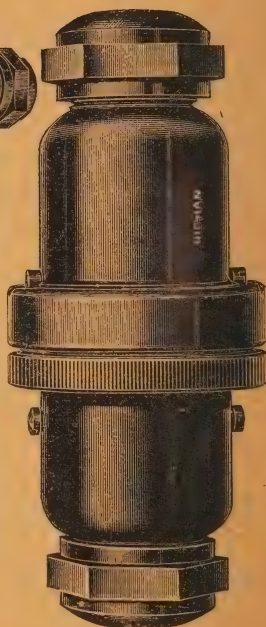
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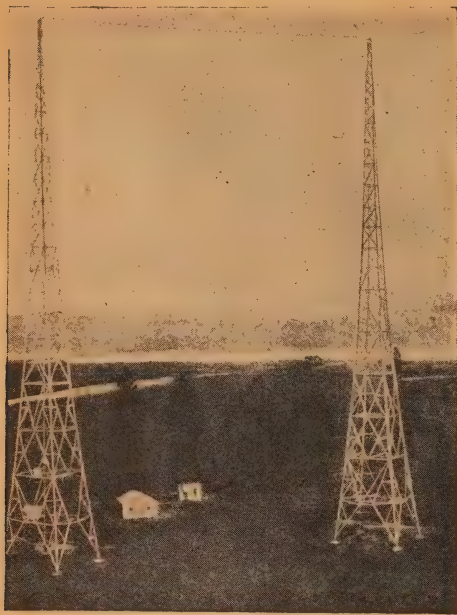
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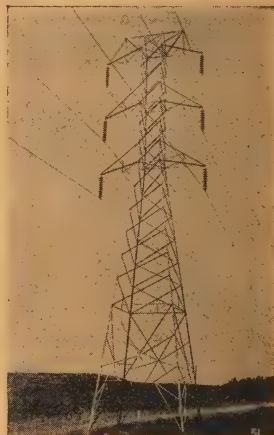
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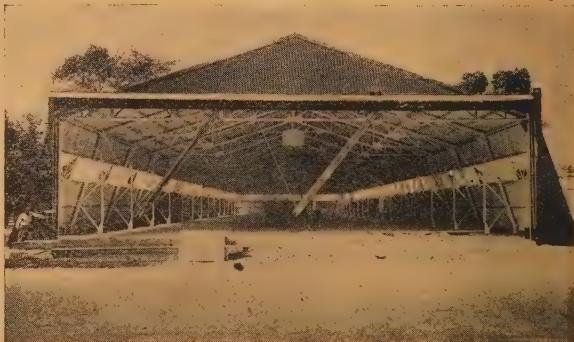
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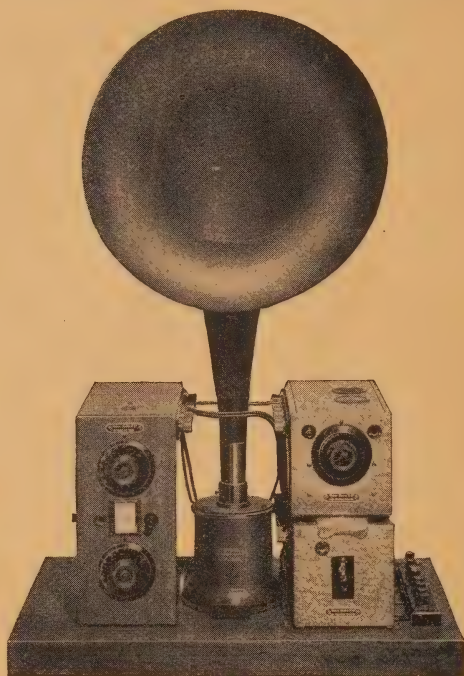
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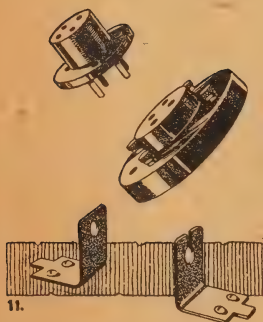
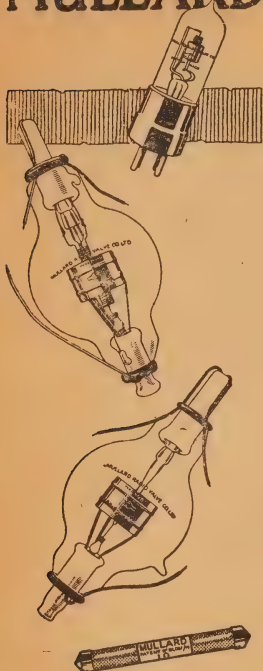
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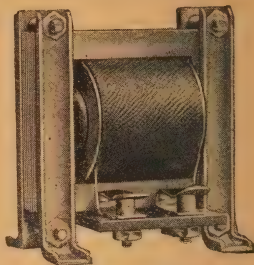
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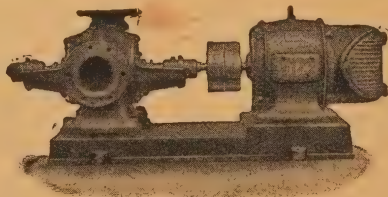
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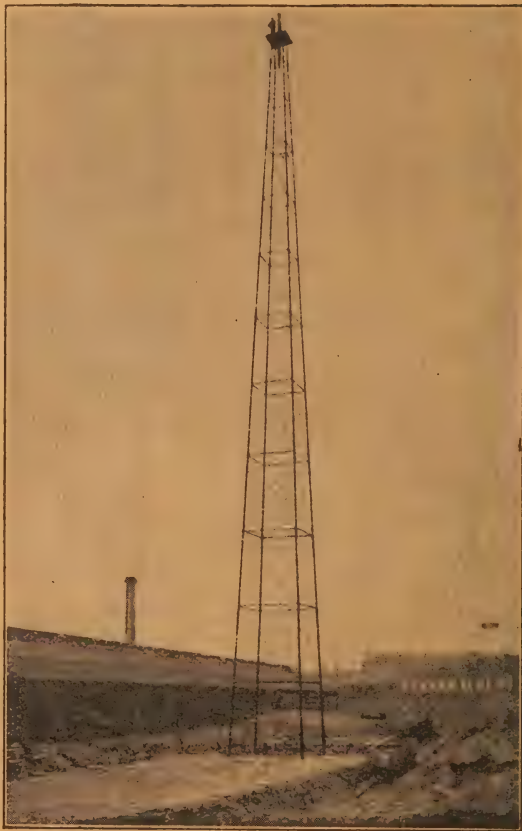
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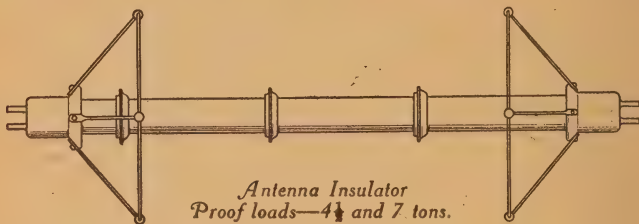
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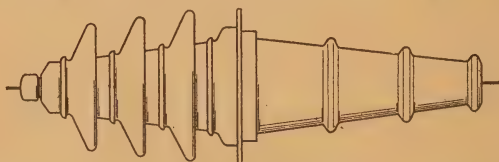
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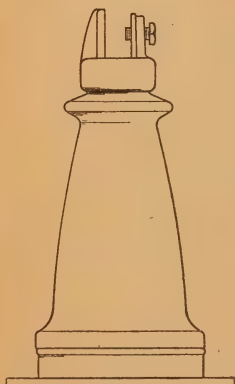
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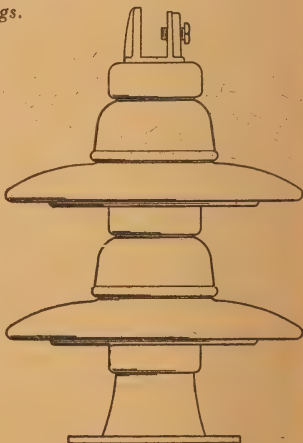
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PREFACE

THE outstanding development which the past year has witnessed has been the advent of Broadcasting in England. So long delayed, it has come at last, and radiotelephony has claimed a place in the life of every civilian. Coupled with this advent, the past year has seen an enormous expansion in the Amateur and Experimental movement creating practically a new industry. There has been no marked scientific development in wireless telegraphy or telephony but rather a steady expansion and consolidation of existing facilities, which has resulted in wireless communication taking its legitimate place and becoming one of the everyday necessities in the progress of modern civilised life. Large high-power wireless stations have been constructed in almost every country of the world and are in continuous daily operation at high speed. Those countries not already supplied are concluding arrangements for the construction of super stations for world wide communication and soon no one country will remain unconnected by wireless with any other country in the world.

Keeping pace with these various developments we have, in this edition, completely remodelled the *Year-Book* on an extensive scale, and, while the valuable existing features of its format have been retained, their scope has been so enlarged that this volume constitutes an almost entirely new production. All matter forming the basic material of the volume has been revised and carefully brought up-to-date and in every case the revision has resulted in the information therein contained being presented in a more concise and systematic manner, facilitating both reference and co-ordination.

The Map Section, a special feature, shows at a glance the position of every known land wireless station in the world, and, printed in two colours, forms a feature which will appeal to every wireless enthusiast.

Another additional section is that devoted to Radio Direction Finding, planned to provide reliable information on a subject which is daily gaining in importance, especially in the Air and Marine Services. In it will be found a résumé of the progress of Wireless Direction Finding and the Laws and Procedure governing its use in the various countries of the world.

PREFACE

A valuable Historical Survey has been prepared by J. St. Vincent Pletts, a well-known authority on wireless, which, together with the National Résumés for the past year forms a complete Record of the Development of Wireless Telegraphy and Telephony in the world.

The Directory of the Wireless Stations of the World, both commercial and experimental, and their particulars, together with the Amateur and Experimental Section, have received an exhaustive recompilation, the object continually in view being the production of a Wireless Year-Book which is a complete "*enquire within*" of wireless reference, both for those who are engaged in wireless as an occupation, as well as those who are merely interested in a subject which is second in importance to no other.

The latest authentic information, always difficult to obtain, has been diligently sought, with, we think, a high percentage of success, enabling us to present information of a most detailed nature and answering at a glance the hundred and one questions of daily occurrence in wireless.

We desire, in conclusion, to express our thanks to all those who have lent their ready assistance by supplying information and material for the compilation of what we think we may, with justice, claim to be the most complete and up-to-date reference book on wireless that has up to the present been produced in one handy volume.

THE EDITOR.

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1923.

CALENDAR

- (A) Almanack, January—December, 1923.
- (B) Tabular Calendars for 1922 and 1924.
- (C) List of the World's Official Holidays.

JANUARY, 1923

PHASES OF THE MOON.*

Jan. 3	○ Full Moon	h. m.	Jan. 17	● New Moon	h. m.
10	(Last Quarter	3 33 0 54	25	) First Quarter	2 41 3 59

SUN.*

Rises. Sets.

			h. m.	h. m.
1	M	Prof. Hertz died, 1894.	8 8	3 59
2	T	Joseph Milner born, 1744.	8 8	4 0
3	W	Capitulation of Port Arthur, 1905.	8 8	4 1
4	Th	Marshal Joffre born, 1852.	8 8	4 2
5	F	Sir I. Pitman born, 1813.	8 7	4 3
6	S	Epiphany. Twelfth day.	8 7	4 4
7	S	1st Sunday after Epiphany.	8 7	4 6
8	M	Evacuation of Gallipoli, 1916.	8 6	4 7
9	T	International Conference for Safety of Life at Sea closed, 1914.	8 6	4 8
10	W	British Penny Postage established, 1840.	8 5	4 10
11	Th	HILARY LAW SITTINGS BEGIN.	8 5	4 11
12	F	Burke born, 1729.	8 4	4 12
13	S	St. Hilary.	8 4	4 14
14	S	2nd Sunday after Epiphany.	8 3	4 15
15	M	British Museum opened, 1759.	8 2	4 17
16	T	Sir E. H. Shackleton reaches magnetic South Pole, 1909.	8 1	4 19
17	W	Benjamin Franklin born, 1706; died April 17th, 1790.	8 0	4 20
18	Th	Capt. Scott reached South Pole, 1912.	7 59	4 22
19	F	First German air raid by Zeppelins, 1915.	7 58	4 23
20	S	"Safety of Life at Sea" Convention signed at London, 1914.	7 57	4 25
21	S	3rd Sunday after Epiphany.	7 56	4 27
22	M	Queen Victoria died, 1901.	7 55	4 28
23	T	Republic wrecked, 1909. Passengers and crew saved.	7 54	4 30
24	W	Naval Battle off Dogger Bank, 1915.	7 53	4 32
25	Th	Conversion of St. Paul.	7 52	4 33
26	F	Death of General Gordon and Fall of Khartoum, 1885.	7 50	4 35
27	S	William II, ex-German Emperor, born, 1859.	7 49	4 37
28	S	Septuagesima Sunday. Röntgen Rays discovered, 1896.	7 48	4 39
29	M	Capitulation of Paris, 1871.	7 47	4 41
30	T	George Granville died, 1735.	7 45	4 42
31	W	Great Eastern steamer launched, 1858.	7 44	4 44

* The time shewn throughout this Calendar is Greenwich Mean Time.

FEBRUARY, 1923

PHASES OF THE MOON.

SUN.

Feb.	1 8	O	Full Moon (Last Quarter	h. m. 15 53 9 16	Feb. 15 24	●	New Moon) First Quarter	h. m. 19 7 0 6	Rises. Sets.	
									h. m.	h. m.
1	Th		Archbishop Whately born, 1787.						7 42	4 46
2	F		Candlemas.						7 41	4 48
3	S		British Telegraphs transferred to Government, 1870.						7 39	4 50
4	S		Sexagesima Sunday.						7 37	4 51
5	M		Carlyle died, 1881.						7 36	4 53
6	T		Sir H. Irving born, 1838.						7 34	4 55
7	W		Chas. Dickens born, 1812; died June 9th, 1870.						7 32	4 57
8	Th		Ruskin born, 1819.						7 31	4 59
9	F		Jules Michelet died, 1874.						7 29	5 0
10	S		Lord C. Beresford born, 1846.						7 27	5 2
11	S		Quinquagesima Sunday. T. A. Edison born, 1847. London University founded. 1826.						7 25	5 4
12	M		Darwin born, 1809.						7 24	5 6
13	T		Shrove Tuesday. Wagner died, 1883.						7 22	5 8
14	W		Ash Wednesday. Russia abandoned the Allies, 1918.						7 20	5 10
15	Th		Sir Wm. Preece born, 1834.						7 18	5 12
16	F		Lindley Murray died, 1826.						7 16	5 13
17	S		Sir Wilfred Laurier died, 1919.						7 14	5 15
18	S		1st Sunday in Lent. German Submarine blockade declared, 1915.						7 12	5 17
19	M		Alessandro Volta born, 1745; died March 5th, 1827.						7 10	5 19
20	T		Battle of Verdun begun, 1916.						7 8	5 21
21	W		Fall of Jericho, 1918.						7 6	5 22
22	Th		Prof. Hertz born, 1857.						7 4	5 24
23	F		Johann Karl Friedrich Gauss died, 1855.						7 2	5 26
24	S		St. Matthias.						7 0	5 28
25	S		2nd Sunday in Lent. Sir Christopher Wren died, 1723.						6 58	5 30
26	M		La Provence sunk in Mediterranean, 1916. 870 persons saved.						6 56	5 31
27	T		Relief of Ladysmith, 1900.						6 54	5 33
28	W		Montaigne born, 1533.						6 52	5 35

MARCH, 1923

PHASES OF THE MOON.

Mar.	3	○ Full Moon	h. m.	3	24	Mar.	17	● New Moon	h. m.	12	51
	9	(Last Quarter	18	31			25	) First Quarter	16	41	

SUN.

			Rises.	Sets.
			h. m.	h. m.
1	Th	<i>St. David.</i>	6 49	5 37
2	F	<i>St. Chad.</i>	6 47	5 39
3	S	Dr. Alexander Graham Bell born, 1847.	6 45	5 40
4	S	3rd Sunday in Lent. Inauguration Day, U.S.A.	6 43	5 42
5	M	Alessandro Volta died, 1827.	6 41	5 44
6	T	Michael Angelo born, 1475.	6 39	5 46
7	W	Sir E. Landseer born, 1802.	6 36	5 48
8	Th	Royal Institution founded, 1799.	6 34	5 49
9	F	Battle of Vimy Ridge, 1917.	6 32	5 51
10	S	Battle of Neuve Chapelle, 1915.	6 30	5 52
11	S	4th Sunday in Lent. Baghdad captured, 1917.	6 28	5 54
12	M	John F. Daniell born, 1790; died March 13th, 1845.	6 25	5 56
13	T	Carl Marx died, 1883.	6 23	5 58
14	W	F. T. Klopstock died, 1803.	6 21	5 59
15	Th	Abdication of Czar, 1917.	6 19	6 1
16	F	Georg Simon Ohm born, 1787; died July 7th, 1854.	6 16	6 3
		Senatore G. Marconi married at St. George's, Hanover Square, to the Hon. Beatrice O'Brien, 1905.		
17	S	<i>St. Patrick.</i>	6 14	6 4
18	S	Passion Sunday.	6 12	6 6
		Dardanelles naval attack, 1915.		
19	M	First meeting of Empire War Cabinet, 1917.	6 10	6 8
20	T	Sir Isaac Newton died, 1727; born December 25th (O.S.), 1642.	6 7	6 9
21	W	Battle of Cambrai, 1918.	6 5	6 11
22	Th	<i>Maundy Thursday.</i> Battle of St. Quentin, 1918.	6 3	6 13
23	F	Laplace born, 1749.	6 0	6 14
24	S	<i>Sussex</i> torpedoed, 1916.	5 58	6 16
25	S	Palm Sunday. LADY DAY.	5 56	6 18
26	M	Battle of Gaza, 1917.	5 54	6 20
27	T	English Channel spanned by wireless, 1899.	5 51	6 21
		Wm. Konrad von Röntgen born, 1845		
28	W	Richard Sackville born, 1589.	5 49	6 23
29	Th	Swedenborg died, 1772.	5 47	6 25
30	F	Good Friday. Captain Scott died, 1912.	5 44	6 26
31	S	Robert Wilhelm Bunsen born, 1811, died August 6th, 1899.	5 42	6 28

APRIL, 1923

PHASES OF THE MOON.

SUN.

		h. m.				h. m.	
Apr	1	○ Full Moon	13 10	Apr.	16	● New Moon	6 28
	8	(Last Quarter	5 22		24	) First Quarter	5 20
		Apr. 30	○ Full Moon		21 h.	30 m.	

			Rises.	Sets.
			h. m.	h. m.
1	S	Easter Day. All Fools' Day.	5 40	6 30
2	M	Easter Monday. Battle of Copenhagen, 1801.	5 38	6 31
3	T	Easter Tuesday.	5 35	6 33
4	W	Sir William Crookes, O.M., died, 1919; born, June 17th, 1832.	5 33	6 35
5	Th	United States declared war on Germany, 1917.	5 31	6 36
6	F	Prof. Adolf Slaby died, 1913; born, 1850.	5 29	6 38
7	S	Commander Peary reached North Pole, 1909.		
		Archbishop of Canterbury born, 1848.	5 26	6 40
8	S	Low Sunday. Anglo - French Convention signed, 1904.	5 24	6 41
9	M	Vimy Ridge taken, 1917.	5 22	6 43
10	T	Swinburne died, 1909.	5 20	6 45
11	W	American Civil War commenced, 1861.	5 17	6 46
12	Th	Albert Medal (Royal Society of Arts) presented to Senatore G. Marconi, 1914.	5 15	6 48
13	F	Magdala, 1868.	5 13	6 50
14	S	President Lincoln assassinated, 1865.	5 11	6 51
15	S	2nd Sunday after Easter. Titanic disaster, 1912; over 700 lives saved.	5 9	6 53
16	M	HILARY LAW SITTINGS END.	5 7	6 55
17	T	Benjamin Franklyn died, 1790.	5 4	6 56
18	W	Earthquake and fire at San Francisco, 1906.	5 2	6 58
19	Th	Lord Beaconsfield died, 1881.	5 0	7 0
20	F	B. R. Gleig born, 1796.	4 58	7 1
21	S	"Mark Twain" died, 1910.	4 56	7 3
22	S	3rd Sunday after Easter. Foundation of Royal Society, 1662.	4 54	7 5
23	M	Shakespeare died, 1616.	4 52	7 6
24	T	Russo-Turkish War begun, 1877.	4 50	7 8
25	W	Senatore Guglielmo Marconi, G.C.V.O., born, 1874.	4 48	7 10
26	Th	Allied Troops land at Gallipoli, 1915.	4 46	7 11
27	F	Samuel F. B. Morse born, 1791; died, 1872.	4 44	7 13
28	S	Prof. Guthrie Tate born, 1831; died July 4th, 1901.	4 42	7 14
29	S	4th Sunday after Easter. EASTER LAW SITTINGS BEGIN.	4 40	7 16
30	M	Johann Karl Friedrich Gauss born, 1777; died February 23rd, 1855.	4 38	7 18

JUNE, 1923

PHASES OF THE MOON.

SUN.

June 6 (Last Quarter 9 19 | June 21) First Quarter 20 46				h. m.	
14 ● New Moon 12 42 | 28 ○ Full Moon 13 4					
				Rises.	Sets.
				h. m.	h. m.
1	F	Marlow died, 1593.		3 52	8 4
2	S	First British Patent for Wireless Telegraphy lodged, 1896.		3 51	8 5
3	S	1st Sunday after Trinity. King George V. born, 1865.		3 50	8 6
4	M	George III. born, 1738.		3 49	8 7
5	T	Earl Kitchener drowned, 1916.		3 49	8 8
6	W	EASTER LAW SITTINGS END.		3 48	8 9
7	Th	Messines Ridge captured, 1917.		3 47	8 10
8	F	Charles Reade born, 1814.		3 47	8 11
9	S	Charles Dickens died, 1870.		3 46	8 12
10	S	2nd Sunday after Trinity. André Marie Ampère born, 1775; died, 1836.		3 46	8 13
11	M	St. Barnabas.		3 46	8 13
12	T	Sir Oliver Lodge born, 1851.		3 45	8 14
13	W	James Clerk Maxwell born, 1831.		3 45	8 15
14	Th	Allied Economic Conference at Paris, 1916.		3 45	8 15
15	F	Trans-Atlantic flight by Alcock and Brown, 1919.		3 44	8 16
16	S	Drummond Castle lost, 1896. TRINITY LAW SITTINGS BEGIN.		3 44	8 16
17	S	3rd Sunday after Trinity. Sir W. Crookes born, 1832.		3 44	8 17
18	M	War with U.S.A., 1812. Waterloo, 1815.		3 44	8 17
19	T	Field-Marshal Earl Haig born, 1861.		3 44	8 18
20	W	Accession of Queen Victoria, 1837.		3 44	8 18
21	Th	Germans sink their warships at Scapa Flow, 1919.		3 44	8 18
22	F	M. Poincaré announced to the Académie des Sciences Becquerel's discovery of a positive electron in a Crookes tube, 1908.		3 45	8 19
23	S	Formal institution of Royal Society of Edinburgh, 1783.		3 45	8 19
24	S	4th Sunday after Trinity. St. John the Baptist. Midsummer Day.		3 45	8 19
25	M	Horne Tooke born, 1736.		3 45	8 19
26	T	Lord Kelvin born, 1824; died December 17th, 1907.		3 46	8 19
27	W	Navigation Acts repealed, 1849.		3 46	8 19
28	Th	Peace signed between Germany and the Allies, 1919		3 47	8 19
29	F	St. Peter.		3 47	8 19
30	S	Tower Bridge opened, 1894. Lord Rayleigh died 1919; born Nov. 12th, 1842.		3 48	8 19

JULY, 1923

PHASES OF THE MOON.						SUN.	
July 6 (Last Quarter		h. m.	July 21) First Quarter		h. m.		
14 ● New Moon		1 56 12 45	27 ○ Full Moon		1 32 22 33	Rises.	Sets.
						h. m.	h. m.
1	S	5th Sunday after Trinity. British Offensive opened on the Somme, 1916.				3 48	8 18
2	M	Rousseau died, 1771.				3 49	8 18
3	T	Sadowa, 1866.				3 50	8 18
4	W	Declaration of American Independence, 1776.				3 50	8 17
5	Th	Dr. Wm. Crotch born, 1775.				3 51	8 17
6	F	King George's marriage, 1893.				3 52	8 17
7	S	Daylight Air Raid on London, 1917.				3 53	8 16
8	S	6th Sunday after Trinity. Joseph Chamberlain born, 1836; died July 2nd, 1914.				3 54	8 15
9	M	Conquest of German South-West Africa, 1915.				3 55	8 15
10	T	Marryat born, 1792.				3 56	8 14
11	W	Bombardment of Alexandria, 1882.				3 57	8 13
12	Th	Electric Units Bill legalising electric standards passed Congress, U.S.A., 1894.				3 58	8 12
13	F	R 34 accomplished Atlantic Flight, 1919.				3 59	8 11
14	S	Bastille stormed, 1789. French Public Holiday.				4 0	8 10
15	S	7th Sunday after Trinity. Battle of the Marne begun, 1918.				4 1	8 9
16	M	Nicholas II. of Russia assassinated, 1918.				4 2	8 8
17	T	Béranger died, 1857.				4 3	8 7
18	W	Foch's counter-attack begun, 1918.				4 4	8 6
19	Th	Dean Stanley died, 1881.				4 6	8 5
20	F	St. Margaret.				4 7	8 3
21	S	Robert Burns died, 1796.				4 8	8 2
22	S	8th Sunday after Trinity. St. Mary Magdalene.				4 9	8 1
23	M	Austrian Ultimatum to Serbia, 1914.				4 11	8 0
24	T	Honorary G.C.V.O. conferred on Senatore Marconi, 1914.				4 12	7 58
25	W	Clifden W/T Station destroyed by Irish Republicans, 1922.				4 13	7 57
26	Th	W. M. Praed born, 1802.				4 15	7 55
27	F	Captain Fryatt shot, 1916.				4 16	7 54
28	S	Austria-Hungary declared war on Serbia, 1914.				4 18	7 53
29	S	9th Sunday after Trinity. TRINITY LAW SITTINGS END. Spanish Armada dispersed, 1588.				4 19	7 52
30	M	First Church Service Broadcasted in England, 1922				4 20	7 51
31	T	Passing of British Telegraph Act, 1868.				4 22	7 49

AUGUST, 1923

PHASES OF THE MOON.

Aug. 4	(Last Quarter	h. m.	Aug. 19	) First Quarter	h. m.
12	● New Moon	19 22	26	○ Full Moon	6 7
		11 17			10 29

SUN.

			Rises.	Sets.
			h. m.	h. m.
1	W	Dr. Alexander Graham Bell died, 1922. Inventor of the telephon.	4 23	7 48
2	Th	Fall of Soissons, 1918.	4 25	7 46
3	F	Germany declared war on France, 1914.	4 26	7 45
4	S	Great Britain declared war on Germany, 1914. First International Wireless Conference met at Berlin, 1903. Suspension of Transatlantic Wireless Service, 1917	4 28	7 43
5	S	10th Sunday after Trinity. <i>Transfiguration</i> . First British-American cable worked, 1858.	4 30	7 41
6	M	BANK HOLIDAY	4 31	7 40
7	T	Sainte Assise Radio Station opened, 1922.	4 33	7 38
8	W	Walton born, 1593.	4 34	7 36
9	Th	Heligoland formally ceded to Germany, 1890.	4 37	7 34
10	F	France declared war on Austria-Hungary, 1914.	4 39	7 32
11	S	Cardinal Newman died, 1890.	4 40	7 31
12	S	11th Sunday after Trinity. Great Britain declared war on Austria-Hungary, 1914.	4 42	7 29
13	M	Liège forts destroyed, 1914.	4 43	7 27
14	T	Walter Besant born, 1836.	4 45	7 25
15	W	Panama Canal opened, 1914.	4 47	7 23
16	Th	Robert Wilhelm Bunsen died, 1899; born March 31st, 1811. William Hyde Wollaston born, 1776; died, December 22nd, 1828.	4 48	7 21
17	F	Frederic the Great died, 1786.	4 50	7 19
18	S	Leaffield Station opened, 1921. (First link of Empire Wireless Chain.)	4 51	7 17
19	S	12th Sunday after Trinity. White Star liner <i>Arabic</i> sunk by German submarine, 1915.	4 53	7 15
20	M	Italy declared war on Turkey, 1915.	4 55	7 13
21	T	Michelet born, 1798.	4 57	7 11
22	W	Fall of Namur, 1914.	4 59	7 9
23	Th	Chas. Augustin de Coulomb born, 1736; died, 1806	5 1	7 7
24	F	<i>St. Bartholomew</i> . Louvain destroyed, 1914.	5 2	7 5
25	S	Conquest of Togoland, 1914.	5 3	7 3
26	S	13th Sunday after Trinity. Roumania declared war on Austria-Hungary, 1916.	5 4	7 1
27	M	Italy declared war on Germany, 1916.	5 5	7 0
28	T	Germany declared war on Roumania, 1916. Trial of first submarine telegraph, 1850.	5 6	6 58
29	W	Locke born, 1632.	5 7	6 55
30	Th	Turkey declared war on Roumania, 1916.	5 9	6 52
31	F	Hermann von Helmholtz born, 1821; died September 8th, 1894.	5 11	6 49

SEPTEMBER, 1923

PHASES OF THE MOON.

SUN.

Sept. 3	☾ Last Quarter	h. m. 12 47	Sept. 17	☽ First Quarter	h. m. 12 4
10	● New Moon	20 53	25	○ Full Moon	1 16

Rises. Sets.

h. m. h. m.
5 12 6 47

5 14 6 45

5 15 6 43

5 17 6 41

5 19 6 38

5 20 6 36

5 22 6 34

5 23 6 32

5 25 6 29

5 27 6 27

5 28 6 25

5 30 6 23

5 31 6 20

5 33 6 18

5 35 6 16

5 36 6 13

5 38 6 11

5 39 6 9

5 41 6 6

5 43 6 4

5 44 6 2

5 46 5 59

5 47 5 57

5 49 5 55

5 50 5 53

5 52 5 50

5 54 5 48

5 55 5 46

5 57 5 43

5 59 5 41

St. Giles. Fall of Péronne, 1918.**14th Sunday after Trinity.**

Board of Trade (Great Britain) constituted, 1786.

Fall of Riga, 1917.

First Night Aeroplane Raid on London, 1917.

Cardinal Richeleau born, 1586.

Mayflower sailed, 1620.*St. Evurtius.*Sir John Henniker Heaton, Bart., died, 1914;
born 1848.**15th Sunday after Trinity.**Luigi Galvani born, 1737; died December 4th,
1798.

Sir John Soane born, 1752.

First Battle of the Aisne, 1914.

Rt. Hon. H. H. Asquith born, 1852.

Quebec taken, 1759.

Holy Cross.

Liverpool and Manchester Railway opened, 1830.

16th Sunday after Trinity.

Mr. A. Bonar Law born, 1858.

London and Birmingham Railway opened, 1838.

Jean Barnard Leon Foucault born, 1819; died
March 11th, 1908.Col. Thomas Thomasson Heftye died, 1921;
Director-General of Telegraphs, Norway.

Delhi Day.

*St. Matthew.*Michael Faraday born, 1791; died August 25th,
1867.**17th Sunday after Trinity.**

Autumnal Equinox.

Dean Milman died, 1868.

Bulgarians proposed armistice, 1918.

King of Denmark born, 1870.

George Cruikshank born, 1792.

British captured Kut-el-Amara, 1915.

*St. Michael and All Angels.***18th Sunday after Trinity.**

Surrender of Bulgaria, 1918.

OCTOBER, 1923

PHASES OF THE MOON.

SUN.

								SUN.	
Oct.	3	(Last Quarter	h. m.	5 29	Oct.	16	) First Quarter	h. m.	20 54
	10	● New Moon		6 5		24	○ Full Moon		18 26
								Rises.	Sets.
								h. m.	h. m.
1	M	Pheasant shooting begins.						6 0	5 39
2	T	Renan died, 1892.						6 2	5 37
3	W	Benjamin Jowett died, 1893.						6 3	5 34
4	Th	German proposal for armistice, 1918.						6 5	5 32
5	F	Republic of Portugal proclaimed, 1910.						6 7	5 30
6	S	Invasion of Serbia by Germans, 1915.						6 8	5 28
7	S	19th Sunday after Trinity						6 10	5 25
8	M	G. du Maurier died, 1896.						6 12	5 23
9	T	Cambrai retaken, 1918.						6 13	5 21
		Germans occupied Antwerp, 1914.							
10	W	Panama Canal completed, 1913.						6 15	5 19
11	Th	Vulturno burnt in mid-Atlantic, 1913. 521						6 17	5 16
		persons saved.							
12	F	Nurse Cavell shot by Germans, 1915.						6 18	5 14
13	S	MICHAELMAS LAW SITTINGS BEGIN.						6 20	5 12
14	S	20th Sunday after Trinity. Great Britain						6 22	5 10
		declared war on Bulgaria, 1915.							
15	M	The Gregorian Calendar introduced, 1582.						6 24	5 8
16	T	Houses of Parliament burnt, 1834.						6 25	5 5
17	W	John Wilkes born, 1727.						6 27	5 3
18	Th	St. Luke.						6 29	5 1
19	F	Sir Charles Wheatstone born, 1802; died, 1875.						6 30	4 59
		First battle of Ypres began, 1914.							
20	S	Froude died, 1894.						6 32	4 57
21	S	21st Sunday after Trinity. Trafalgar Day.						6 34	4 55
		Death of Lord Nelson, 1805.							
22	M	Edouard Branly born, 1844.						6 36	4 53
23	T	John Jortin born, 1698.						6 37	4 51
24	W	French Victory at Verdun, 1916.						6 39	4 49
25	Th	St. Crispin.						6 41	4 47
26	F	Aleppo taken, 1918.						6 43	4 45
27	S	Austria sued for peace, 1918.						6 44	4 43
28	S	22nd Sunday after Trinity. St. Simon and						6 46	4 41
		St. Jude.							
29	M	Keats born, 1795.						6 48	4 39
30	T	Armistice with Turkey, 1918.						6 50	4 37
31	W	Beersheba taken, 1917.						6 51	4 35

NOVEMBER, 1923

PHASES OF THE MOON						SUN.	
Nov.	I	(	Last Quarter	h. m.	Nov. 15	) First Quarter	h. m.
	8	●	New Moon	15 27	23	○ Full Moon	9 41 12 58
						Rises.	Sets.
						h. m.	h. m.
1	Th		<i>All Saints.</i>	Naval Battle off Coronel, 1914.		6 53	4 33
2	F		<i>All Souls.</i>			6 55	4 32
3	S			Yarmouth bombarded, 1914.		6 57	4 30
4	S		23rd Sunday after Trinity.			6 59	4 28
5	M		Great Britain declared war on Turkey, 1914.			7 0	4 26
			James Clerk Maxwell died, 1879.				
6	T		Sir Wm. Preece died, 1913; born Feb. 15th, 1834.			7 2	4 25
7	W		"London Gazette" first published, 1555.			7 4	4 23
8	Th		John Milton died, 1674.			7 6	4 21
9	F		King Edward VII born, 1841.			7 7	4 20
10	S		British at Mons, 1918.			7 9	4 18
11	S		24th Sunday after Trinity.			7 11	4 16
			<i>Martinmas.</i> Armistice Day.				
12	M		International Conference for Safety of Life at Sea opened, 1913.			7 13	4 15
			Lord Rayleigh born 1842; died June 30th, 1919.				
13	T		Prof. Clerk Maxwell born, 1831; died November 5th, 1879.			7 15	4 13
14	W		Earl Roberts, V.C., died, 1914.			7 16	4 12
15	Th		<i>St. Machutus.</i>			7 18	4 11
16	F		First Fleming Valve Patent taken out, 1904.			7 20	4 9
17	S		<i>St. Hugh.</i>			7 21	4 8
18	S		25th Sunday after Trinity.			7 23	4 6
			Sir Stanley Maude died, 1917.				
19	M		Ferdinand de Lesseps born, 1805; died December 7th, 1894.			7 25	4 5
20	T		<i>St. Edmund.</i> Tolstoi died, 1910.			7 27	4 4
21	W		James Hogg died, 1835.			7 28	4 3
22	Th		<i>St. Cecilia.</i>			7 30	4 2
23	F		<i>St. Clement.</i>			7 31	4 1
24	S		Faraday's discovery of magneto-electricity announced to Royal Society, 1831.			7 33	4 0
25	S		26th Sunday after Trinity.			7 35	3 58
			Sir Isaac Newton born, 1642; died March 20th, 1727.				
26	M		Wm. Cowper, poet, born, 1731; died April 25th, 1800.			7 36	3 57
27	T		Maintenon born, 1728.			7 38	3 56
28	W		Washington Irving died, 1859.			7 39	3 55
29	Th		Dr. J. A. Fleming born, 1849.			7 41	3 54
30	F		<i>St. Andrew.</i>			7 42	3 54

DECEMBER, 1923

PHASES OF THE MOON.

		h. m.				h. m.	
Dec. 1	(Last Quarter	9	0	Dec. 15	First Quarter	2	38
8	● New Moon	1	30	23	○ Full Moon	7	33
Dec. 30	☾ Last Quarter	21	h. 7 m.				

SUN.

Rises. Sets.

			h. m.	h. m.
1	S	Queen Alexandra born, 1844.	7 44	3 54
2	S	Advent Sunday. Austerlitz, 1805. Fall of Monastir, 1915.	7 45	3 53
3	M	Thomas Carlyle born, 1795.	7 47	3 52
4	T	R. L. Stevenson died, 1894; born, November 13th, 1850.	7 48	3 52
5	W	Admiral Jellicoe born, 1859.	7 49	3 51
6	Th	St. Nicholas. Germans captured Bucarest, 1916.	7 51	3 51
7	F	Transatlantic Amateur Tests start, 1921.	7 52	3 50
8	S	Falkland Islands Battle, 1914.	7 53	3 50
9	S	2nd Sunday in Advent. Jerusalem occupied by British, 1917.	7 54	3 50
10	M	Capt. Ross Smith completed aeroplane flight from London to Australia, 1919.	7 55	3 49
11	T	William Blake died, 1898.	7 56	3 49
12	W	First Transatlantic wireless message, 1901.	7 57	3 49
13	Th	St. Lucy. Dr. Samuel Johnson died, 1784.	7 58	3 49
14	F	George Washington died, 1799; born, February 22nd, 1732.	7 59	3 49
15	S	I. Walton died, 1683.	8 0	3 49
16	S	3rd Sunday in Advent. Amundsen reached the South Pole, 1911.	8 1	3 49
17	M	Transatlantic Amateur Tests finish, 1921. Lord Kelvin died, 1907.	8 2	3 49
18	T	Sir J. J. Thomson born, 1856.	8 3	3 50
19	W	Slavery abolished in U.S.A., 1862.	8 4	3 50
20	Th	Bishop Thomas Wilson born, 1663.	8 4	3 50
21	F	St. Thomas. MICHAELMAS LAW SITTINGS END.	8 5	3 51
22	S	Winter Solstice.	8 5	3 51
23	S	4th Sunday in Advent.	8 6	3 52
24	M	James Prescott Toule born, 1818.	8 6	3 52
25	T	Christmas Day.	8 7	3 53
26	W	St. Stephen. BOXING DAY.	8 7	3 53
27	Th	St. John.	8 8	3 54
28	F	Holy Innocents.	8 8	3 55
29	S	W. E. Gladstone born, 1809, died May 19th, 1898.	8 8	3 56
30	S	1st Sunday after Christmas. H.M.T. Aragon sunk, 1917.	8 8	3 57
31	M	St. Silvester.	8 8	3 58

1922 CALENDAR 1922

JANUARY	FEBRUARY	MARCH	APRIL
S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 31 W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 — T .. 2 9 16 23 — F .. 3 10 17 24 — S .. 4 11 18 25 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 31 S .. 4 11 18 25 —	S .. — 2 9 16 23 30 M .. 3 10 17 24 — T .. 4 11 18 25 — W .. 5 12 19 26 — T .. 6 13 20 27 — F .. 7 14 21 28 — S 1 8 15 22 29 —
MAY	JUNE	JULY	AUGUST
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SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
S .. — 3 10 17 24 M .. — 4 11 18 25 T .. — 5 12 19 26 W .. — 6 13 20 27 T .. — 7 14 21 28 F .. 1 8 15 22 29 S .. 2 9 16 23 30	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 31 W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 — S .. 4 11 18 25 —	S .. — 3 10 17 24 31 M .. — 4 11 18 25 — T .. 5 12 19 26 — W .. 6 13 20 27 — T .. 7 14 21 28 — F 1 8 15 22 29 — S 2 9 16 23 30 —

1924 CALENDAR 1924

JANUARY	FEBRUARY	MARCH	APRIL
S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 31 F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 3 10 17 24 M .. — 4 11 18 25 T .. — 5 12 19 26 W .. — 6 13 20 27 T .. — 7 14 21 28 F .. 1 8 15 22 29 S .. 2 9 16 23 —	S .. — 2 9 16 23 30 M .. 3 10 17 24 31 T .. 4 11 18 25 — W .. 5 12 19 26 — T .. 6 13 20 27 — F .. 7 14 21 28 — S 1 8 15 22 29 —	S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 — F .. 4 11 18 25 — S .. 5 12 19 26 —
MAY	JUNE	JULY	AUGUST
S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 31	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 — W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 31 F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 3 10 17 24 31 M .. — 4 11 18 25 — T .. 5 12 19 26 — W .. 6 13 20 27 — T .. 7 14 21 28 — F 1 8 15 22 29 — S 2 9 16 23 30 —
SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 — T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 31 S .. 4 11 18 25 —	S .. — 2 9 16 23 30 M .. 3 10 17 24 — T .. 4 11 18 25 — W .. 5 12 19 26 — T .. 6 13 20 27 — F .. 7 14 21 28 — S 1 8 15 22 29 —	S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 31 T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD

ALGERIA.

- * January 1.
- Easter Monday.
- Ascension Day.
- Whit Monday.
- * Fête Nationale, July 14.
- Assumption, August 15.
- All Saints' Day, November 1.
- * Christmas Day, December 25.
- * If these days fall two days before or after Sunday, the intervening day is a Customs holiday.

ARGENTINA

- January 1 and 6.
- February 6, 7 and 8.
- March 19.
- Maundy Thursday.
- Good Friday.
- Easter Saturday.
- Easter Sunday.
- Ascension Day.
- May 25 and 26.
- June 29.
- July 9.
- August 15 and 30.
- October 12 (Buenos Aires only).
- November 1 and 11.
- December 8 and 25.

AUSTRALIA.

- New Year's Day.
- Good Friday.
- Easter Saturday and Monday, and Banks and Offices Tuesday also. (Tuesday is not observed in New South Wales.)
- King's Birthday.
- Prince of Wales's Birthday.
- Christmas Day.
- Boxing Day.
- Anzac Day (April 25).
- Eight-Hour Day (different day in each State; day celebrating the granting of an eight-hour working day in those States where the principle is legalised).
- New South Wales—First Monday in October.
- Queensland—1st May.
- Each of the States has also a holiday known as Anniversary Day, to celebrate its foundation. In each State there are holidays, annual and declared, with regard to local events and anniversaries.
- In New South Wales January 26 (Anniversary Day) and first Monday in August are also holidays.
- In Victoria there are also local holidays: Foundation Day (January 26); Eight-Hour Day (April 23); and in Melbourne and vicinity, Melbourne Cup Day (first Tuesday in November), and Picnic Day.
- In Western Australia, Anniversary Day (June 1) and the Monday following October 26 are also holidays; also one day in March (Lumpers' Picnic Day).
- In South Australia, at Port Adelaide, the following are observed as holidays as announced in Government Gazette: New Year's Day (January 1); Foundation Day (January 31); Good Friday; Easter Monday; King's Accession (May 6); King's Birthday (June 5); Prince of Wales's Birthday (June 27); Eight-Hour Day (October 8); Christmas Day (December 25); Proclamation Day (December 28); Anniversary of the State.

BARBADOS.

- January 1 (if on Sunday, Monday is the holiday: Good Friday, Easter Monday.
- Whit Monday, May 24 (Empire Day), first Monday in August, first Monday in October, November 9, December 25 (Christmas Day), December 26 (Boxing Day) (if on Sunday, Monday is the holiday).

BELGIUM.

- New Year's Day
- Easter Monday.
- Ascension Day.
- Whit Monday.
- August 15, Assumption.
- November 1, All Saints' Day
- November 11.
- December 25, Christmas Day

BERMUDA.

- Good Friday, May 24th (Empire Day),
- December 25th (Christmas Day),
- December 26th (Boxing Day).

BRAZIL.

- January 1, 6.
- February 24.
- April 21.
- May 1, 3 and 13.
- June 29.
- July 14.
- August 15.
- September 7.
- October 12.
- November 1, 2 and 15.
- December 8 and 25.
- Easter (Good Friday and Monday) and Carnival—(seven weeks previous) (Monday, Tuesday and Wednesday).
- Ascension Day.
- Corpus Christi.
- Various other holidays of a local nature are observed in the different States.
- January 20 and September 20 are Federal District holidays.

BRITISH GUIANA.

- Easter Monday, Whit Monday, first Monday in August, December 26 (Boxing Day) (if on Sunday, Monday is the holiday).

BRITISH HONDURAS.

- The Birthday of the Sovereign.
- The Birthday of the Heir to the Throne.
- Empire Day (May 24).
- St. Georges' Caye Day, (September 10).
- New Year's Day.
- Christmas Day (December 25).

BRITISH INDIA.

- New Year's Day, Easter (Friday to Monday), King-Emperor's Birthday, Christmastide (three days), and various Native Religious Festivals.

CANADA.

- New Year's Day. January 6, Epiphany.*
- Good Friday. Ascension Day.* All Saints' Day.* Conception Day.* Easter Monday. Christmas Day.
- Empire Day (May 24).
- July 1, Dominion Day.
- First Monday in September (Labour Day).
- King's Birthday, June 3, and any day proclaimed as a general Fast or Thanksgiving.

* These holidays are observed only in the Province of Quebec.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

CHILE.

January 1. Good Friday and Saturday.
Ascension Day. May 21 (National
Feast). Corpus Christi. June 29. August
14. September 18 and 19 (National
Feast). November 1. December 8 and 25.

CHINA (HONG-KONG).

Empire Day.
Every Sunday.
The first week-day of January.
Chinese New Year's Day, or if that day
should be a Sunday then the following
day. Provided that if the Chinese
hereafter adopt the Gregorian Calendar
then the second week-day in January.
The first week-day following Chinese New
Year's Day.

Good Friday.
The day following Good Friday.

Easter Monday

The Birthday of His Majesty the King,
unless it shall be ordered by the Gov-
ernor, by an order published in the
Gazette, that His Majesty's Birthday is to
be kept on some other day, and then,
such other day.

Whit Monday.

The first week-day in July.

The first Monday in August.

The second Monday in October.

Armistice Day.

Christmas Day, or if that day should be
a Sunday then the following day.

The twenty-sixth day of December, or
if that day should be a Sunday then
the following day, unless Christmas Day
fall on a Sunday then the Tuesday
following Christmas Day.

CHINA (SHANGHAI).

New Year (January 1 and 2).

Chinese New Year (4 days, February 1-4).

Easter (3 days).

Whitsuntide (1 day).

October 10 (Anniversary of Republic).

Christmas (December 25 and 26).

In addition, the Banks keep the following
holidays:—Dragon Boat Festival (June),
Midsummer (July 1 and 2), Autumn
(First Monday in August), and Mid-
Autumn Festival, Chinese (September).

The Customs usually observe New Year
(3 days), Good Friday, Chinese New
Year, Dragon Boat and Mid-Autumn
Festivals, Anniversary (Oct. 11), Procla-
mation (Feb. 12) of Republic,
December 22 and Christmas Day.

COCHIN CHINA (FRENCH).

New Year's Day. Chinese New Year
Festival. Easter Monday. Ascension
Day. Whit Monday. July 14. Assump-
tion (August 15). October 10. All
Saints' Day (November 1). All Souls'
Day (November 2), and Christmas Day.

If January 1, July 14, August 15 or Decem-
ber 25 fall on Sunday, the following day
is a legal holiday.

COLOMBIA.

January 1 and 6. Maundy Thursday. Good
Friday. Ascension Day. St. Peter
(June 29). July 20, Independence Day.
August 7 and 15. October 12. All
Saints' (November 1). December 8.
Christmas Day.

COSTA RICA.

January 1.
Three days in Holy Week (Semana Santa).
May 1, Opening of Congress.
September 15, Independence Anniversary
October 12, Columbus Day.
Christmas Day.

CUBA.

January 1.
February 24.
May 20.
October 10.
December 7.
December 25.
Good Friday is not a legal holiday, but
is very strictly observed.

DENMARK.

New Year's Day. Easter (Thursday, Good
Friday and Monday). April 22 (Prayers
Day). Ascension Day. Whit Monday.
June 5 (Constitution Day) after noon
Christmas Day and December 26, in
addition to all Sundays.

DUTCH EAST INDIES.

April 19.
April 30.
August 2.
August 31.
New Year's Day.
Good Friday.
Easter Monday.
Ascension Day.
Whit Monday.
Christmas (December 25 and 26).

ECUADOR.

January 1, New Year's Day.
Good Friday.
August 10, Independence Days of Quito
October 9, and Guayaquil.
December 25, Christmas Day.

EGYPT.

Sultan's Birthday (March 26).
Sham-El-Nissim.
The King's Accession Day (May 6).
The King's Birthday (June 3).
Ramadan Bairam.
Qurban Bairam.
Holy Carpet (variable).
Mohammedan New Year's Day.
Sultan's Accession Day (October 9).
Birthday of the Prophet (November 12).
Sundays are also observed.

ESTHONIA.

New Year's Day (January 1).
Epiphany (January 6).
Declaration of the Independence (Feb. 24).
Day of Prayer and Repentance.
Thursday before Good Friday.
Good Friday.
Easter Sunday, Monday and Tuesday.
May Day (May 1).
Ascension Day. Maundy Thursday.
Pentecost Sunday, Monday and Tuesday.
Midsummer Day (June 24).
Martinmas.
Christmas Sunday, Monday and Tuesday

FINLAND.

January 1 and 6; March 25; Easter (Good
Friday and Easter Monday); Ascen-
sion Day; June 24 (Midsummer Day).
Christmas Day and December 26.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES
OF THE WORLD—continued.

FRANCE.

New Year's Day. Easter. Ascension Day. Whitsuntide. French National Fête, July 14. Assumption, August 15; All Saints' Day. Christmas Day.

GERMANY.

New Year's Day. Good Friday. Easter Monday. Ascension Day. Whit Monday. Third Wednesday in November (day of Fasting and Prayer). December 25 and 26.

GREECE.

New Year's Day (January 14). Epiphany (January 19). Independence Day (April 7). Good Friday. Saturday before Easter. Easter Monday. St. George's Day (May 6). Ascension. Holy Ghost. St. Peter (July 12). Assumption (August 28). St. Demetrius's Day (November 8). Christmas, January 6, 7 and 8. Dates given are new style.

The Shipping Community also observe S. Nicolas's Day and S. Spiridion's Day (December 19 and 25). Customs observe also Christmas Eve, S. Constantine's Day (June 3), S. Nicolas (December 19), S. Spiridion (December 25).

GUATEMALA.

January 1. March 15. Easter. June 30. September 15 (Independence Day). October 28. November 21. December 25.

HAITI.

All Sundays, January 1 and 2, May 1. Holy Thursday, Good Friday, Mardi Gras, Day of Pentecost, Fête Dieu, Petite Dieu (half-day afternoon), August 15, November 1 and 2, December 25.

HOLLAND.

New Year's Day, Easter Monday, Ascension Day, Whit Monday, Christmas Day and December 26.

HONDURAS (REPUBLIC).

New Year's Day. Holy Week and Independence Day (September 15). Christmas Day.

ITALY.

New Year's Day. Easter Sunday. Christmas Day. Epiphany. Ascension Day. June 24 (St. John the Baptist) (at Genoa), August 15, Assumption. September 20 (National Holiday). November 1, All Saints' Day, November 4, Victory Day.

At Civita Vecchia, April 28, S. Fermina is observed.

JAMAICA.

January 1, Ash Wednesday, Good Friday, Easter Monday, Whit Monday, May 24 (Empire Day), August 1, December 25 (Christmas Day), December 26 (Boxing Day).

JAPAN.

January 1 and 2. January 3 and 5. February 11. March 22 (changeable). Good Friday. Easter Monday. April 3. July 30. - First Monday in August (Summer Holiday). August 31. September 24 (changeable). October 17. October 31. November 23. Christmas Day. December 26. December 31.

LATVIA.

January 1 and 6. Recognition Day (January 26). Thursday before Good Friday. Good Friday. Easter Monday. Easter Tuesday. May 1. Ascension Day. Day of Victory (June 22). Whit Monday. Whit Tuesday. June 23 and 24. Independence Day (November 18). December 25, 26, 27.

LIBERIA.

New Year's Day (January 1); Pioneer's Day (January 7); Decoration Day (March 12); Good Friday (April 2); National Fast Day (April 11); Independence Day (July 26); National Flag Day (August 24); Thanksgiving Day (November 6); Newport Day (December 1); Christmas Day (December 25).

MEXICO.

New Year's Day. Epiphany (January 6). Constitution Day (February 5). Thursday before Easter. Good Friday. St. Joseph (March 19). May 5. Ascension Day. Corpus Christi. Assumption (August 15). September 16. All Saints' Day (November 1). All Souls' Day (November 2). Conception Day (December 8). December 12. Christmas Day.

MOROCCO.*

Aid Seghir. Aid-el-Kebir. Ashora. Mouloud two days.

NEW ZEALAND (DUNEDIN).

January 1 and 2. Good Friday. Easter Monday. Anzac Day (April 25). King's Birthday (June 3). Labour Day (fourth Monday in October). Christmas Day (December 25). Boxing Day (December 26).

NEW ZEALAND (WELLINGTON).

New Year's Day. Good Friday. Day after Good Friday. Easter Monday. The Sovereign's Birthday (June 3). Labour Day (4th Monday in October). Christmas Day. Day after Christmas Day.

NICARAGUA.

January 1. Holy Thursday and Friday. July 4 and 14. September 14 and 15. October 12 and December 25.

NORWAY.

New Year's Day. Maundy Thursday. Easter Day and Easter Monday. May 17 (half-holiday). Ascension Day. Whit

* The dates for these Moorish feasts cannot be stated with accuracy, as they are fixed by the new moon, and the Musulman calendar.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—continued.

NORWAY—continued.

Sunday. Whit Monday. Pray Day,
November 3. Christmas Day and De-
cember 26.

PANAMA (CANAL ZONE).

New Year's Day. Washington's Birthday
(February 22). Good Friday. Decoration
Day (May 30). U.S. Independence Day
(July 4). Labour Day. First Monday in
September. Panama Independence Day
(November 3). Thanksgiving Day (last
Thursday in November). Christmas Day.
If a legal holiday fall on a Sunday, the
Monday following will be observed as a
legal holiday.

PANAMA (REPUBLIC OF).

January 1, New Year's Day. January 21,
Foundation of the City of Panama.
February 15, Signing of the Act of
Independence of Panama. Shrove
Tuesday, "Martes del Carnaval." Holy
Thursday. Good Friday. May 1, Labour
Day. July 4, Independence of the
United States. July 24, Birthday of
Simon Bolivar. October 1, every fourth
year—Inauguration of the New President
(half-day). October 12, Discovery of
America. November 3, Independence of
Panama from Colombia. November 28,
Independence from Spain. December 25,
Christmas Day.

PARAGUAY.

January 1, February 3, May 14 and 15.
August 15. October 12. November 25.
December 8 and 25.

PERU.

January 1 and 6. Shrove Monday and
Tuesday. Ash Wednesday (half-day).
March 19 (St. Joseph). Thursday and
Friday before Easter. Ascension Day.
Corpus Christi (movable). June 29.
July 28, 29 and 30. August 15 and 30.
September 24. October 12. November 1.
December 8 and 25.

POLAND.

January 1 and 6. February 2. March 25.
Easter Day. Good Saturday and Easter
Monday. Ascension Day, Corpus Christi,
(May 3 and 8). June 29. August 15.
September 8. November 1. December 8.
Christmas (December 24, 25 and 26).

PORTO RICO.

New Year's Day. February 22 (Washing-
ton's Birthday). March 22 (Abolition of
Slavery). Good Friday. May 30 (Decora-
tion Day). July 4 (Declaration of
Independence). July 25 (Day of Landing
of Americans). First Monday in Septem-
ber (Labour Day). October 12 (Columbus
Day). Last Thursday in November
(Thanksgiving Day). December 25
(Christmas Day).

PORTUGAL (LISBON).

January 1 and 31.
May 3.
June 10.
October 5.
December 1 and 25

RUMANIA.

January 7, 8 and 9 (Christmas Holidays).
January 14 (New Year's Day). January
19 (Epiphany). January 20 (St. John the

Baptist). February 6, National Holiday
(Union of Principalities). February 15
(Purification). March 27 (Proclamation
of Rumania as a Kingdom). April 7
(Annunciation Day). Easter Monday and
Tuesday (Greek). May 6 (St. George's
Day). May 23 (King's Coronation).
Ascension Day (Greek). June 3 (SS.
Constantine and Helen). Whit Monday
(Greek). July 12 (SS. Peter and Paul).
August 2 (St. Elias). August 19 (Trans-
figuration). August 28 (Assumption Day).
September 11 (Death of St. John the
Baptist). September 21 (Nativity of
B.V.M.). September 27 (Exaltation of the
Cross). November 8 (St. Demetrius).
November 21 (SS. Michael and Gabriel).
December 4 (Presentation). December 19
(St. Nicholas).

Dates given are New Style.

RUSSIA.

January 7 (Christmas Day). January 8
(2nd Christmas Day). January 9 (3rd
Christmas Day). January 14 (New Year's
Day). January 19 (Epiphany). February
15 (Purification). Carnival Day. Carnival
Second Day. April 7 (Annunciation of
Blessed Virgin Mary). Palm Sunday.
Thursday before Good Friday. Good
Friday. Easter Saturday. Easter
Monday. Easter Tuesday. Easter
Wednesday. Easter 6th Day. May 22,
St. Nicholas's Day. Ascension Day.
June 8, Holy Ghost Day. Whit Monday.
July 12, St. Peter and St. Paul. August
19, Transfiguration. August 28, Assump-
tion Blessed Virgin Mary. September 11,
Death of St. John the Baptist. Septem-
ber 12. St. Alexander Nevsky. Septem-
ber 21, Nativity of Blessed Virgin Mary.
September 27, Exaltation of Cross.
October 9, St. John the Evangelist.
October 14, Intercession of Blessed
Virgin Mary. November 4, Virgin of
Kazan. December 4, Presentation of
Blessed Virgin Mary.

Dates given are New Style.

SALVADOR.

January 1 and 6. March 1 and 15. Wednes-
day, Thursday, Friday and Saturday in
Holy Week. Ascension Day. June 22.
July 14. August 5 and 6. September 15
(Independence Day). October 12,
November 1 (All Saints') and November 5.
December 8, 24 and 25.

SANTO DOMINGO.

New Year's Day.
January 6.
Independence Day (February 27).
Corpus Christi.
August 16 (Spanish evacuation).
Las Mercedes (September 24).
Holy Week (Thursday and Friday).
Christmas Day.

SIAM.

King's Birthday (January 1).
Siamese New Year (April 1).
Memorial Day of King Rama V. (October
23).
Accession Day (November 11).

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—continued.

SOUTH AFRICA (UNION OF).

New Year's Day.
Good Friday.
Easter Monday.
Empire Day (May 24).
Union Day (May 31).
Ascension Day.
First Monday in August.
First Monday in October.
Dingaan's Day (December 16).
Christmas Day.
Boxing Day.

SPAIN.

January 1, Circumcision. January 6,
Twelfth Night. March 19, St. Joseph.
Holy Thursday. Good Friday. Ascen-
sion Day. Corpus Christi. June 29,
SS. Peter and Paul. July 25, St. James
August 15, Assumption. November 1,
All Saints' Day. December 8, Immacu-
late Conception. December 25, Christ-
mas Day.

STRAITS SETTLEMENTS.

New Year's Day (January 1).
Chinese New Year (February 16 and 17).
Taipusum (one day).
Easter (March 30, 31 and April 1).
Whit Monday (May 21).
King's Birthday.
Hari Raya Puaba (one day).
First Monday in August.
November 10 and 12.
Christmas (December 25 and 26).

SWEDEN.

January 1. January 6.
Annunciation (March 25).
Good Friday.
Day before Easter Holidays.
Easter Monday.
May 1.
Ascension Day.
Day before Whit Sunday.
Whit Monday.
June 23 and 24.
December 24, 25, 26 and 31.

TASMANIA.

January 1, New Year's Day.
January 26 (Foundation of Australia
Anniversary).
Eight-Hour Day.
Good Friday.
Easter Monday.
The King's Birthday (June 3).
Prince of Wales's Birthday (June 23).
Day of Wharf Labourers' Union Picnic.
Christmas Day, December 25.
December 26.
When Anniversary Day or King's Birth-
day falls on any day but Monday, the
following Monday is observed instead,
and whenever Christmas Day falls on
Sunday the two days following are
Bank Holidays. When any other
holiday falls on Sunday the following
Monday is a Bank Holiday.

TRINIDAD.

January 1. Good Friday. Easter Monday.
Whit Monday. May 24 (Empire Day).
Corpus Christi. July 31. Discovery Day.
December 25 (Christmas Day).

TRIPOLI (BARBARY).

New Year's Day.
Epiphany (January 6).
Ascension Day (May 29).
August 15.
September 20.
All Saints' Day (November 1).
Christmas Day.

TURKEY.

January 1, New Year's Day, N.S.
January 7, Christmas Day, O.S.
January 14, New Year's Day, O.S.
January 19, Epiphany, O.S.
July 23, National Holiday.
August 15, Assumption, N.S.
August 28, Assumption, O.S.
November 1, All Saints' Day, N.S.
December 25, Christmas Day.
Bairam (one day).
Good Friday, N.S.
Easter Monday, N.S.
Holy Thursday, O.S.
Easter Monday, O.S.
Ascension, N.S. Ascension, O.S.
Pentecost, N.S. Pentecost, O.S.
Rossess (Jewish New Year's Day).
Pessah (Jewish Easter).
Kifour (Fête du Pardon).
Mevload (Birthday of Mahomet).
Holy Gregory (Armenian Holiday).
Mahomet's Birthday.
Sheker-Bairam (3 days).
Courban-Bairam (4 days).

TURK'S ISLAND.

January 1. Good Friday. December 25
(Christmas Day).

UNITED STATES OF AMERICA.

January 1. New Year's Day: In all
States and District of Columbia, Porto
Rico, Hawaii, and Alaska, except
Massachusetts.
January 8. Anniversary of the Battle of
New Orleans: In Louisiana.
January 19. Lee's Birthday: In Alabama,
Arkansas, Florida, Georgia, North Caro-
lina, South Carolina, and Virginia.
February 12. Georgia Day: In Georgia.
February 12. Lincoln's Birthday: In
California, Colorado, Connecticut, Dela-
ware, Illinois, Indiana, Iowa, Kansas,
Kentucky, Michigan, Minnesota, Mont-
ana, Nebraska, Nevada, New Jersey,
New York, North Dakota, Oregon, Penn-
sylvania, South Dakota, Washington,
West Virginia, and Wyoming.
February 14. Admission Day: In
Arizona.
February 17. Mardi Gras, Shrove Tues-
day: In Alabama and Florida (in
counties having a carnival): in Louisiana,
in the parishes of Orleans, St. Bernard,
Jefferson, St. Charles, and St. John the
Baptist.
February 22. Washington's Birthday:
In all the States, District of Columbia,
Porto Rico, Hawaii, and Alaska.
March 2. Anniversary of Mexican Inde-
pendence: In Texas.
March 4. Inauguration Day: In District
of Columbia in years when a President
of the United States is inaugurated.
March 22. Emancipation Day: In Porto
Rico.
March 25. Maryland Day: In Maryland.
April 2. Good Friday: In Alabama

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—continued.

UNITED STATES OF AMERICA—continued.

Connecticut, Delaware, Florida, Louisiana, Maryland, Minnesota, New Jersey, Pennsylvania, Porto Rico, Tennessee.

April 12. Halifax Independence Resolutions: In North Carolina.

April 13. Thomas Jefferson's Birthday: In Alabama.

April 19. Patriots' Day: In Maine and Massachusetts.

April 21. Anniversary of the Battle of San Jacinto: In Texas.

April 26. Confederate Memorial Day: In Alabama, Florida, Georgia, and Mississippi.

May 10. Confederate Memorial Day: In North Carolina and South Carolina.

May (Second Friday). Confederate Day: In Tennessee.

May 20. Anniversary of the Signing of the Mecklenburg Declaration of Independence: In North Carolina.

May 30. Decoration Day: In all the States and District of Columbia, Porto Rico, Hawaii, and Alaska, except Arkansas, Florida, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. Confederate Memorial Day: In Virginia.

June 3. Jefferson Davis's Birthday: In Alabama, Florida, Georgia, Mississippi, South Carolina, and Texas. In Louisiana, known as "Confederate Memorial Day."

June 17. Kamehameha Day: In Hawaii.

June 15. Pioneer Day: In Idaho.

July 4. Independence Day: In all the States, and District of Columbia, Porto Rico, Hawaii, and Alaska.

July 24. Pioneers' Day: In Utah.

July 25. Landing of American Troops: Porto Rico.

August 1. Colorado Day: In Colorado.

August 16. Bennington Battle Day: In Vermont.

September 3. Labour Day: In all the States and District of Columbia, Porto Rico, Hawaii and Alaska.

September (Third Saturday). Regatta Day: In Territory of Hawaii.

September 9. Admission Day: In California.

September 12. "Defenders' Day": In Maryland.

October (First Monday): Missouri Day (commemorative of Missouri history) In Missouri.

October (Second Friday). Farmers' Day: In Florida.

October 12. Columbus Day: In Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Idaho, Illinois,

Indiana, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Porto Rico, Rhode Island, Texas, Vermont, Washington, West Virginia.

October 18. Alaska Day: In Alaska.

October 31. Admission Day: In Nevada.

November 1. All Saints' Day: In Louisiana.

November 6. General Election Day: In most of the States.

November (usually the last Thursday).

Thanksgiving Day: Is observed in all the States and in the District of Columbia, Porto Rico, Hawaii, and Alaska, although it is not a statutory holiday in all.

December 25. Christmas Day: In all the States and the District of Columbia, Porto Rico, Hawaii and Alaska.

Arbor Day: In some of the States. The date is not uniform.

Saturday Afternoon: In many of the States and cities and District of Columbia.

Sundays and Fast days are legal holidays in all the States which designate them as such.

There is no National holiday, not even the Fourth of July. Congress has at various times appointed special holidays. In the second session of the Fifty-third Congress it passed an Act making Labour Day a public holiday in the District of Columbia, and it has recognised the existence of certain days as holidays for commercial purposes; but, with the exception named, there is no general statute on the subject. The proclamation of the President designating a day of Thanksgiving only makes it a legal holiday in the District of Columbia and the Territories.

URUGUAY.

January 1 and 6. February 3 and 28.

April 19. May 1, 18 and 25. June 29.

July 4, 14 and 18. August 15 and 25.

September 20. October 12. November 1.

December 8 and 25. Also Monday and Tuesday preceding Ash Wednesday (Carnival), and Thursday, Friday and Saturday in Holy Week.

VENEZUELA.

January 1.

Holy Thursday and Good Friday.

April 19.

July 5.

July 24.

**RECORD OF DEVELOPMENT
OF WIRELESS TELEGRAPHY
AND TELEPHONY**

(A) Historical Survey.

(B) National Résumés, 1922.

RECORD OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY AND TELEPHONY, AND INTERESTING ITEMS IN CONNECTION THEREWITH

The record below is intended to constitute a résumé, arranged in chronological order, of the outstanding events in wireless telegraphy from year to year.

This is a feature which has figured in the YEAR-BOOK from its initiation in 1913. The record of the earlier years has now been consolidated under appropriate headings, while that for the last few years remains under annual headings. The record for the past year will be found in an extended form at the end of this section.

(A) HISTORICAL SURVEY.

Prelude.

In 1840 Joseph Henry produced high frequency oscillations by the discharge of a condenser, and in 1853 Lord Kelvin in a paper, "On Transient Electric Currents," deduced mathematically the conditions necessary for electrical oscillations in a circuit, and showed that if the resistance was negligible the frequency was inversely proportional to the geometric mean of the capacity and inductance. In 1873 James Clerk Maxwell published his great work, "Electricity and Magnetism," wherein he showed mathematically that an electrical oscillation in a circuit would give rise to an electromagnetic disturbance, which would travel away as a free wave with a finite velocity. He also postulated that light was such an electromagnetic wave.

In 1887 Heinrich Rudolph Hertz produced Maxwell's electromagnetic waves, and was able to measure their length and velocity and to show that they followed the ordinary laws of interference, refraction, and polarisation. In 1892 Edouard Branly discovered that a coherer, similar to the tube of filings which had been used by David Hughes some 13 years earlier, was very sensitive to electromagnetic waves. In 1894 Sir Oliver Lodge repeated some of the experiments of Hertz with improved apparatus, including coherers instead of the minute spark gaps used by Hertz.

Plain Aerial.

In 1896 Guglielmo Marconi took out the first patent for Hertzian Wave Telegraphy (No. 12039 of 1896), according to which, besides many minor improvements in the apparatus, one end of the Hertzian dumb-bell oscillator was buried in the earth, and the other end was elevated into the air; and with this apparatus he succeeded in communicating nearly two miles. In 1897 Sir Oliver Lodge took out a patent for Syntonic Wireless Telegraphy, according to which, by sacrificing some of the radiating properties of the Marconi aerial, he obtained more prolonged oscillations and better selectivity.

1898 Wireless Telegraphy found its first practical use in connecting the East Goodwin lightship with the shore, while in the following year communication was established across the English Channel, a distance of 85 miles was attained between two ships at sea, and Wireless Telegraphy was first used for military purposes in the South African War.

Coupled Circuits.

In 1900 Marconi patented coupled circuits, which enabled more energy to be transmitted and greater selectivity to be obtained. In 1901 the five principal islands of the Hawaiian group were connected up by Wireless telegraphy, and at the end of the year signals were received across the Atlantic in St. John, Newfoundland, from Poldhu, Cornwall—a distance of

1,800 miles. Early in 1902 messages were received at more than 1,500 miles, and signals up to a distance of more than 2,000 miles from shore to ship, while at the end of the year the first wireless message, as distinct from mere signals, was transmitted across the Atlantic. This year also saw the introduction of the Marconi magnetic detector.

In 1903 V. Poulsen, improving on the work done by W. Dudell three years' earlier, introduced the arc generator of continuous oscillations.

New Detectors.

In 1904 J. A. Fleming, developing the so-called Edison effect which had been known since 1883, produced the thermionic valve. In 1905 Marconi introduced directional aërials. In 1906 H. H. C. Dunwoody discovered that carborundum crystals, and G. W. Picard that silicon crystals, could be used as wireless detectors; and R. A. Fessenden invented heterodyne reception. In 1907 Lee de Forrest, who had the previous year put a third electrode into the Fleming valve, introduced the grid between the filament and the plate in his "Audion"; and in the same year E. Bellini and A. Tozi produced the Radiogoniometer, or Wireless Direction Finder. In 1908 Max Wien invented the quenched spark. In 1909 R. Goldschmidt designed his machine for generating continuous oscillations.

In 1910 messages were received on a ship at sea at a distance of 4,000 miles by day, and 6,735 miles by night, from Clifden. In 1911 R. von Lieben showed that the three electrode thermionic tube or triode could be used as a proportional relay. In 1912 the "Titanic" sank after striking an iceberg, the lives of more than 700 passengers being saved by her wireless call for assistance.

Telephony.

In 1913 A. Meissner produced continuous oscillations by the reaction of a triode upon itself, and C. S. Franklin utilised the same principle for the elimination of the losses in receiving circuits. In 1914 I. Langmuir produced really hard thermionic tubes, and entirely eliminated ionization therein.

Later in the year began the Great War, which temporarily suspended all commercial wireless, and left little to chronicle during its continuance. In 1915 a wireless telephone message was sent across the Atlantic from Arlington to the Eiffel Tower. In 1916 the determination of the difference in longitude between Paris and Washington with the aid of wireless telegraphy, which had been in progress since 1913, was completed, and the result found with a probable accuracy of the order of 0.01 second of time.

With the cessation of the war in 1918 it became known that, although there had been no outstanding discoveries in wireless telegraphy, a steady development had taken place, and, in particular, that the triode had become of the first importance, both as a receiving amplifier and as a generator of continuous oscillations, which had brought wireless telephony into the practical field. Later in the year messages transmitted from Carnarvon, Wales, were received in Sydney, Australia, a distance of 12,000 miles. In 1919 wireless rendered great assistance to the transatlantic flights of the American aeroplane and the British dirigible.

1920.

The Lafayette radio station at Bordeaux, which was under construction by the United States Navy during the war, was completed, and underwent tests during August and September. The first official message from this station was sent out on August 21st, 1920, and was addressed to the Secretary of the United States Navy. It ran as follows: "This first wireless message to be heard around the world marks a milestone on the road of scientific achievement."

The high power station at Sayville, which was closed by the United States authorities during the war, was reopened for traffic in April of this year, and a new station at Christiania was opened on January 10th for European traffic only, the Stavanger station being reserved for traffic with the United States.

A number of smaller coastal and other stations whose services were suspended during the war were reopened for traffic.

A number of D.F. stations both in this and other countries which were originally put up by Government Departments for wartime use, were also made available for merchant service purposes and have given valuable aid in navigation in difficult waters.

In order to relieve the congestion on the internal telegraph network, the German Government erected a number of medium power radio stations in the important industrial centres of the country. The majority of the pre-war Press, Time Signals, and Meteorological Services were re-established in most countries. A novelty in this direction was the establishment of an astronomical service from the Nauen Station to give information on important astronomical events to all neighbouring observatories, so that observations on outbursts of novæ and similar phenomena could be taken in hand without delay. The British Air Ministry established a comprehensive scheme of meteorological bulletins, which are transmitted both from their own station and from the Aberdeen Wireless Station several times during the twenty-four hours. These messages give the latest information about flying conditions over the British Isles and neighbouring countries.

The most noticeable improvements in commercial apparatus have been those of wireless telephonic apparatus carried out by Marconi's Wireless Telegraph Company at Chelmsford. On a number of occasions during the year transmissions were carried out from that station using as much as 15 kW., and regular concert programmes have also been sent. These transmissions were picked up as far away as St. John's, Newfoundland, a range of 2,673 miles, while ships 1,000 miles at sea also overheard the programmes. The successful linking up of wireless telephonic apparatus with the land line telephones was accomplished, and on August 19th, a successful connection was established between a subscriber's instrument in London and an aeroplane in flight on its way to Paris. Regular wireless telephonic transmissions have also been carried on from a Dutch Wireless Station.

The Imperial Wireless Telegraphy Committee, which was appointed on November 24th, 1919, by the Secretary of State for the Colonies "to prepare a complete scheme of Imperial wireless communications in the light of modern wireless science and Imperial needs," published its report in June. In this report they recommended the adoption of a scheme using thermionic valve apparatus at transmitting stations, with stages not exceeding 2,000 miles in length.

The Government of India formed an Indian Wireless Telegraph Board, with a view to extending and reorganising its existing telegraph system, in order to meet the strategic, political and commercial requirements of the Empire.

The Department of Scientific and Industrial Research established four sub-committees to assist the Radio Research Board. These were to deal respectively with the following branches of radio research: (a) the propagation of wireless waves; (b) atmospheric; (c) directional wireless; (d) thermionic valves.

As from January 10th of this year the Republic of Czechoslovakia adhered to the Telegraphic and Radiotelegraphic Conventions.

On January 14th a law was passed in Greece making the carrying of wireless apparatus obligatory on all Greek merchant ships of 1,600 tons gross and upwards, or having 50 or more persons aboard including crew. Certain modifications were also made in the rules and regulations governing wireless telegraphy in the British Mercantile Marine. As from

September 1st, 1920, automatic call apparatus may be installed subject to the approval of the Board of Trade. For voyages other than coastwise ones exceeding 48 hours from port to port, any vessel carrying 200 passengers or more must carry three operators. For voyages exceeding eight hours, but less than 48 hours from port to port, two operators must be carried. Regulations were also issued relative to the carrying of wireless telegraph watchers on board in place of one or more certificated wireless operators.

1921.

In January the foundation stone was laid of a new ultra-powerful wireless station at Sainte Assise, near Paris. Work on this station—known as the Paris Radio Central—has progressed rapidly, and the first portion of the work is now completed. This central station is to be divided into three sections, devoted respectively to Long-range Oversea communications, Continental routes in Europe, and special duplex services to London and Madrid. The latter services were inaugurated during the year, and are now in regular operation, the average working speed between London and Paris being about 80 words per minute in each direction.

Work has also progressed rapidly on the New York Radio Central Station on Long Island, and on November 5th, President Harding formally opened the first part of this station.

In Java the Dutch Colonial Authorities commenced the construction of a monster arc station to absorb up to 3,500 kilowatts, with which it is hoped to establish uninterrupted communication with Holland.

Experiments were carried out in France with successful results in the application of Baudot and similar high-speed telegraph apparatus to radio work.

On November 20th test messages transmitted from Carnarvon with a new valve transmitting plant were read in Australia, a distance of approximately 12,000 miles. Special press messages were also transmitted.

On December 18th, a demonstration of duplex wireless telephony between London and Amsterdam, Holland, was given by Marconi's Wireless Telegraph Company, Limited. For the purpose of the demonstration Marconi House, London, was linked by means of the ordinary trunk line with the wireless station at Southwold, and a similar arrangement was made in Holland between the wireless station at Zandvoort and the Amsterdam Stock Exchange. An unusually short wavelength was employed, giving immunity from interference from other stations.

The first station of the British Imperial Wireless Chain at Leafield, near Oxford, was formally opened on August 18th by the Postmaster-General. A 250 kW. arc set fitted at this station, which is ultimately to be employed for communication with a station at Cairo which is still in course of erection.

An International Wireless Conference was held in Paris in June, at which representatives from the leading nations discussed the regulation of the use of wireless and the allocation of certain wavelengths for various ranges and purposes.

An Imperial Conference was held in London during July and August to discuss improved communications within the British Empire. With regard to wireless communications it was agreed that steps be taken by H.M. Government for the erection of the remaining stations of the Imperial chain for which they are responsible, that the Governments of the Union of South Africa, of Australia and of India, should take similar action and that the Governments of Canada and New Zealand should co-operate. The Radio Research Board were also asked to investigate and report on the development and present position of Wireless Telephony.

La Compagnie Radio-France was constituted in June for the construction erection and working of radio stations in France for European and Transocean communication.

Two new Italian Wireless Companies were formed during the year, viz. :—Società Anonima Fiumana per le Radio Comunicazioni, and Società Italiana dei Servizi Radiotelegrafici e Radiotelefonici.

The Mullard Radio Valve Company, Limited, and C. F. Elwell, Limited, were also incorporated during the year, the former for the manufacture of thermionic valves and valve apparatus, and the latter for arc apparatus and installations.

The Radio Corporation of America effected agreements or amalgamations with the following firms to enable a pooling of all radio patents owned by them to be made :—The Westinghouse Electric and Manufacturing Company, The American General Electric Company, The International Radio Telegraph Company, the American Marconi Company, the American Telephone and Telegraph Company, and the United Fruit Company.

A merger was also effected between the Marconi Wireless Telegraph Company of Canada and the Canadian General Electric Company.

By agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., took over and agreed to operate for a period of twenty-five years the whole of the postal, telegraph and wireless services of Peru. Sir William Slingo, late Engineer-in-Chief of the British Post Office, has accepted the position of Chief of the Department. The Compagnie Générale de T.S.F. has also concluded a contract for a period of thirty years with the Government of Ecuador for the working of similar services in that State.

The progress made in amateur and experimental wireless is exemplified by the attempts made in February and December of this year to effect communication on short wavelengths between the wireless amateurs of America and Great Britain. The first attempt was unsuccessful, but during the second test, signals from many American amateur stations were heard both by British radio amateurs and by the representative of the American Radio Relay League, who was sent over during the tests. The signals were also heard in Holland.

The American Radio Relay League held its first Annual Convention in Chicago between August 30th and September 3rd, at which many thousands of U.S. radio amateurs were present.

(B) NATIONAL RÉSUMÉS OF THE TECHNICAL PROGRESS OF RADIOTELEGRAPHY AND RADIOTELEPHONY OF THE VARIOUS COUNTRIES OF THE WORLD DURING 1922

AUSTRALIA.

SINCE the last edition of the Year-Book, an epoch-making advance has taken place in Australian wireless services, which will in a few years place the Commonwealth in the front rank of wireless development.

At the Imperial Conference last year, the Commonwealth Government, through the Prime Minister, Mr. Hughes, undertook to establish without delay direct wireless communication between Australia and Great Britain.

In December, 1921, the subject was discussed by both Houses of Parliament in Melbourne, and all parties unanimously agreed to reject any scheme which did not provide for a service of the highest efficiency, for direct communication with Great Britain, and for the Australian station and organisation to be under Australian control.

A scheme was put forward for a combination of all the existing wireless services in Australia under joint ownership of the Commonwealth Government and Amalgamated Wireless (Australasia), Ltd., which had built up the complete wireless industry in Australia and had acquired the Australian rights, present and future, of the leading wireless systems of the world. Parliament approved of a draft agreement which had been laid on the table of the house, subject to investigation and modification if necessary, by a Committee of both Houses. This Committee, which had nine members, sat during January and February of 1922, and thoroughly examined all the details of the agreement, and of Australia's wireless requirements. It also considered the claims of the Radio Communication Company, which had submitted an alternative scheme to Parliament at the eleventh hour. The Government received a report signed by all members of the Committee (except one), recommending the Government to execute the agreement with the Amalgamated Wireless Company, with certain modifications indicated in the report.

The agreement is now in operation, the nominal capital of the Amalgamated Wireless, (Australasia), Ltd., has been increased to a total of £1,000,000 made up of 1,000,000 ordinary shares of £1 each. The Commonwealth Government has applied for and taken up 500,001 shares, and the whole of the remaining shares have been subscribed among the private shareholders. The Board of Directors is made up of three nominated by the Commonwealth Government, three elected by the private shareholders, and a seventh Director elected by a majority vote of the other six, or appointed by arbitration.

The Company has now taken over the whole of the coastal and commercial land stations in Australia, Papua, and in New Guinea, together with the entire staff of the Commonwealth Radio Service.

The Company is required, under the agreement with the Government, to proceed with the development of all branches of wireless communication, and its immediate programme comprises the following:—

- (1) To establish direct commercial communication between Australia and Great Britain.
- (2) To establish direct commercial communication between Australia and North America.
- (3) To establish a wireless feeder station in the capital city of every State to link with the high-power trans-ocean service.
- (4) To combine with the feeder services a re-equipped coastal service for improved communication with merchant ships around the coast of Australia.
- (5) To extend the manufacture of wireless apparatus in the Commonwealth.

Plans are being rapidly completed for the new stations, which will be equipped with the most modern types of apparatus, and will employ the electronic valve system. Arrangements are being made for extension of the Company's manufacturing plant to cope with the increased requirements of the Commonwealth.

The above-mentioned scheme is intended to be commercially self-sustained and profitable, but it is designed, at the same time, with the object of being employed for defensive purposes if at any time the Commonwealth should have need of defence. For the latter purpose it is essential to have the most efficient high-powered station that can be practically installed, and it is also essential that uninterrupted communication among the capitals of the various States be ensured. It is also essential that the Commonwealth should be in a position to manufacture the necessary equipment for its fixed land stations for naval and merchant ships, for aircraft, and for moving armies, and this involves the standardisation and production of electronic valve transmitters and receivers.

The trans-ocean service and the feeder services will be equipped for automatic high-speed transmission and reception and duplex operation, and it is also anticipated that in the near future some of the more important coast stations will be equipped with automatic apparatus for working traffic to and from merchant ships.

The Company has established departments for conducting the services listed below :—

- “ Trans-ocean Radio Service,” to provide commercial services with all parts of the world.
- “ Inland Radio Service,” for linking up isolated stations inland.
- “ Islands Radio Service,” for linking Australia with the surrounding islands.
- “ Coastal Radio Service,” for communication with merchant ships and for naval use.
- “ Marine Radio Service,” for conducting wireless services in merchant ships.
- “ Radio Concert Service,” to establish and carry on broadcast entertainment services.
- “ Radio Electric Works,” for the manufacture of all types of radio apparatus.

The conditions under which broadcasting will be conducted in Australia are not definitely settled at the time of writing, but the matter is being carefully considered, and the experience of Europe and America is being thoroughly examined. There is no doubt that broadcasting services will be particularly valuable to Australia. There are numerous other services that can be developed in Australia under the co-operative arrangement described above, because this arrangement has removed all barriers and left a clear field for the energetic development of all classes of wireless Communication.

E. T. FISK.

CANADA.

THERE are 4,695 radiotelegraphic stations in operation in Canada, their functions falling into the following categories :—

Coast Stations	..	..	..	..	..	..	..	36
Licensed Ship Stations	..	..	..	..	..	..	..	244
Licensed Public Commercial Stations—								
Radiotelegraph	..	..	..	..	..	..	..	6
Radiotelephone Broadcasting	..	..	..	..	..	..	..	53
Licensed Private Commercial Stations	..	..	..	..	..	..	..	28
Licensed Radiotelegraph Training Schools	..	..	..	..	..	..	..	17
Licensed Experimental Stations	..	..	..	..	..	..	..	40
Licensed Amateur Experimental Stations	..	..	..	..	..	..	..	4,258
Licensed Amateur Broadcasting Stations	..	..	..	..	..	..	..	2
Licensed Limited Coast Stations	..	..	..	..	..	..	..	1
Government Land Stations	..	..	..	..	..	..	..	1
Direction Finding Stations	..	..	..	..	..	..	..	4
Aircraft Ground Stations	..	..	..	..	..	..	..	5
Total	..	..	..	..	..	..	..	4,695

In the interests of economy the department has closed down several stations on the East and West Coasts.

The situation regarding the Hudson Bay chain of stations is unchanged, and the proposed commercial transpacific station for British Columbia is in abeyance for the time being.

Licenses have been issued for a chain of stations from Edmonton to Fort Norman, covering the Mackenzie River district, but up to the present construction has not been started.

An additional Direction Finding Station has been placed in operation at St. John, N.B., and, in common with the other Direction Finding Stations at Chebucto Head, Canso and Cape Race, is giving every satisfaction.

The Glace Bay-Louisburg stations continue to provide transatlantic service. In addition the Marconi Company have been granted a license for a coast station at this point to communicate with ships on 2,200 metres C.W.

Fifty-three broadcasting stations have been licensed. There is also a large increase in the number of amateur licenses issued, and this phase of wireless activity is assuming very large proportions. It is, perhaps, worthy of note that the majority of amateur transmitting stations have now adopted C.W. apparatus, and are keeping in touch with the various improvements and advances generally.

The Department has, pending revision of the Regulations, authorised the following wavelengths for amateur and experimental work :—

Amateur Experimental, Spark	..	..	..	..	180 metres.
"	"	C.W.	..	..	200 "
Experimental, Spark	..	..	..	..	180 "
"	"	C.W.	..	..	275 "

Any person, regardless of nationality, may now obtain a "reception only" license, and is not required to subscribe to the declaration of secrecy hitherto demanded. To facilitate the issue of these "reception only" licenses, arrangements have been made with the Post Office authorities for these licenses to be issued by the principal Post Offices throughout the country.

It has been found necessary to appoint local inspectors in each of the cities where activities have developed to the extent of requiring direct regulation and supervision.

The new Marconi C.W. stations at La Prairie and Glace Bay are now nearing completion, and, it is hoped, will be in operation before the end of the year. The La Prairie station will be operated direct from the Company's Head Office, St. Sacrament Street, Montreal, by a remote control system, and is intended to provide a high-speed wireless telegraph service with Glace Bay, the transmitting station for the transatlantic service. It is considered that this service, when completed, will prove to be the fastest telegraph service between Montreal and London.

The C.W. station, located at Louisburg, is now in operation. This station provides western ocean liners with approximately a 2,000 mile public telegraph and press service, and has materially improved the radio facilities between ship and shore.

The three stations situated in the vicinity of Glace Bay are operated from a central office by the remote control system. This arrangement is extremely efficient, and has since been applied to other long distance services.

Considerable work has been done in effecting telegraphic and telephonic communication between the different lumber camps with each other and their respective air fleets; also much preliminary spade work has been accomplished in inter-train communication, the effect of which will be apparent in the near future.

Broadcasting has developed to a remarkable extent, so that numerous radio firms have been started, thus :—Toronto has 12 broadcasting stations authorised, Montreal 7, Calgary 4. The wavelength for broadcasting is restricted from 400 to 450 metres, with steps of 10, and special hours of operating are assigned to each station. The power input of the largest stations is about 2 kilowatts. As in the United States, the programmes are published in the daily papers.

A. S. EVE,

Director of Physics of the McGill University, Montreal.

CHINA

FROM the purely technical point of view, no great progress in wireless telegraphy took place during the year 1922. Recent developments in this great country have moved rather on the lines of building up an organisation to operate the existing wireless stations.

The present Government only came into power towards the middle of 1922, and naturally they require time to cope with the problems arising out of such a new science as wireless telegraphy. Like all the Chinese, they leave the most difficult problems until minor ones have been smoothed away; nevertheless, the Chinese Wireless Telegraphy Company—a joint concern of the Chinese Government and Marconi's Wireless Telegraph Co., Ltd., of London—continues its consulting and educational work, and, notwithstanding the many difficulties met with, it has already become firmly established in the commercial field. It goes without saying that its activities will considerably increase once the regulations, now about to be put into force by the Chinese Government requiring all Chinese ships above a certain tonnage to carry wireless apparatus, come into force. This is another indication of China's effort to bring the commercial undertakings of her country into line with those of western countries.

In order to facilitate the maintenance of the increasing number of ships using wireless in the East, the Marconi International Marine Communication Company, Limited, has established a service and maintenance depot at Hong Kong which, in conjunction with similar facilities offered at Shanghai by the depot of the Chinese National Wireless Telegraph Company, constitutes another important link in the universal chain of depots established and maintained by the various associated Marconi Companies. Until the year 1922, vessels in the China trade fitted with wireless apparatus worked at considerable disadvantage owing to the absence of wireless depots, but their requirements can now be met at the above depots whether they require complete sets or merely need repairs to existing equipments.

A training school for Chinese wireless telegraph operators is to be opened during 1923 either at Hong Kong or at Shanghai.

During the summer of 1922, the 25 kW. arc station at Urumsti (Eastern Turkestan) was completed and this station has been in direct communication with several stations in India. The transportation of material for this station and its construction represents quite an important event inasmuch as it links together India and China.

A 25 kW. arc station is now under construction at Kashgar and should be completed about the middle of 1923. This station is intended to communicate with Urumsti, but it will also be capable of carrying on communication with stations in Russia and India as well.

The 25 kW. station erected at Urga, the capital of Mongolia, is not at present working owing to the unsettled state of the country, but it is expected that this station will resume work during 1923. When this has been done and when the station at Kashgar is completed, the Government at Peking will be in direct communication with the three great northern trading centres for the interior of North-West China.

The National Research and Testing Laboratory inaugurated by the Board of Communication has now been completed. It will be run by the six students who passed through a two years' course of instruction at the Marconi College at Chelmsford.

The Wireless Telephone Signal Corps which was formed by the Board of War in 1919, still continues to render great service to the Chinese Army. The entire Corps is under the control of Chinese officers and the apparatus is worked by Chinese soldiers.

The erection of new stations at Harbin, Peking and Canton, is under consideration and a large trans-Pacific station is contemplated for Shanghai. These stations are to be erected by the Federal Wireless Telegraph Co. of America, and they will be under the control of the Board of Communications at Peking.

There is no doubt that a big field for wireless in China will be open in the near future. Those students who have studied abroad are now beginning to put into practice the ideas they have absorbed in western countries. As time goes on and more and more of such men get into power, the use of wireless in China is assured of considerable expansion.

F. E. ROBINSON.

FRANCE

DURING the year 1922 great progress has been made in the construction of high frequency generating apparatus. The machines actually delivered by the Société Française Radio-Électrique during 1922 have reached an efficiency unknown heretofore in the domain of high frequency alternators; taking into account *all* mechanical and electrical losses in the alternator as well as in the auxiliary apparatus for cooling, etc., the real efficiency of a 250 kW. 20,000 cycle alternator lies between 78 and 80 per cent. and of a 500 kW. 15,000 cycle alternator between 83 and 85 per cent. We do not think that such high efficiencies have been obtained elsewhere.

The author has, on the other hand, developed for very high frequencies a frequency multiplier which does not require direct current for saturation and is able to compete directly with the three-electrode valve, even in the case of the very shortest wavelengths.

From such a multiplier, coupled with a 33,300 cycle alternator at 6,000 r.p.m., either 100,000 cycles (trebling), with an efficiency of 85 per cent., or 166,000 cycles (quintupling), with an efficiency of 75 per cent., can be obtained, all losses in auxiliaries such as condensers and induction coils being taken into account. One of the original features of this multiplier is the use in its magnetic circuit of an iron-nickel-manganese alloy of special composition having a very high resistivity and reaching saturation at very low induction.

The power per unit volume is very high; the magnetic circuit of a 15 kW. 100,000 cycle multiplier weighs about one pound.

The speed regulation of high frequency alternators, so important for the success of this multiplier in the case of very high frequencies, has been fortunately improved recently to such an extent (by M. Bethenod and M. Chireix) that alternators will soon be placed on the market with constancy of speed within 1/10,000.

Radiotelephonic transmission, using this multiplier on 1,800 or 3,000 metre waves, have already been begun.

The "balanced multiple earth" antenna of the transmitting station of St. Assize, designed according to the author's B.P. 132,101, has given remarkable results. It has been possible by this construction to obtain an antenna circuit of a *total* resistance of only 0.45 to 0.5 ohm. for a radiation resistance of 0.2 ohm. The multiple descents from the aerial to the earth suggested by Marconi and Alexanderson are thus shown not to be indispensable for obtaining a low resistance antenna circuit. The main factor is the balancing of the currents in the different earth connections as is now standard practice in France.

The connections utilised for wireless telephony with valve sets continue to be in France essentially those of the "choke coil" type. As is known, this method* consists in feeding through a choke coil a modulating valve from the same high tension source as the oscillating valve. An improvement, however, has been realised by going back to the original idea* of using instead of a mere choke coil a transformer with two windings through which flow respectively the currents of the oscillating valve and of the modulating valve, which windings can be connected in opposition to each other to avoid the magnetisation of the transformer and thus permit of a design without an air gap or with a very small air gap. The modulation, according to experiments of M. Bégin, is then better.

* See Latour French Patent No. 21855/512295, of 1916.

In the direction of commercial exploitation of wireless telephony, experiments have been started on a method for carrying on secret telephonic communications.

Prof. Henri Abraham has carried on some interesting experiments on a method of duplex telegraphy, utilising three different wavelengths, a method which is particularly applicable to Poulsen arc stations.

Wired wireless has been applied by the writer successfully to the first European 120,000 volts transmission line between Saint Etienne and Beaumont. Reception is perfectly silent at all times and the articulation is excellent. The telephonic transmitting and receiving sets are linked to the power line by condensers in such a manner that wireless disturbances, including atmospherics, are eliminated.

In the use of two electrode valves as rectifiers it has been possible by using special connections to obtain very easily and comparatively cheaply 200,000 volt. direct current from ordinary low voltage city lines with a 100,000 volt transformer, the heating of the filaments of the rectifying valves being done in a special way by the alternating current*.

MARIUS LATOUR.

GERMANY.

DURING the last year radiotelegraphy has made special progress for commercial purposes. The transatlantic wireless exchange has increased up to more than one million words per month, with a maximum of 50,000 words per day at the Nauen station, and the number of words which are exchanged by this station on the four European lines is just as large. That means that a great percentage of the whole foreign communication is operated by the high power wireless stations in Germany. The wireless communication has been greatly facilitated by the centralisation of the transmitter and receiver of the high power station Nauen right into the centre of Berlin.

In order to keep pace with the continually increasing demands, the Nauen station is being enlarged, so that by next spring several new aerials and transmitters can be set to work, but only partly with maximum energy. By this enlargement the maximum transmitter energy will be three times as great with an aerial voltage of 120,000 to 150,000 volts; a greatly increased efficiency. Nauen will then possess four large transmitters, each with a complete set of generators of 200 to 400 kW. for simultaneous communication with North and South America, and besides these, four small transmitters for European communication, which are provided with energy by valves or by suitable tapplings from the large generator.

The long distance receiving plant at Geltow, which is connected to the central station in Berlin by a cable of 30 km length, has in the meantime also been enlarged. Geltow now possesses a large receiving room of four by seven metres, in which eight frame aerials, each with an area of two to ten metres, are set up, in addition to which there are two frame aerials outside, close to the building. In spite of the aerials being so close together they all work perfectly without disturbing one another. The receiving apparatus are mostly arranged in boxes directly under the aerials and these boxes are iron-clad in several iron plates. About 50 metres off there is another frame aerial with an area of 16 square metres in a special building, and this aerial is suspended three metres from the ground in order to diminish the influence of the ground. Just under the aerial is the receiving and apparatus room, which is protected by four layers of iron plates, so that the receiver cannot be directly influenced by transmitters and atmospherics.

When the atmospheric conditions are particularly bad Geltow now uses a double Bellini-Tosi-Goniometer system. The two loop systems are about 2 km. apart and connected to the receiving frame aerial by ordinary post-cables.

* See Latour British Patent No. 131,697.

Telegrams are now mostly written by typewriter at the central station, and the high speed telegrams by a high speed Morse recorder, and soon the whole high speed telegraphy will be operated by Siemens' type printing high speed telegraphic apparatus. Experiments made last year with the Siemens writer between London and Berlin proved the great advantages of this arrangement.

As it has been observed that the atmospheric conditions very often differ even at a distance of 200 km. and therefore the atmospherics also, research was made in Germany with good results. Experiments for receiving American signals were made from June till September on the Sylt Island, which lies on the North Sea coast off Schleswig Holstein, about 400 km. from Berlin, and these experiments showed that the signals there were five times as loud as in Berlin. An observation of special importance was that the atmospherics, which on the whole were less at Sylt, were at the same time strongly directed east or south, which is very favourable for receiving American signals. As this special direction of the atmospherics was not observed in Berlin another receiving arrangement at Sylt is now projected and the incoming signals are to be transferred from there to Berlin by means of a wireless transmitter (relay).

Good results were also obtained last year with all the different arrangements of the wireless post-lines of the German Empire (Reichsfunknetz). Also in this case the joining of the transmitters and receivers in a central station at the central telegraph office in Berlin proved satisfactory. The "Blitzfunk" was specially successful, as all long-distance telephone and telegraph lines in Germany are over-burdened and therefore disturbances occur. As every Blitzfunk telegram, even to the most distant spot possible in Germany, is delivered to the receiver in 10 to 15 minutes, or the message telephoned from the nearest post office, this organisation has become indispensable for the commercial world, as an ordinary wire telegram takes from four to eight hours. At the same time the Blitzfunk is a great source of income for the postal authorities, because such a telegram costs 50 to 100 times as much as an ordinary one. These high prices are to prevent this new arrangement from being over-burdened and thus losing its speed.

The new broadcasting arrangements develop just as slowly in Germany as in England, because the mistakes made in America are being avoided. The Government for the time being superintends the development. Great difficulties have up till now occurred in deciding the best way to allow the different wireless firms to partake in the new arrangements. There are further difficulties because nearly all the patents on modern wireless transmitters and receivers are taken out by one firm, Telefunken.

On the other hand, the wireless telephone transmission of messages by the "Eildienst-Gesellschaft m.b.H." was very successful. Since September 1st, 1922, a continuous wireless telephone service has been maintained every day from 8 a.m. till 6 p.m., on a wavelength of 4,000 metres, by the 10-kW. Telefunken valve transmitter of the Königswusterhausen station, about 30 km. from Berlin; the transmitter is operated from Berlin. Messages chiefly concern the rate of exchange in Berlin, London, Paris, New York as well as the "Weltmarkt" prices of the most important raw materials. As aërials, small L. and T. antennæ five to ten metres above the roofs are used. The receivers consist of a simple audion with coupling reaction and secondary circuit, or for a distance of more than 300 km., a two-valve audio frequency amplifier. These receiving apparatus are so constructed that they can be connected straight to the wires of a central station of 110 or 220 volts. There are also other apparatus which can be used when the voltage of the system is alternating. In this case the alternating voltage is rectified by means of a small oxide cathode rectifier, and the noise of the wire system is subdued by special "Kettenleiter." The price for the loan of a receiving apparatus is 30,000 Marks a month. Although the expenses are large this arrangement has become very important, because the commercial world in this way gets quick and sure

statements and is not influenced by unreliable messages about the exchange. In spite of the "Eildienst Gesellschaft" only being in existence a short time there are already about 1,000 subscribers. On account of the sudden rise and fall of currency and prices, every merchant and farmer is obliged to get information about the continual varying of prices. In order that the information of the "Eildienst Gesellschaft" cannot be misused, they are coded and every week a new code is sent to the subscribers.

Vacuum valve technics made great progress during last year. After long years of trial it is now possible to fabricate valves with oxide filaments which have a life of 10,000 hours and only need one-tenth of the energy that has until now been necessary for heating the filament. Besides these others have been constructed which also need less filament current; these valves contain a new kind of specially prepared metal filament, and have the advantage that no noise is emanated from the filament. This type is especially adapted to radio frequency amplifiers. The valve transmitters have been improved in such a way that the anode voltage can be raised to 10,000-20,000 volts, and that in addition the noises of the transmitter are diminished when alternating voltage is used for the anode. This improvement was attained by a bridge connection, and the compensation of the voltage variations in signalling by a choking coil in the generator connection, and this choking coil is controlled by the anode current. Valve transmitters for a wavelength of 2,000 metres were introduced on German ships; on transmitters having an aerial output of 1 kW. and a range of about 4,500 km.

DR. ING. A. MEISSNER.

GREAT BRITAIN.

THE year under review has been specially noteworthy for the remarkable awakening of the interest of the general public in wireless, and its possibilities rather than for the announcement of any marked discovery in the science. This has been strikingly illustrated by the urgent requests for the public broadcasting of music and news by wireless telephone. The wave of enthusiasm for that fascinating instrument—the wireless telephone—has arrived here somewhat later than in America, and the officials of the British Post Office, who are responsible for the regulation of wireless traffic, and who, therefore, have had to deal with all the questions raised by the introduction of broadcasting, have been able to profit by the unfortunate experience of America, where lack of suitable legislation in the matter of wavelengths and times of transmission has caused much avoidable interference.

The whole question of the broadcasting of wireless telephony was finally referred to the Wireless Sub-Committee of the Imperial Communications Committee, and their recommendations were accepted by the Government. Permission to conduct the broadcasting service is to be given to British firms who are *bona fide* manufacturers of wireless apparatus. The revenue for providing the services is to be derived partly from a contribution by the manufacturers to the broadcasting company for each set sold by them, and partly by a proportion of the annual license fee paid by the public to the Post Office.

The Government has further considered the question of the Imperial Wireless Chain, and have ultimately decided to build in England a station of the power suggested by the expert commission, instead of the station of smaller power proposed in the first instance. It has been suggested that this station, which is to be the most powerful one in Great Britain, should be erected at Bourne, near Spalding, Lincolnshire, with a connected receiving station at Banbury. The aerial is to be 800 ft. high, and the set (thermionic valves) powerful enough to transmit to Poona, Johannesburg, and Perth (Australia).

In the research world experimental and theoretical work on triodes is still proceeding, and, in particular, attention is being paid to those phenomena which are dependent on the fact that triode conductances are not constant. As an example a recent paper by Turner and Moullin* may be cited in which an exhaustive experimental study of the triode as rectifier is described. A mathematical theory which takes into account the curvature of the triode characteristics will no doubt be difficult to work out completely, but it is only by such a development that we shall be able to interpret and explain satisfactorily the action of even the commonest of triode circuits. Thus many writers, both in England and in Germany, have attempted to discuss, in terms of a linear theory, the irreversible changes of phase and frequency which cause so much trouble in triode generators with coupled circuits, and it is only within the last year that a satisfactory non-linear theory has been given by Van der Pol.†

Remarkable possibilities have been opened by some pioneer work on short wave directional wireless begun by Senatore Marconi in 1916, and continued recently by C. S. Franklin.‡ The former used short damped waves of two or three metres, while the latter has concentrated on the use of continuous waves of about 15 metres obtained by means of thermionic valve transmitters. Large reflectors were used, which, besides giving marked directional effects, made wireless telephony carried out with the same wavelength almost distortionless. With the use of reflectors of dimensions large compared with the wavelength the directional effect is very marked, so that the possibility of a wireless "lighthouse" with a revolving beam is definitely established.

E. V. APPLETON, M.A., D.Sc.
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HOLLAND:

THE hope expressed in the 1922 issue of this Year-Book, viz., that the high-power transmitting station in Holland destined to communicate with the East Indian colonies would soon be completed, has not yet been fulfilled. Though the work approaches its completion, the first experimental signals have not yet been transmitted. The first tests, however, will take place at the end of 1922, and they will show whether a commercial regular wireless traffic over a distance of 1,200 km. belongs to the realm of present technical possibilities. Unfortunately the physical aspects of long distance transmission are only known to such a small extent that a definite calculation of the power required to cover distances comparable with the earth's radius cannot be made yet. Much has been written about the "absorption" by the atmosphere, limiting wireless transmission; however, direct analysis leads undoubtedly to the conclusion that, were the atmosphere not there, wireless signals from even the most powerful modern station would only carry a few thousand km. at the most. Hence it may be said without exaggeration that the presence of the atmosphere is as beneficial to wireless transmission as the presence of iron is to the whole of electrical engineering.

An interesting contribution to the problem of the field round a transmitting antenna was recently made by Professor Elias, in a paper which appeared in the *Tydschrift van het Nederlandsch Radio-Genootschap*, Vol. I, pp. 177. It is pointed out there, on the basis of the Maxwellian equations, that it is difficult, if not impossible, to define exactly the capacity and inductance of an aerial, both functions belonging to the domain of quasi-stationary problems only. Further, the very difficult problem of the field inside a finitely conducting earth is treated, and a new formula for the earth resistance of a vertical antenna is derived, while the transmission theory of Sommerfeld is further extended.

* Proc. I.E.E., March, 1922.

† Phil. Mag., April, 1922.

‡ Proc. I.E.E., May 3rd, 1922

Important experiments were carried out jointly by the Nederlandsche-Seintoestellen-Fabriek and the Marconi Co. in relation to wireless telephone transmission between Holland and England with a wavelength as short as 100 metres. The relative immunity of this wavelength compared with longer ones from atmospheric disturbances was again verified.

The ratio of signal intensity to disturbance intensity for various circuits forms the subject matter of a theoretical thesis presented to the Utrecht University by Mr. A. Koerts. Following up a method due to Heaviside the writer proves theoretically that many of the proposed differential circuits cannot be effective in materially improving this ratio, this fact being due to the free antenna oscillations occurring during a forced disturbance. Best results may be expected from a combination of coils or open antennæ, together with damping reduction.

Finally mention must be made of a very important Dutch improvement in the manufacturing of high power transmission triodes. Phillips' Glowlamp Works have succeeded in constructing triodes of the order of 100 kW. output each. In the usual construction the main difficulty consists, as is well known, in the cooling of the anode. This difficulty has been completely surmounted, and hence this invention brings about a simplification in the construction of wireless telegraph and telephone transmitters, the magnitude of which it is difficult to over-estimate.

BALTH. VAN DER POL, JUN. D.Sc.,

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ITALY

DURING the above year radiotelegraphy and radiotelephony in Italy underwent a period of intense preparation pending the carrying out of numerous services concerning international radio communication, the whole of which is to be handed over by license to private industry. Experiments were conducted to decide on the best wireless system, and for this purpose the Italian Marconi Company in Rome last winter installed at the "Storta," a barren country place situated a few kilometres from Rome, a complete receiving wireless telegraph station which was fitted with the most up to date apparatus, all of which was manufactured at the Marconi Works at Genoa. The above installation was the receiving station of a high power transmitter, and was supplied with two directional aerials perpendicularly connected, through a direction finder, to the filter Marconi-Mathieu receiving apparatus, allowing thus directional reception free from atmospheric disturbances. The station received steadily very clear signals from all the North American stations, and it is safe to say that the experiment was highly successful since receptions took place quite continuously from the middle of February to the middle of April. The identical telegrams received were forwarded daily to the Italian Premier's Office, and all the Italian authorities and Press representatives had the opportunity of seeing the efficiency of the working of the station.

The above receiving apparatus were afterwards cleverly reproduced at the Genoa Marconi Works and shown on actual public service with America at the Milan Fair. The same apparatus were employed by the Italian Navy at the wireless station of the Genoa Peace Conference and at the Navy Italian of Monte Rotondo, which is the receiving station of S. Paolo (Rome).

Last year witnessed the 25th anniversary of Marconi's invention, and the writer held for the occasion at the Milan "Associazione Elettrotecnica Italiana" a lecture in which a résumé was given of the work of Guglielmo Marconi from the Pontecchio (Bologna) experiments, which were carried out over a distance of 200 metres, up to the last experiments with Australia, covering a distance of 12,000 miles.

In view of the good results given by the receiving apparatus constructed at the Genoa works, above referred to, Senatore Marconi decided that such sets should be installed on his yacht "Eletra," before sailing for his last summer cruise between England and America.

During the past year some agreements have been established between the Marconi Office of Rome and the Northern Italy Electrical Industry Federation, with a view of giving practical assistance to "wired wireless."

The Marconi Works in Genoa, which are always striving to perfect their products, have succeeded in producing thermionic valves of various powers, which can easily stand on test with the best foreign made valves.

Ship sets have continued their development, among which is to be mentioned that installed on board the ss. "Conte Rosso," a huge transatlantic steamship, belonging to the "Lloyd Sabaudo," whose 1.5 Kw. wireless transmitter has sent ocean communications as far as 3,500 km. This installation was a real success in every respect; it can be taken as a model for installations of the kind. In fact, following the good results given by the "Conte Rosso" wireless installation, many Italian shipowners have decided to adopt this type of set on board their liners.

The Italian Wireless Company (Societa Italiana Servizi Radiotelegrafici e Radiotelefonici), called the SISERT, founded by Senatore Marconi, having reached its full development, is in a position now to undertake any kind of wireless concession. The SISERT, in agreement with the "Societa Anonima Fiumana per le Radiocomunicazioni," her associated company, has carried through the preparatory work for a wireless station to be installed in Fiume and destined to link this city with the nearest European capitals and ships at sea.

The SISERT has also introduced recently in the State of Albania the Marconi wireless system. An agreement was signed between the Albanian Government and the SISERT, in which is contemplated the erection of a wireless station in Tirana to connect this city with the European wireless network, besides the erection of two stations for local service. A demonstration of the efficiency of the Marconi's Wireless Telephone Service in the centre of a big town, viz., under the worst conditions, has been made in Milan at the Chamber of Commerce in the presence of the delegates of the most important industrial companies, bankers and press.

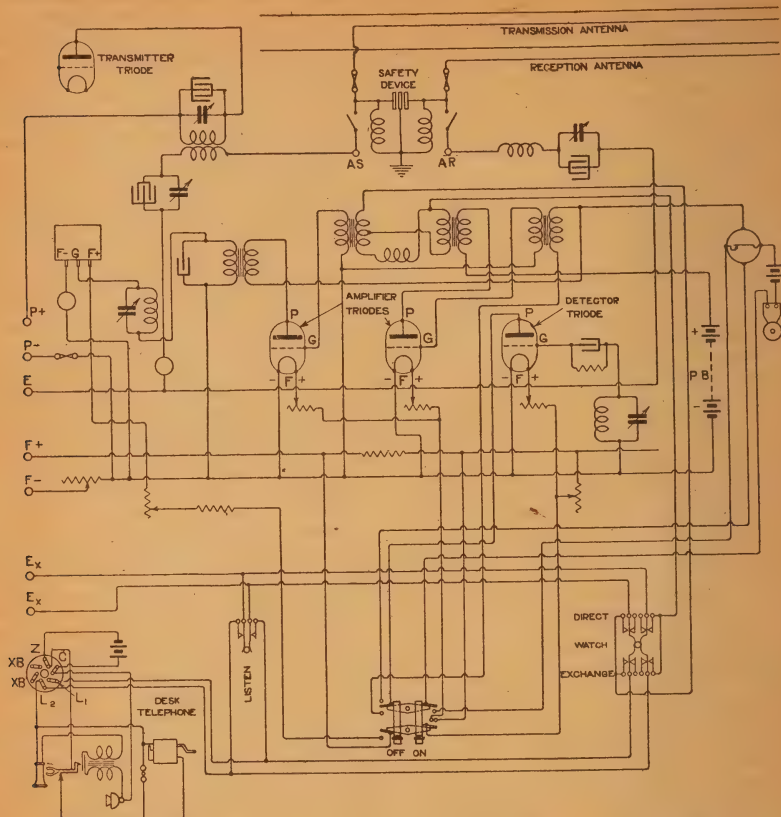
MARQUIS L. SOLARI.

JAPAN.

THE technical progress in connection with radio in Japan for the period 1921-1922 is merely the continuation of the works in the last period, namely, (1) high frequency telephony over power transmission lines and (2) radio telephony of short distance communication.

The experiment of high frequency telephony over the transmission lines of the Ujigawa Electric Company which was referred to in the résumé of 1922, was carried out with success, and the system is still under test on actual working conditions of the transmission line.

The telephone apparatus have been installed at the power station and the sub-station. The transmission line is 34 kilometres in length and carries 55,000 volts, three-phase.



The transmission lines are coupled at both power station and sub-station ends to two short horizontal antennæ, one for transmission and the other for reception, arranged in parallel below the transmission lines at a distance of two or three metres. The most efficient length for these horizontal antennæ has been found to be about 400 metres, though it may be shortened, if required, up to that of one span of transmission towers. The sending wavelengths in use are 1,700 metres for the power station and 1,000 metres for the sub-station.

Though the transmitter triodes are of 50 watts input rating, 20 watts power is sufficient for simultaneous two-way conversation and 30 watts or a little more for reliable working of the call apparatus. The plate current of the detector triode, which passes the signalling relay of the call apparatus, is 1.5 to 2.0 milliamperes, and keeps the tongue of the relay in the normal position. When signalling current is sent from the transmitting station, the plate current decreases about 50 per cent., and the relay works, resulting in the bell ringing. The plate voltage of the transmitter triode is 1,200, its current ranging from 40 to 50 milliamperes and the antenna current remains at 500-600 milliamperes.

Under the above named conditions conversation is so easy and clear that with desk telephones attached to the apparatus, one party at the power station end experiences no difficulty in receiving the other's voice, even in the midst of the troublesome noise from the rotating machinery.

In comparison with ordinary battery telephony which the Company previously used, nobody can deny the superior advantages of the high frequency system now installed in that the latter is perfectly free from the annoying disturbances caused by low frequency induction from the transmission lines, always experienced with the former system and the improvement in conversation is much appreciated by the staff.

Furthermore, the method of high frequency telephony works very satisfactorily connected to the battery telephone lines.

The accompanying diagram shows the complete internal wiring of the set.

It is regrettable that unavoidable circumstance delayed the commencement of the tests of radio telephony between Awomori and Hakodate and between Japan proper and Korea, which were also referred to in the last résumé (1922), and no descriptions thereof are included in this article.

EITARO YOKOYAMA,

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NEW ZEALAND.

UP to the time of going to press, there has been practically no official alteration in wireless communication in this dominion.

The Government is considering the question of re-equipping one or more of its existing land stations with continuous wave apparatus, particularly for the purpose of improving communication between New Zealand and Samoa.

The question of Imperial Wireless communication has also been discussed, and the Postmaster-General was reported to have stated quite recently, that the Government favours direct communication between New Zealand and Great Britain, instead of communication through a chain of relay stations.

The importance of broadcasting and its value in the isolated parts of New Zealand are clearly recognised, and the subject has been discussed between the Government and the principal manufacturers of wireless apparatus. At the time of writing, the conditions under which broadcasting will be permitted remain unsettled, but it is anticipated that they will be clearly defined by the beginning of 1923. In the meantime, some importing firms have purchased apparatus abroad, apparently without knowing whether it will be suitable for the New Zealand Regulations, and probably without taking due precautions in the important matter of patent rights.

There is no doubt that all of the above mentioned questions will be definitely settled during the year 1923, and New Zealand will then enter a much wider field of wireless development.

E. T. FISK.

UNITED STATES OF AMERICA.

I.—LONG DISTANCE COMMUNICATION.

TWO new transatlantic radiotelegraph transmitting stations have been opened by the Radio Corporation of America, namely, New York Radio Central, located on Long Island, and Tuckerton, New Jersey. Each of these operate with 200 kilowatt Alexanderson alternators. The construction of the Warsaw, Poland transatlantic station by the Radio Corporation is under way, this being similarly equipped to the New York Radio Central.

Reception of the various European commercial stations in the United States by the Radio Corporation is now accomplished on an improved system embodying the following elements:—

(a) The use of the Beverage-Rice "wave antenna," with its highly directional characteristic, for the reduction of atmospheric disturbances.

(b) The transfer of the received signals over private wire lines from the receiving stations to the centre of the commercial district, the wire line transfer being, in general, duplex.

(c) The use of Ink Recorders for all reception.

The development of the Ink Recorder by Messrs. Blakeney, Weinberger, and Miller has resulted in the availability of this instrument for steady commercial service. Operating speeds of sixty or eighty words per minute on the transatlantic circuits are increasingly usual.

2.—SHORT DISTANCE COMMUNICATION, AND APPARATUS.

Dr. G. Bush and Mr. C. G. Smith have devised a form of cold-electrode rectifier for high voltages, based on gaseous conduction and the use of an auxiliary magnetic field which imparts the necessary unilateral conductivity to the ionised gas paths. The device is in use as a rectifier in radio telephone transmitters fed from alternating current sources.

Professor W. G. Cady has developed a number of interesting applications of the Piezo-electric qualities of crystals to the radio field, notably as wave-meters, frequency stabilisers, and the like.

The use of magnetic modulators for short wave radio telephony has been developed by Messrs. Weinberger and Amy, and by the General Electric Company. These devices have enabled the ready conversion of continuous wave telegraph sets into telephone transmitters as well.

The piloting of vessels through tortuous channels, or in times of fog, by means of submarine cables carrying alternating currents has received considerable attention on the part of the United States Navy.

The experimental application of radio telephony to the marine field, with particular reference to universal service from all wire telephone subscribers to ships at sea, has been carried forward vigorously. The steamship "America," equipped with a General Electric Company's duplex radio telephone and telegraph outfit by the Radio Corporation, carried on tests with the Deal Beach Station of the American Telephone and Telegraph Company, equipped with similar apparatus of the Western Electric Company. It proved possible to connect widely scattered subscribers to the wire telephone service to persons on board the ship, even when the "America" was more than four hundred miles away from land.

3.—BROADCAST RADIO TELEPHONY.

Broadcast radio telephony has developed at an amazingly rapid rate during the last year. Nearly two hundred broadcasting transmitting stations are now in more or less continuous operation. It has been estimated that the number of broadcast listeners is approaching the million mark. The transmitting stations run from a few watts to as much as twenty kilowatts in the antenna.

This tremendous vogue of broadcast telephony has emphasised the need for governmental regulation, and accordingly a Radio Telephony Conference was called to formulate regulations for this field. The Conference recommended that amateur stations be permitted within the wavelength band from 150 to 275 metres, private broadcast from 285 to 485 metres, and Governmental and public broadcasting from 1,050 to 1,500 metres. A number of detailed regulations as to power, range, character of service of transmitters, and the status of the oscillating receiver were adopted. The regulations will be put into force on the passage of appropriate enabling legislation.

The demand for radio apparatus has brought about the formation of a considerable number of new concerns. Some idea of the demand can be gained from the fact that during 1921, a monthly production of 5,000 vacuum tubes resulted in a surplus, whereas in 1922, a monthly production of nearly 300,000 tubes per month still leaves a shortage along certain lines.

ALFRED N. GOLDSMITH, Ph.D.,

Editor of the "Proceedings of the Institute of Radio Engineers."

NATIONAL AND INTERNATIONAL WIRELESS LAWS & REGULATIONS

(A) Résumé of Wireless Telegraphic and
Telephonic Legislation.

(B) The International Radiotelegraphic Con-
vention.

(C) Text of International Convention on
Safety of Life at Sea. (Wireless
Abstract.)

(D) Wireless Laws and Regulations of
the Countries of the World.

RÉSUMÉ OF INTERNATIONAL WIRELESS TELEGRAPHIC AND TELEPHONIC LEGISLATION

LEGISLATION relating to Wireless Telegraphy does not date back further than the year 1903, although four years earlier (in 1899) the Marconi system had reached a point of development sufficiently advanced for the British Admiralty to think it desirable to obtain sets of apparatus for trial, and two years later (in 1901) an agreement of a limited nature was entered into between the Admiralty and the Company for the supply of Marconi apparatus. In July, 1903, a further and more complete agreement was concluded. At that time the increasing use of Wireless Telegraphy for maritime purposes throughout the world had raised questions of international interest, and circumstances had clearly demonstrated that international agreement was desirable with regard to many points dealing with the interchange of messages through the newly established medium.

A conference met at Berlin in August, 1903, on the invitation of the German Government. As a result of that conference all the Powers, with the exception of Great Britain and Italy, agreed to certain proposals, to be considered at a subsequent conference, for the international regulation of Wireless Telegraphy.

The Wireless Telegraphy Act, which was passed in 1904 for two years only, and which was renewed in 1906 without modification (and is still in force), prohibits the installation or working of wireless telegraph apparatus in the United Kingdom, or on board British ships, except under license from the Postmaster-General. Its principal objects were, by means of systematic regulations, to make Wireless Telegraphy more useful for purposes of defence and general communication. The memorandum which was laid before the House of Commons in explanation of the Bill stated that the necessity for legislation depended, firstly, on the importance from the naval point of view of giving the Government control over wireless stations in time of war or emergency; and, secondly, on the desirability of placing the Government in such a position as to have the power of entering into an agreement on the subject with other countries if it should be found expedient to do so.

In October, 1906, a second International Conference was held in Berlin, and its primary objects may be classified under the following headings:—
(1) The acceptance and transmission of telegrams. (2) The adoption of rules of working. (3) The provision of means of collecting charges and settling accounts between the different countries. (4) Arrangements for the publication of all information necessary for inter-communication. (5) Rules to prevent interference and confusion in working, with adequate provisions for enforcement. (6) Provision that, with certain exceptions, inter-communication must not be refused on account of the differences in the systems of Wireless Telegraphy employed.

The documents signed at Berlin on November 3rd, 1906, consisted of :— (a) The Convention ; (b) the Additional Undertaking ; (c) the Final Protocol ; (d) the Service Regulations. These documents were revised at the London Convention held in 1912, and the Radiotelegraphic Convention which came into operation on July 1st, 1913 is printed *in extenso* in the following pages. About 40 per cent. of the delegates present at the last conference were administrative, executive, or technical officials, acting for the postal telegraph and cable departments of the various countries represented. About another third of the assembly (37 per cent.) were composed of army and navy officers the relative ratio of naval and military officers being about 4 to 3. About 6 per cent. of the delegates were trained and experienced diplomats, and the remainder included eminent scientists, noted meteorologists, and prominent personages interested in the technical, commercial, and humanitarian development of wireless telegraphy.

The signing of the International Convention for the Safety of Life at Sea on January 20th, 1914, constituted a most noteworthy advance in the legislation relating to Wireless Telegraphy. The Convention was drawn up by an International Conference which met in London on November 12th, 1913, and laid down, *inter alia*, the minimum Wireless Telegraphy equipment to be carried by ships of different grades. For the purpose of defining the hours of service (*i.e.*, setting out the times when the various stations are to open for the receipt and transmission of messages) the Radiotelegraphic Convention, 1912, divided ship stations into three classes, but did not specify which vessels (by virtue of the services maintained on board) should be placed in the various classes. Under the provisions of the Safety of Life at Sea Convention which deal with Wireless Telegraphy, these classes are clearly defined.

In order to give effect to this International Convention, the British Government has amended the laws relating to merchant ships. These laws are printed *in extenso* under "*Great Britain*" in the "*Laws and Regulations*" section of this book.

At the outbreak of the late war immediate steps were taken by the Governments of the belligerent countries to bring the use of Wireless Telegraphy under direct official control, and all stations not operated under Government supervision were ordered by the respective Governments to be dismantled.

This action, as might well have been expected, did not stop at the belligerent countries, but extended to neutral Governments almost all over the world. It was necessary that steps should be taken by non-belligerent powers to ensure that their neutrality obligations were not violated by the utilisation of wireless stations in their territory for the transmission of communications of a non-neutral character. Consequently, almost all countries throughout the world issued special regulations relating to the use of Wireless Telegraphy in war time. Most of these wartime measures have now been repealed, but such as remain in force will be found printed in the section of this book devoted to the Laws and Regulations of the World.

The central agency established for the purpose of collecting and distributing information in accordance with the requirements of the International Radiotelegraphic Convention is commonly known as the "Berne Bureau." This is merely a branch of the Bureau of the International Telegraph Union, situated at Berne, in Switzerland. It possesses neither powers for initiating new regulations nor for dealing with those already existing; its functions are practically entirely confined to the collection and circulation of information.

Notwithstanding this, the International Bureau at Berne has become an organisation of supreme importance, thanks to the zealous, economical and efficient manner in which it is conducted. To this organisation is entrusted the work of preparing and circulating, in accordance with Article 13 of the Convention, particulars regarding every station located in countries adhering to the Convention.

The normal supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 francs per annum. This sum, however, does not include any special expenditure such as would be necessitated by the holding of an International Conference. For the purpose of fixing their respective contributions towards the expenses, the governing bodies of the contracting States are divided into six classes, as set forth in Article 43 of the regulations. The following is an extract of the work of the Bureau during the last reported year (1921):—

REPORT OF THE WORK OF THE BERNE INTERNATIONAL BUREAU. 15th YEAR (1921).

ORGANISATION AND PERSONNEL.

From its inauguration until the 31st July, 1921, Colonel E. Frey was the Director of the International Bureau. At that date, however, the Swiss Federal Council, having accepted his resignation, nominated M. Henri-L. Etienne, ingénieur-diplôme, vice-directeur of the Central Office of International Railway Transport at Berne.

The personnel of the Radiotelegraphic section of the Bureau is composed of a vice-director, secretary and two under secretaries, with extra assistants as occasion demands.

THE RADIOTELEGRAPHIC CONVENTION OF LONDON.

The Radiotelegraphic Convention of London has been ratified by all the governments of the contracting countries with the exception of three. The countries which have adhered to the Convention since 1921 are: Poland, The Free Town of Danzig and the New Hebrides. Poland, however, has made the following reservations:—

(1) The right to fix special tariffs for radiotelegraphic stations open for public correspondence in Poland.

(2) Until the Treaty of Peace has been ratified with Russia, Polish radiotelegraphic stations are controlled by special laws. Strict observation of the Convention is not, therefore, possible until the re-establishment of peace between Russia and Poland.

French Guiana and Finland have declared their desire to adhere to the Convention.

Luxemburg, Dominican Republic and the Colonies of Holland apply the regulations laid down in the Convention for communications.

Saint Pierre and Miquelon have notified the Bureau that they desire to make use of the services of the Bureau.

The following list shows all adhesions to the Convention of London and the dates of such adhesions:—

Germany	21st June, 1913.
Argentine Republic	—
Austria	12th March, 1914.
Belgium and Belgian Congo	23rd November, 1912.

Monaco	10th December, 1912.
Norway	8th October, 1913.
New Hebrides	8th September, 1921.
Panama	14th July, 1914.
Holland, Netherland Indies and Colony of Curaçao	20th March, 1913.
Peru	12th July, 1915.
Persia	—
Poland	7th January, 1921.
Portugal and Portuguese Colonies, including Portuguese Africa, Portuguese East Africa and Portuguese Asiatic Possessions	2nd December, 1913.
Roumania	27th June, 1913.
Russia and Russian Protectorates and Possessions, including Asiatic Central Russia, Boukhara, Khiva, Western Siberia, Eastern Siberia	5th April, 1913.
St. Marino	1st August, 1913.
Serbes, Croates and Slovenes	17th June, 1919.
Siam	30th May, 1913.
Sweden	30th May, 1913.
Czechoslovakia	23rd April, 1920.
Turkey	—
Uruguay	29th February, 1916.
Venezuela	13th August, 1920.

The number of radiotelegraphic stations that the Bureau dealt with in 1921 was 14,821.

The work of the Bureau in circularising and maintaining the official lists of the countries Call Letters of the various wireless stations of the world is considerably increasing. In spite, however, of the extra work entailed in keeping this information up to date, the administration kept their expenses well below the allowance provided for in the Convention.

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

London, July 5th, 1912.

INTERNATIONAL Radiotelegraphic Convention concluded between Great Britain and various British Colonies and Protectorates,* Union of South Africa, Commonwealth of Australia, Canada, British India, New Zealand, Greece, Italy and Italian Colonies, Germany and Protectorates, United States of America and Possessions, Argentina, Austria, Hungary, Bosnia-Herzegovina, Belgium, Belgian Congo, Brazil, Bulgaria, Chili, Denmark, Egypt, France and Algeria, French West Africa, French Equatorial Africa, Greece, Indo-China, Madagascar, Tunis, Japan and Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Morocco, Monaco, Norway, Netherlands, Dutch Indies, Curaçoa, Persia, Portugal and Portuguese Colonies, Roumania, Russia and Russian Possessions and Protectorates, San Marino, Siam, Spain and Spanish Colonies, Sweden, Turkey and Uruguay.

* Barbados, Basutoland, Bermudas, Borneo, Ceylon, Cyprus, Gold Coast and Ashanti, Malay States (Perak, Selangor, Negri Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong Kong, Bahama Islands, Windward Islands (Grenada, St. Lucia, St. Vincent), Falkland Islands, Fiji Islands, Jamaica, Turks and Caicos Islands, Cayman Islands, Leeward Islands (Antigua, Montserrat, St. Kitts-Nevis, Dominica, Virgin Islands), Malta, Mauritius, Northern and Southern Nigeria, Western Pacific Islands (Fanning Island, Gilbert and Ellice Islands, British Solomon Islands), East African Protectorate, Uganda, Bechuanaland, Nyassaland, British Somaliland, Northern and Southern Rhodesia, Seychelles, Sierra Leone, St. Helena, Straits Settlements (Labuan, Cocos Islands), Swaziland, Trinidad and Tobago, Wei-hai-wei.

The undersigned Plenipotentiaries of the Governments of the countries enumerated above, being assembled in Conference in London, have, by mutual consent, and subject to ratification, concluded the following Convention :—

ARTICLE I.

Application of Provisions.

The High Contracting Parties undertake to apply the provisions of the present Convention at all the radiotelegraph stations (coast stations and ship stations) which are established or worked by the Contracting Parties and open for the service of public correspondence between the land and ships at sea.

They undertake, moreover to impose the observance of these provisions upon private enterprises authorised either to establish or to work radiotelegraphic coast stations open to the service of public correspondence between the land and ships at sea, or to establish or to work radiotelegraphic stations whether open for public correspondence or not on board the ships which carry their flag.

ARTICLE 2.

Interpretation of Terms.

The term coast station means radiotelegraphic station established on land or on board any ship permanently anchored and used for the exchange of correspondence with ships at sea.

The term ship station means any radiotelegraphic station established on board a ship other than a permanently moored ship.

ARTICLE 3.

Compulsory Interchange of Messages.

Coast stations and ship stations are bound to exchange radiotelegrams reciprocally without regard to the radiotelegraph system adopted by such stations.

Each ship station is bound to exchange radiotelegrams with any other ship station without distinction as to radiotelegraphic system adopted by such stations.

Nevertheless, in order not to impede scientific progress, the provisions of the present Article do not prevent the contingent employment of a radiotelegraphic system incapable of communicating with other systems, provided that such incapacity be due to the specific nature of such system and that it be not caused by devices adopted solely with the object of preventing inter-communication.

ARTICLE 4.

Restriction of Service.

Notwithstanding the provisions of Article 3, a station may be appropriated to a restricted public service determined by the object of the correspondence or by other circumstances independent of the system employed.

ARTICLE 5.

Connection with Land Telegraph System.

Each of the High Contracting Parties undertakes to cause the coast stations to be connected with the telegraph system by means of special wires, or, at least, to take such other measures as will ensure a rapid exchange between the coast stations and the telegraph system.

ARTICLE 6.

Notification of Particulars.

The High Contracting Parties shall mutually notify one another of the names of the coast stations and ship stations covered by Article 1

as well as of all the particulars necessary to facilitate and accelerate the radiotelegraphic exchanges as specified in the Detailed Regulations.

ARTICLE 7.

Other Radiotelegraphic Arrangements.

Each of the High Contracting Parties reserves to itself the right to prescribe or to permit in the stations covered by Article 1— independently of the installation of which the particulars are published conformable to Article 6—the installation and working of other arrangements designed for special radiotelegraphic transmission without publication of the details of such devices.

ARTICLE 8.

Interference with Other Stations.

The working of radiotelegraphic stations shall be organised as far as possible in such a manner as not to interfere with the working of other stations of the kind.

ARTICLE 9.

Distress Calls.

Radiotelegraphic stations shall be obliged to accept with absolute priority calls of distress from whatever source, to reply in like manner to such calls, and to give the effect to them which they require.

ARTICLE 10.

Charges.

The charge for a radiotelegram shall include, according to the circumstances :—

1. (a) The "coast charge" which accrues to the coast station.

(b) The "ship charge" which accrues to the ship station.

2. The charge for transmission over the lines of the telegraph system, calculated in accordance with the ordinary rules.

3. The transit charges of the intermediate coast or ship stations and the charges appertaining to special services required by the sender.

The rate of the coast charge shall be subject to the approval of the Government to whose authority the coast station is subject, and the rate of the ship charge to the approval of the Government to which the ship belongs.

ARTICLE 11.

Validity and Modifications.

The provisions of the present Convention are completed by Detailed Regulations which have the same validity and come into force at the same time as the Convention.

The provisions of the present Convention and of the Regulations relating thereto may be modified at any time by mutual consent of the High Contracting Parties. Conferences of Plenipotentiaries having power to modify the Convention and the Regulations shall take place periodically; each Conference shall itself fix the place and time of the succeeding Conference.

ARTICLE 12

Exercise of Voting Powers.

These Conferences shall be composed of Delegates of the Governments of the Contracting Parties.

In the deliberations each country shall have one vote only

If a Government adhere to the Convention or its colonies, possessions or protectorates, subsequent Conferences may determine that the whole or part of such colonies, possessions or protectorates is to be regarded as forming a country for the purposes of the foregoing clauses. But the number of votes to be exercised by a Government, including its colonies, possessions or protectorates, may not exceed six.

The following are regarded as forming a single country for the purposes of the present Article:—

- The Union of South Africa.
- The Australian Commonwealth.
- Canada.
- British India.
- New Zealand.
- Ex-German East Africa.
- Ex-German South-West Africa.
- The Cameroons.
- Togoland.
- The Ex-German Pacific Protectorates.
- Alaska.
- Hawaii and the other American possessions in Polynesia.
- The Philippine Islands.
- Porto Rico and the American possessions in the Antilles.
- The zone of the Panama Canal.
- The Belgian Congo.
- The Spanish Colony of the Gulf of Guinea.
- French West Africa.
- French Equatorial Africa.
- Indo-China.
- Madagascar.
- Tunisia.
- Eritrea.
- Italian Somaliland.
- Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung.
- The Dutch Indies.
- The Colony of Curaçao.
- Portuguese West Africa.
- Portuguese East Africa and the Portuguese possessions in Asia.
- Russian Central Asia (littoral of the Caspian Sea).
- Bokhara.
- Khiva.
- Western Siberia (littoral of the Arctic Ocean)
- Eastern Siberia (littoral of the Pacific Ocean)

ARTICLE 13.

Collection of Information.

The International Bureau of the Telegraph Union shall be entrusted with the duty of collecting, co-ordinating, and publishing information of every kind relating to radiotelegraphy; of circulating in proper form proposals for the modification of the Convention and of the Regulations; of notifying the changes adopted, and, generally, of carrying out any Administrative work which it may be called upon to undertake in the interests of International Radiotelegraphy.

The expenses of this institution shall be borne by all the Contracting Parties.

ARTICLE 14.

Conditions of Transmission and Receipt.

Each of the High Contracting Parties reserves to itself the right to fix the conditions under which it will admit radiotelegrams coming from or destined for a station, whether a ship station or a coast station, which is not subject to the provisions of the present Convention.

If a radiotelegram is admitted, the ordinary charges must be applied to it.

Every radiotelegram originating at a ship station and received by a coast station of the contracting country, or accepted in transit by the Administration of a contracting country, shall be sent forward.

Every radiotelegram intended for a ship shall also be sent forward if the Administration of the contracting country has accepted it from the sender, or if the Administration of a contracting country has accepted it in transit from a non-contracting country, subject to the right of the coast station to refuse transmission to a ship station belonging to a non-contracting country.

ARTICLE 15.

Further Applications.

The provisions of the Articles 8 and 9 of this Convention are equally applicable to radiotelegraphic installations other than those indicated in Article 1.

ARTICLE 16.

Admission of New Parties.

Governments which have not taken part in the present Convention shall be allowed to become party to it at their own request.

Such adherence shall be notified through diplomatic channels to that one of the contracting Governments in whose territory the last Conference was held, and by that Government to the others.

Such adherence shall involve complete acceptance of all the clauses of the present Convention and admission to all the advantages stipulated therein.

The adherence to the Convention of the Government of a country having colonies, possessions, or protectorates shall not carry with it the adherence of the colonies, possessions, or protectorates of such Government, unless a declaration be made to that effect by such Government. These colonies, possessions, or protectorates as a whole, or each one of them separately, may form the subject of a separate adherence or of a separate denunciation under the conditions indicated in the present Article and in Article 22.

ARTICLE 17.

Application of International Telegraph Convention of 1875.

The provisions of Articles 1, 2, 3, 5, 6, 7, 8, 11, 12, and 17, of the International Telegraph Convention of St. Petersburg (Petrograd) dated 10/22 July, 1875, shall be applicable to International Radiotelegraphy.

ARTICLE 18.

Arbitration.

In cases of difference of opinion between two or more contracting Governments concerning the interpretation or the execution either of the present Convention or of the Regulations provided for by Article 11, the question at issue may, by mutual consent, be submitted to arbitration. In that event each of the Governments concerned shall choose another not interested in the question.

The decision of the Arbitrators shall be made by an absolute majority of votes.

In the event of an equality of votes, the Arbitrators shall appoint, in order to settle the difficulty, another Contracting Government not concerned in the question in dispute. In default of an agreement with regard to such choice, each Arbitrator shall propose a Contracting Government not interested in the dispute; and lots shall be drawn as between the Governments proposed. The drawing of lots shall be the prerogative of the Government in whose territory the International Bureau provided for in Article 13 performs its work.

ARTICLE 19.

Legislative Measures.

The High Contracting Parties undertake to adopt or to propose to their respective legislatures the measures necessary to ensure the execution of the present Convention.

ARTICLE 20.

Communication between Contracting Parties.

The High Contracting Powers shall communicate to one another such laws as may have been already enacted or which may be about to be so enacted in their countries, relating to the subject of the present Convention.

ARTICLE 21.

Freedom of Action.

The High Contracting Parties maintain their entire liberty concerning the radiotelegraphic installation not covered by Article 1, and particularly with regard to naval and military installations, and also to stations carrying out communications between fixed points. All such installations and stations shall remain subject solely to the obligations provided for in Articles 8 and 9 of the present Convention.

Nevertheless, when these installations and stations carry out an exchange of maritime public correspondence, they shall conform, in carrying out such service, to the requirements of the Regulations so far as concerns the method of transmission and accounting.

If, on the other hand, coast stations carry out, at the same time as public correspondence with ships at sea, communications between fixed points, they shall not be subject, in the execution of this latter service, to the provisions of the Convention, except as to the observance of Articles 8 and 9 of this Convention.

However, fixed stations which carry out correspondence between land and land must not refuse the exchange of radiotelegrams with another fixed station on account of the system adopted by such station; nevertheless, the liberty of each country shall remain complete in respect of the organisation of the service for correspondence between fixed points and the decision as to the correspondence to be carried out by the stations appropriated to such service.

ARTICLE 22.

Date of Operation.

The present Convention shall come into execution on and from the 1st July, 1913, and

shall remain in force for an indeterminate period and until the expiry of one year from the day upon which it is denounced.

Denunciation shall only take effect as regards the Government in whose name it is made. So far as the other Contracting Parties are concerned, the Convention shall remain in force.

ARTICLE 23.

Ratification.

* The present Convention shall be ratified, and the ratification thereof shall be deposited in London with as little delay as possible.

If one or more of the High Contracting Parties shall not ratify the Convention, it shall not be less valid thereby for the parties which have ratified it.

In witness whereof the respective Plenipotentiaries have signed the Convention in a single copy, which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each Party.

London, the 5th of July, 1912.

FINAL PROTOCOL.

At the time of proceeding to the signature of the Convention adopted by the International Radiotelegraphic Conference of London, the undersigned Plenipotentiaries have agreed as follows:—

I.

The exact nature of the adherence notified on the part of Bosnia-Herzegovina not being yet determined, it is recognised that Bosnia-Herzegovina is entitled to a vote, a decision at a later date being necessary on the question whether this vote belongs to Bosnia-Herzegovina in virtue of the second paragraph of Article 12 of the Convention, or whether this vote is accorded to it conformably to the provisions of the third paragraph of that Article.

II.

The following declaration is placed on record:—

The Delegation of the United States declares that its Government is under the necessity of abstaining from all action with regard to tariffs, because the transmission of radiotelegrams as well as of telegrams in the United States is undertaken, wholly or in part, by commercial or private companies.

III.

The following declaration was also placed on record:—

The Government of Canada reserves to itself the right to fix separately, for each of its coast stations, a total sea charge for radiotelegrams originating from North America and intended for any ship whatever, the coast charge amounting to three-fifths and the ship charge to two-fifths of such total charge.

In witness whereof the respective Plenipotentiaries have drawn up the present Final Protocol, which shall have the same force and the same validity as if the provisions thereof had been inserted in the text itself of the Convention to which it belongs, and they have signed it in a single copy which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each party.

London, the 5th of July, 1912.

SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPHIC CONVENTION.

CONTENTS.

1. Organisation of radiotelegraphic stations.
2. Hours of service of stations.
3. Form and acceptance of radiotelegrams.
4. Charges.
5. Collection of charges.
6. Transmission of radiotelegrams :—
 - (a) Signals of transmission.
 - (b) Order of transmission.
 - (c) Calling of stations and transmission of radiotelegrams.
 - (d) Acknowledgment of receipt and end of work.
 - (e) Route to be followed by radiotelegrams.
7. Delivery of radiotelegrams.
8. Special radiotelegrams.
9. Records.
10. Refunds and reimbursements.
11. Accounting.
12. International Bureau.
13. Meteorological, time, and other transmissions.
14. Miscellaneous provisions.

I.—ORGANISATION OF RADIO-TELEGRAPHIC STATIONS.

I.

Choice of Apparatus.

The choice of radiotelegraphic apparatus and devices to be used by coast stations and ship stations is free. The installation of these stations must, as far as possible, be in keeping with scientific and technical progress.

II.

Wavelength.

Two wavelengths, one of 600 and the other of 300 metres, shall be admitted for the service of general public correspondence. Every coast station open to this service must be equipped in such a way as to be able to use these two wavelengths, of which one shall be designated as the normal wavelength of a station. During the whole time that it is open every coast station must be in a position to receive calls made by means of its normal wavelength. Nevertheless, for the correspondence covered by paragraph 2 of Regulation XXXV, use shall be made of a wavelength of 1,800 metres. Further, each Government may authorise the use, in a coast station, of other wavelengths for the purpose of securing a long-range service or a service other than that of general public correspondence, and established in conformity with the provisions of the Convention, with the reservation that these wavelengths do not exceed 600 metres, or that they do exceed 1,600 metres.

In particular, stations used exclusively for the despatch of signals intended to determine the position of ships must not use wavelengths exceeding 150 metres.

III.

Equipment.

1. Every ship station must be equipped in such a way as to be able to use the wavelengths of 600 metres and of 300 metres. The first shall be the normal wavelength, and may not be exceeded in transmission, the case of Regulation XXXV. (paragraph 2) excepted.

Use may be made of other wavelengths not exceeding 600 metres in special cases, and subject to the approval of the Administrations to which the coast stations and ship stations concerned are subject.

2. During the whole time that it is open every ship station must be able to receive calls made by means of its normal wavelength.

3. Ships of small tonnage, in the case of which it would be materially impossible to use the wavelength of 600 metres for transmission, may be authorised to employ exclusively the wavelength of 300 metres; they must be able to receive by means of the wavelength of 600 metres.

IV.

Communication.

Communications between a coast station and a ship station, or between two ship stations, must be exchanged on both sides by means of the same wavelength. If, in a particular case, communication is difficult, the two stations may, by mutual consent, pass from the wavelength by means of which they are communicating to the other regulation wavelength. Both stations shall resume their normal wavelengths when the radiotelegraphic exchange is finished.

V.

Map and Nomenclature.

1. The International Bureau shall prepare, publish and revise periodically an official map showing the coast stations, their normal ranges, the principal lines of navigation, and the time normally taken by ships for the voyage between the various ports of call.

2. It shall draw up and publish a Nomenclature of the radiotelegraphic stations covered by Article 1 of the Convention, and also periodical supplements for additions and modifications. This Nomenclature shall give, in the case of each station, the following information :—

1st.—For coast stations: the name, nationality, and geographical position indicated by the territorial subdivision and by the longitude and latitude of the place; for ship stations: the name and nationality of the ships; when the case arises, the name and address of the contractor.

2nd.—The call signal. (The call signals must be differentiated from one another, and each one must consist of a group of three letters.)

3rd.—The normal range.

4th.—The radiotelegraphic system with the characteristics of the system of discharge (musical sparks, tone expressed by the number of double vibrations, etc.).

5th.—The wavelengths used (the normal wavelength to be underlined).

6th.—The nature of the services performed.

7th.—The hours of working.

8th.—When necessary the hour and method of despatch of time signals and meteorological telegrams.

9th.—The coast or ship charge.

3. There shall also be included in the Nomenclature such information relating to radiotelegraphic stations other than those covered by Article 1 of the Convention, as shall be communicated to the International Bureau by the Administrations to which such stations are subject, provided that these are either Administrations which are parties to the Convention, or, if they are not parties to it, have made the declaration provided for in Regulation XLVIII.

4. The following notations shall be adopted in documents for the use of the international service to designate radiotelegraph stations:—

PG—Station open for general public correspondence.

PR—Station open for restricted public correspondence.

P—Private station.

O—Station open only for official correspondence.

N—Station always open.

X—Station not having fixed working hours.

5. The name of a ship station indicated in the first column of the Nomenclature must be followed, when there is duplication of the name, by the call-signal of such station.

VI.

Experiments and Practice.

The exchange of unnecessary signals and words is forbidden to the stations covered by Article 1 of the Convention. Experiments and practice shall not be allowed in these stations, except so far as they do not disturb the service of other stations.

Practice must be carried out with wavelengths different from those allowed for public correspondence, and with the minimum of power necessary.

VII.

Compulsory Conditions.

1. All stations are bound to exchange traffic with the minimum of energy necessary to ensure good communication.

2. Every coast and ship station must comply with the following conditions:—

(a) The waves emitted must be as pure and as little damped as possible.

In particular, the use of transmitting devices in which the production of the waves emitted is obtained by discharging the aerial direct by sparks (plain aerial) shall not be allowed except in cases of distress.

It may, however, be allowed in the case of certain special stations (for example, those of small ships) in which the primary power does not exceed 50 watts.

(b) The apparatus must be capable of transmitting and receiving at a speed at least equal to 20 words per minute, the word being reckoned at the rate of five letters.

New installations bringing into play an energy of more than 50 watts shall be equipped in such a way that it may be possible to obtain easily several ranges less than the normal range, the shortest being of approximately 15 nautical miles. Installations already established bringing into play an energy of more than 50 watts shall be transformed as far as possible in such a manner as to satisfy the foregoing requirements.

(c) Receiving apparatus must allow of receiving, with the greatest possible amount of protection from disturbance, transmissions made with the wavelengths specified in present Regulations, up to 600 metres.

3. Stations serving solely for determining the position of ships (*radiophares*) must not operate over an area of greater radius than 30 nautical miles.

VIII.

Power.

Independently of the general conditions specified in Regulation VII, ship stations must also satisfy the following conditions:—

(a) The power transmitted to the radiotelegraphic apparatus, measured at the terminals of the generator of the station, must not under normal circumstances exceed one kilowatt.

(b) Subject to the provisions of Regulation XXXV, par. 2, a power exceeding one kilowatt may be used if the ship is under the necessity of corresponding at a distance of more than 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be realised except by means of an increase of power.

IX.

Licenses.

1. No ship station may be established or worked by private enterprise without a license issued by the Government to which the ship is subject.

Stations on board ship having their port of register in a colony, possession, or protectorate may be described as being subject to the authority of such colony, possession, or protectorate.

2. Every ship station holding a license issued by one of the contracting Governments must be regarded by the other Governments as having an installation fulfilling the conditions imposed by the present Regulations.

The competent authorities of the countries where the ship calls may demand the production of the license. In default of such production, these authorities may ascertain whether the radiotelegraph installations of the ship satisfy the conditions imposed by the present Regulations.

When an Administration has practical evidence that a ship station is not fulfilling these conditions, it must, in every case, address a complaint to the Administration of the country to which the ship is subject. From that point onwards the procedure shall be, when necessary, as provided in Regulation XII, paragraph 2.

X.

Certificates.

1. The service of the ship station must be carried out by a telegraphist holding a certificate issued by the Government to which the ship is subject, or, in an emergency and for one voyage only, by another Government party to the convention.

2. There shall be two classes of certificates:—
The first-class certificate shall state the

professional qualifications of the operator with regard to:—

(a) the adjustment of the apparatus and knowledge of their working;

(b) transmitting and receiving by ear, at a speed which must not be less than 20 words per minute;

(c) knowledge of the regulations applying to the exchange of radiotelegraphic communications.

The second-class certificate may be issued to a telegraphist who only attains to a speed in transmitting and receiving of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Telegraphists holding a second-class certificate may be allowed:—

(a) on ships only using radiotelegraphy for their own service and for the correspondence of the ship's company, in particular on fishing vessels;

(b) on all ships as substitutes, provided that such ships have on board at least one operator holding a first-class certificate. Nevertheless, on ships placed in the first class indicated in Regulation XIII, the service must be carried out by at least two telegraphists holding first-class certificates.

In ship stations, transmissions may only be made by a telegraphist holding a first or second-class certificate, an exception being made in cases of emergency, in which it would be impossible to conform to this provision.

3. Further, the certificate shall testify that the Government has placed the telegraphist under the obligation of preserving the secrecy of correspondence.

4. The radiotelegraph service of the ship station shall be placed under the supreme authority of the captain of the ship.

XI.

Emergency Equipment.

Ships provided with radiotelegraph installations and placed in the first two classes indicated in Regulation XIII shall be bound to have emergency radiotelegraph installations of which all the parts shall be placed in conditions of the greatest safety possible, such conditions to be determined by the Government which issues the licence. These emergency installations must have at command a source of power of their own, must be capable of being set working speedily, must be able to work for six hours at least, and must have a minimum range of 80 nautical miles in the case of ships in the first class, and of 50 miles in the case of those of the second class. This emergency installation shall not be required in the case of ships whose ordinary installation fulfils the conditions of the present article.

XII.

Responsibility for Breach of the Convention.

1. If an Administration has information of a breach of the Convention or of the Regulations committed in one of the stations which it has authorised, it shall ascertain the facts and fix the responsibility.

In the case of ship stations, if the responsibility rests on the operator, the Administration shall take the necessary steps, and, if necessary, shall withdraw the certificate. If it is shown that the breach was due to the condition of the apparatus or to instructions given to the telegraphist, the same procedure shall be followed in respect of the licensee issued to the ship.

2. In the event of repeated breaches by the same ship, if the representations made to the Administration to which the ship is subject, by another Administration, remain without effect, the latter shall have the right, after notice

given, of authorising its coast stations not to accept communications coming from the ship in question. In case of a difference between the two Administrations the questions shall be submitted to arbitration on the request of one of the Governments concerned. The procedure is indicated in Article XVIII of the Convention.

II.—HOURS OF SERVICE OF STATIONS.

XIII.

Land and Ship Stations.

(a) Coast Stations.

1. The service of coast stations shall be, as far as possible, permanent, day and night, without interruptions.

Nevertheless, certain coast stations may have a service of limited duration. Each Administration shall fix the hours of service.

2. Coast stations whose service is not permanent may not close before having transmitted all their radiotelegrams to the ships which are in their radius of action nor before having received from such ships all the radiotelegrams of which notice has been given. This provision shall also apply when ships notify their presence before work has actually ceased.

(b) Ship Stations.

3. Ship stations shall be placed in three classes:—

- (1st) Stations always open;
- (2nd) Stations having limited working hours;
- (3rd) Stations having no fixed working hours.

During navigation, the following must remain permanently on the watch: (1st) ships of the first class; (2nd) those of the second class, during the hours that they are open for service; out of these hours, the latter stations must remain on the watch for the first 10 minutes of each hour. The stations of the third class are not bound to perform any regular "listening" service.

It shall fall to the Governments which issue the licenses specified in Article IX to fix the class in which the ship is to be placed, in respect of its obligations in the matter of keeping watch. This classification shall be mentioned in the licence.

III.—DRAWING UP AND HANDING IN OF RADIO-TELEGRAMS.

XIV.

Transmission from Ship to Land.

1. Radiotelegrams shall bear, as the first word of the preamble, the service instructions "radio."

2. In the transmission of radiotelegrams coming from a ship at sea, the date and the hour of the handing in at the ship station shall be indicated in the preamble.

3. On forwarding over the telegraph system, the coast station shall insert as the indication of the office of origin, the name of the ship of origin as it appears in the Nomenclature, and also, when the case arises, that of the last ship which served as an intermediary. These particulars shall be followed by the name of the coast station.

XV.

Transmission from Land to Ship.

1. The address of radiotelegrams intended for ships must be as complete as possible. It shall be compulsorily drawn up as follows:—

(a) Name or title of the addressee, with supplementary particulars if necessary.

(b) Name of the ship, as it appears in the first column of the Nomenclature.

(c) Name of the coast station, as it appears in the Nomenclature.

Nevertheless the name of the ship may be replaced, at the risks and perils of the sender, by the particulars of the voyage taken by such ship and determined by the names of the ports of origin and destination or by any other equivalent particulars.

2. In the address, the name of the ship, as it appears in the first column of the Nomenclature, shall be counted in every case, and independently of its length, as one word.

3. Radiotelegrams drawn up by means of the International Signal Code shall be forwarded to their destination without being de-coded.

IV.—CHARGES.

xvi.

Coast and Ship Charges.

1. The coast charge and the ship charge shall be fixed in accordance with the tariff per word pure and simple, on the basis of a fair remuneration for radiotelegraphic work, with optional application of a minimum charge per radiotelegram.

The coast charge may not exceed 60 centimes per word, nor the ship charge 40 centimes per word. Nevertheless each Administration shall have the right to authorise coast and ship charges higher than these maxima in the case of stations having a range of more than 400 nautical miles, or of stations exceptionally onerous on account of the material conditions of their installation or working.

The optional minimum charge per radiotelegram may not exceed the coast or ship charge for a radiotelegram of 10 words.

2. In the case of radiotelegrams originating from or intended for a country or exchanged directly with the coast stations of that country, the charge applying to the transmission over the lines of the telegraph system must not exceed, on the average, that of the inland rate of that country.

This charge shall be reckoned per word pure and simple, with an optional minimum charge not exceeding the charge for 10 words. It shall be notified in francs by the Administration of the country to which the coast station is subject.

In the cases of countries in the European system, with the exception of Russia and Turkey, there shall only be a single charge for the territory of each country.

xvii.

Retransmission.

1. When a radiotelegram originating from a ship and intended for *terra firma* passes through one or two ship stations, the charge shall include, in addition to those of the ship of origin, the coast station, and the telegraph system, the ship charge of each of the ships taking part in the transmission.

2. The sender of a radiotelegram originating from *terra firma* and intended for a ship may require that his message be transmitted by way of one or two ship stations; he shall deposit for this purpose the amount of the radiotelegraphic and telegraphic charges, and besides, as a deposit, a sum to be fixed by the office of origin with a view to the payment to the intermediate ship stations of the transit charges fixed in paragraph 1; he must further pay, as he may choose, either the charge for a telegram of five words or the cost of postage of a letter to be sent by the coast station to the office of origin giving the information necessary for the liquidation of the sum deposited.

The radiotelegram shall then be accepted at the risks and perils of the sender; it shall bear before the address the paid additional particulars "x retransmissions telegraphes" or "x retransmissions lettre" (x representing the number of retransmissions required by the sender) accordingly as the sender desires that the information necessary for the liquidation of the deposit be furnished by telegram or by letter.

3. The charge for radiotelegrams originating from a ship, intended for another ship, and sent by way of one or two intermediate coast stations, shall include:—

The ship charges of both ships, the charge of the coast station or the two coast stations, as the case may be, and when necessary the telegraph charge appropriate to the transit between the two coast stations.

4. The charge for radiotelegrams exchanged between ships without the aid of a coast station includes the ship charges of the ship of origin and of the ship of destination, with the ship charges of the intermediate stations added thereto.

5. The coast and ship charges due to the stations of transit shall be the same as those fixed for such stations when these are stations of origin and destination. In no case shall they be collected more than once.

6. In the case of any intermediate coast station, the charge to be collected for the transit service shall be the highest of the coast charges appertaining to the direct exchange with the two ships in question.

xviii.

Origin of Telegrams.

The country in whose territory is established a coast station acting as intermediary for the exchange of radiotelegrams between a ship station and another country shall be regarded, for the purpose of applying telegraphic charges, as the country of origin or of destination of such radiotelegrams and not as the country of transit.

V.—COLLECTION OF CHARGES.

xix.

Tariffs.

1. The total charge for radiotelegrams shall be collected from the sender, with the exception—1st, of the cost of express delivery (Article LVIII, paragraph 1, of the Telegraph Regulations); 2nd, of the charges applying to inadmissible joinings or alterations of words noted by the office or station of destination (Article XIX, paragraph 9, of the Telegraph Regulations), these charges being collected from the addressee.

Ship stations must possess the necessary tariffs for this purpose. They shall have, however, the right to obtain information from coast stations with regard to charges for radiotelegrams for which they do not possess all the necessary information.

2. The counting of words by the office of origin shall be decisive in the case of radiotelegrams addressed to ships, and that of the ship station of origin shall be decisive in the case of radiotelegrams originating in ships, both for the purpose of transmission and for that of the international accounts. Nevertheless when the radiotelegram is worded wholly or in part either in one of the languages of the country of destination, in the case of radiotelegrams originating in ships, or in one of the languages of the country to which the ship belongs, in the case of radiotelegrams addressed

to ships, and when the radiotelegram contains joinings or alterations of words contrary to the common use of that language, the office or ship station of destination, as the case may be, shall have the right to recover from the addressee the amount of the charge not collected. In the case of a refusal to pay the radiotelegram may be withheld.

VI.—TRANSMISSION OF RADIOTELEGRAMS.

(A) SIGNALS OF TRANSMISSION.

XX.

Code.

The signals employed shall be those of the International Morse Code.

XXI.

Distress Signals.

Ships in distress shall make use of the following signal,

• • • — — — • • •

repeated at short intervals, followed by the necessary particulars.

As soon as a station hears the signal of distress, it must suspend all correspondence and must not resume the same until after it has made sure that the communication consequent upon the call for help is finished.

The stations that hear a call of distress must act according to indications given by the ship which makes the call, with regard to the order of messages or their cessation.

When, at the end of a series of distress calls, there is added the call signal of the particular station, the reply to the call is proper to that station only, unless that station does not reply. Failing the indication of a particular station in the call for help, every station that hears the call shall be bound to reply thereto.

XXII.

Information.

For the purpose of giving or asking information concerning the radiotelegraph service, stations must make use of the signals contained in the list appended to the present Regulations. (See p. 17 and Code Section.)

(B) ORDER OF TRANSMISSION.

xxiii.

Duration of Transmission.

Between two stations, radiotelegrams of the same class shall be transmitted singly in alternate order or by series of several radiotelegrams, according to the instructions given by the coast station, on condition that the duration of the transmission of each series does not exceed 15 minutes.

(C) CALLING OF STATIONS AND TRANSMISSION OF RADIOTELEGRAMS.

XXIV.

Calls.

1. As a general rule, it shall be the ship station that calls the coast station, whether it has radiotelegrams to transmit or not.

2. In waters where the radiotelegraphic traffic is congested (the Channel, etc.), the call of a ship to a coast station may not, as a general rule, be made unless the latter is within the normal range of the ship station and the ship station has approached to a distance less than 75 per cent. of the normal range of the coast station.

3. Before proceeding to make a call, the coast station or the ship station must adjust its receiving system to the highest possible degree of sensitiveness, and must make sure that no other communication is being made within its radius of action; if it is otherwise, it

shall await the first break, unless it finds that its call is not likely to disturb the communication in progress. The same applies when the station wishes to answer a call.

4. For making a call every station shall use the normal wave of the station to be called.

5. If, in spite of these precautions, a radiotelegraphic transmission be impeded, the call must cease on the first request made by a coast station open to public correspondence. This station must then indicate the approximate duration of the wait.

6. The ship station must make known to each coast station to which it has notified its presence the time at which it proposes to cease as operations, and also the probable duration of the interruption.

XXV.

Call Signals.

1. The call comprises the signal — — — — —, the call signal of the station, called, sent three times, and the word "de," followed by the call signal of the sending station, sent three times.

2. The station called shall reply by giving the signal — — — — —, followed by the call signal sent three times, of the calling station, by the word "de," its own call signal and the signal — — — — —

3. Stations which wish to enter into communication with ships, without, however, knowing the names of those ships which are within their radius of action, may use the signal — — — — — (signal of enquiry). The provisions of paragraphs 1 and 2 are also applicable to the transmission of the signal of enquiry and to the reply to that signal.

XXVI.

Station failing to Reply.

If a station when called does not reply when the call (Regulation XXV) has been sent three times at intervals of 2 minutes, the call may not be resumed until after an interval of 15 minutes, the station making the call first making sure of the fact that no radiotelegraphic communication is in progress.

XXVII.

Use of High Power.

Every station which has to make a transmission necessitating the use of high power shall first send out three times the warning signal — — — — —, with the minimum of power necessary to reach the neighbouring stations. It shall not then begin to transmit with the high power until 30 seconds after sending the warning signal.

XXVIII.

Particulars regarding Reception.

1. As soon as the coast station has replied, the ship station shall furnish it with the following information if it has messages to transmit to it; this information shall also be given when the coast stations ask for it:—

(a) The approximate distance, in nautical miles, of the vessel from the coast station;

(b) The position of the ship given in a concise form and adapted to the circumstances of the individual case;

(c) The next port at which the ship will touch;

(d) The number of radiotelegrams if they are of normal length or the number of words if the messages are of exceptional length.

The speed of the ship in nautical miles shall be given specially at the express request of the coast station.

2. The coast station shall reply giving, as provided in paragraph 1, either the number of telegrams or the number of words to be transmitted to the ship and also the order of transmission.

3. If transmission cannot take place immediately the coast station shall inform the ship station of the approximate length of the wait.

4. If a ship station when called cannot receive for the moment it shall inform the calling station of the approximate length of the wait.

5. In the case of exchanges between two ship stations it shall rest with the station called to fix the order of transmission.

XXIX.

Exchange of Messages.

When a coast station is called by several ship stations, it shall decide the order in which these stations shall be allowed to exchange their messages.

In the regulation of this order, the coast station shall be guided solely by the necessity for allowing every station concerned to exchange the greatest possible number of radiotelegrams.

XXX.

Order of Transmission.

Before beginning to exchange correspondence, the coast station shall inform the ship station whether the transmission is to be made in alternate order by series (Regulation XXIII); it shall then begin to transmit, or shall follow up these instructions by the signal — • —

XXXI.

Initial and Final Signals.

The transmission of a radiotelegram shall be preceded by the signal — • — • — and ended by the signal • — • — • followed by the call signal of the sending station and by the signal — • —

In the case of a series of radiotelegrams, the call-letter of the sending station and the signal — • — shall only be given at the end of the series.

XXXII.

Lengthy Messages.

When the radiotelegram to be transmitted contains more than 40 words, the sending station shall interrupt the transmission by the signal • • — • • after each series of 20 words or thereabouts, and it shall not resume transmission until after having obtained from the station in correspondence the repetition of the last word clearly received, followed by the said signal, or, if the reception is clear, the signal • • —

In the case of transmission in series, the acknowledgment of receipt shall be given after each radiotelegram.

Coast stations engaged in transmitting long radiotelegrams must suspend transmission at the end of each period of 15 minutes, and must remain silent during a period of 3 minutes before continuing transmission.

Coast and ship stations which work in the conditions laid down in Regulation XXXV, paragraph 2, must suspend work at the end of each period of 15 minutes, and keep watch on the wavelength of 600 metres during a period of 3 minutes before continuing transmission.

XXXIII.

Doubtful Messages.

1. When the signals become doubtful, all possible resources must be drawn upon to accomplish transmission. To this end, the radiotelegram shall be transmitted three times at most, at the request of the receiving station. If in spite of this triple transmission the signals are still unintelligible, the radiotelegram shall be cancelled.

If the acknowledgment of receipt does not come to hand, the sending station shall again call the station with which it is in correspondence. When no reply is made after three calls, the transmission shall not be persevered with. In such case, the sending station shall have the right to obtain the acknowledgment of receipt through the medium of another radiotelegraph station, using, when necessary, the lines of the telegraph system.

2. If the receiving station considers that, in spite of defective receiving, the radiotelegram can be delivered, it shall insert at the end of the preamble the service advice "Reception douteuse," and shall forward the radiotelegram. In such case, the Administration to which the coast station is subject shall claim the charges, in conformity with Clause XLII of the present Regulations. Nevertheless, if the ship station later on transmits the radiotelegram to another coast station of the same Administration, the latter can only claim the charges appertaining to a single transmission.

(D) ACKNOWLEDGMENT OF RECEIPT AND END OF WORK.

XXXIV.

Acknowledgment of Reception and Completion.

1. The acknowledgment of receipt shall be given in the form prescribed by the International Telegraph Regulations; it shall be preceded by the call signal of the sending station and followed by the call signal of the receiving station.

2. The end of the work between two stations shall be indicated by each one of them by means of the signal • • — • — followed by its own call signal

(E) ROUTE TO BE TAKEN BY RADIOTELEGRAMS.

XXXV.

Route of Transmission.

1. As a general principle, the ship station shall transmit its radiotelegrams to the nearest coast station.

However, if the ship station has the choice between several coast stations at equal or nearly equal distances, it shall give the preference to that which is established on the territory of the country of destination or of normal transit of its radiotelegrams.

2. Nevertheless, a sender on board a ship shall have the right to indicate the coast station by which he wishes his radiotelegram to be forwarded. The ship station shall then wait until this coast station is the nearest.

Exceptionally, transmission may be made to a more distant coast station, provided:—

(a) That the radiotelegram is intended for the country in which such coast station is situated and that it comes from a ship subject to that country;

(b) That for calls and transmission both stations use a wavelength of 1,800 metres;

(c) That transmission by this wavelength does not disturb any transmission made, by means of the same wavelength, by a nearer coast station;

(d) That the ship station is more than 50 nautical miles distant from any coast station shown in the Nomenclature. The distance of 50 miles may be reduced to 25 miles, subject to the reservation that the maximum power at the terminals of the generator do not exceed 5 kilowatts and that the ship stations be established in conformity with Regulations VII and VIII. This reduction of distance shall not apply in the seas, bays, or gulfs of which the shores belong to one country only, and of which the opening to the high sea is less than 100 miles wide.

VII.—DELIVERY OF RADIO-TELEGRAMS.

XXXVI. Delivery.

When for any cause whatsoever a radiotelegram coming from a ship at sea and intended for *terra firma* cannot be delivered to the addressee, an advice of non-delivery shall be sent out. This advice shall be transmitted to the coast station which received the original radiotelegram. The latter, after verifying the address, shall forward the advice to the ship, if possible, and, if need be, by way of another coast station of the same country or of a neighbouring country.

When a radiotelegram, having arrived at the ship station, cannot be delivered, that station shall inform the office or ship station of origin by means of a service advice. In the case of radiotelegrams coming from *terra firma* this advice shall be transmitted, whenever possible, to the coast station by way of which the radiotelegram passed, or, if necessary, to another coast station of the same country or of a neighbouring country.

XXXVII. Non-delivery.

If the ship to which the radiotelegram is addressed has not notified its presence to the coast station within the time specified by the sender, or, in the absence of such specification, up to the morning of the eighth day following, such coast station shall give notice of the fact to the office of origin, which shall inform the sender of the same.

This latter shall have the option of requiring by paid service advice, telegraphic or postal, addressed to the coast station, that his radiotelegram be kept for a fresh period of nine days for transmission to the ship, and so on. In the absence of such request the radiotelegram shall be returned as undelivered at the end of the ninth day (the day of handing in not to be included).

However, if the coast station is sure that the ship has left its radius of action before the station could have transmitted the radiotelegram to it, such station shall immediately inform the office of origin, which shall without delay advise the sender of the cancellation of the message. Nevertheless, the sender may, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

VIII.—SPECIAL RADIOTELEGRAMS.

XXXVIII.

Special Messages.

The following only shall be allowed:—

1st, *Reply Paid Radiotelegrams*.—These radiotelegrams shall bear, before the address, the indication, "Réponse payée," or "RP," completed by the mention of the amount paid in advance for the reply—for example: "Réponse payée fr. x," or "Rp. fr. x."

The reply voucher issued on board a ship shall give the right to send, up to the limit of its value, a radiotelegram to any address whatever from the ship station which issues such voucher.

2nd, *Collated Radiotelegrams*.

3rd, *Express Delivery Radiotelegrams*.—But only in cases in which the amount of the cost of express delivery is collected from the addressee. The countries which cannot adopt these radiotelegrams must notify the fact to the Inter-

national Bureau. Radiotelegrams for express delivery, with collection of the cost from the sender, may be allowed when they are intended for the country in whose territory the corresponding coast station is situated.

4th, *Radiotelegrams for Delivery by Post*.

5th, *Multiple Radiotelegrams*.

6th, *Radiotelegrams with Acknowledgment of Receipt*.—But only with regard to notification of the date and time at which the coast station has transmitted to the ship station the telegram addressed to the latter.

7th, *Paid Service Advices*.—Except those asking for repetition of information. Nevertheless, all paid service advices shall be allowed on the route over the telegraph lines.

8th, *Urgent Radiotelegrams*.—But only in transmission over the telegraph lines, and subject to the application of the International Telegraph Regulations.

XXXIX.

Postal Radiotelegrams.

Radiotelegrams may be transmitted by a coast station to a ship, or by a ship to another ship, with the object of being forwarded by post, the posting to take place from a port of call of the receiving ship.

The address of these radiotelegrams must be drawn up as follows:—

1st, Paid instruction "poste," followed by the name of the port where the radiotelegram is to be posted;

2nd, Full name and address of the addressee;

3rd, Name of the ship station which is to carry out the posting;

4th, When necessary, name of the coast station.

Example:—Poste Buenos Aires, Martinez 14 Calle Prat, Valparaiso, Avon Lizard.

The charge shall include, as well as the radiotelegraph and telegraph charges, a sum of 25 centimes for the postage of the radiotelegram.

IX.—ARCHIVES.

XL.

Records.

The originals of radiotelegrams, as well as the documents relating thereto, retained by the Administrations, shall be kept with all necessary precautions in respect of secrecy for at least fifteen months, counting from the month following that in which the radiotelegrams were handed in.

These originals and documents shall be sent, as far as possible, at least once a month by the ship stations to the Administrations to which they are subject.

X.—REFUNDS AND REIMBURSEMENTS.

XLI.

Refund of Charges.

With regard to refunds and reimbursements, the provisions of the International Telegraph Regulations shall apply, bearing in mind the restrictions laid down in Clauses XXXVIII and XXXIX of the present Regulations and subject to the following reservations:—

The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in, the period of delay giving rise to refunds and reimbursements.

If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the Administration of the country of origin shall immediately initiate the reimbursement to the sender of the coast and ship charges in respect of such radiotelegram. In this case, the charges reimbursed shall not appear in the account for which provision is made by Regulation XLII, but the radiotelegram shall be mentioned therein as a memorandum.

Reimbursements shall be borne by the various Administrations and private enterprises which have taken part in the forwarding of the radiotelegram, each one of them relinquishing its share of the charge. Nevertheless, radiotelegrams falling under the provision of Articles VII and VIII of the Convention of St. Petersburg shall remain subject to the provisions of the International Telegraph Regulations, except when it is due to an error of service that such radiotelegrams have been accepted.

When the acknowledgment of receipt of a radiotelegram has not reached the station which transmitted the message, the charge shall not be refunded until it has been proved that the radiotelegram is one which gives occasion for reimbursement.

XI.—ACCOUNTING.

XLII. *Accounts.*

1. Coast and ship charges shall not be entered in the accounts provided for by the International Telegraph Regulations.

The accounts relating to these charges shall be settled by the Administrations of the countries concerned. They shall be prepared by the Administrations to which the coast stations belong, and communicated by them to the Administrations concerned. In cases in which the working of the coast stations is independent of the Administration of the country, the person working these stations may be substituted in respect of accounts for the Administration of such country.

2. As to transmission over the lines of the telegraph system the radiotelegram shall be treated in respect of accounts in conformity with the Telegraph Regulations.

3. In the case of radiotelegrams originating from ships the Administration to which the coast station is subject shall debit the Administration to which the ship station of origin is subject with the coast and ordinary telegraph charges, the total charges collected for prepaid replies, the coast and telegraph charges collected for collations, the charges appertaining to express delivery (in the case provided for in Regulation XXXVIII) or delivery by post, and with those collected for supplementary copies (TM). The Administration to which the coast station is subject shall credit, when the case arises, through the channel of the telegraph accounts and through the medium of the offices which have taken part in the transmission of the radiotelegrams, the Administration to which the office of destination is subject with the total charges relating to prepaid replies. With regard to telegraph charges and charges relating to express delivery or delivery by post, and to supplementary copies, the procedure shall be in conformity with the telegraph regulations, the coast station being regarded as the telegraph office of origin.

In the case of radiotelegrams intended for a country lying beyond that to which the coast station belongs, the telegraph charges to be liquidated conformably to the above

provisions are those which arise either from tables "A" and "B" appended to the International Telegraph Regulations or from special arrangements concluded between the Administrations of adjoining countries and published by those Administrations and not the charges which might be made under the special provisions of Regulations XXIII (paragraph 1) and XXVII (paragraph 1) of the Telegraph Regulations.

In the case of radiotelegrams and paid-service advices addressed to ships, the Administration to which the office of origin is subject shall be debited directly by that to which the coast station is subject with the coast and ship charges. Nevertheless, the total charges appertaining to prepaid replies shall be credited, if there is occasion, from country to country through the channel of Administration to which the coast station is subject. In respect to the telegraph charges and charges relating to delivery by post and for supplementary copies, the procedure shall be in conformity with the telegraph regulations. The Administration to which the coast station is subject shall credit that to which the ship of destination is subject with the ship charge, if there is occasion, with the charges belonging to the intermediate ship stations, with the total charge collected for prepaid replies, with the ship charge relating to collation, and also with the charges made for preparing supplementary copies and for delivery by post.

The paid service advices, and the prepaid replies themselves, shall be treated, in the radiotelegraphic accounts, in all respects like other radiotelegrams.

In the case of radiotelegrams forwarded by means of one or two intermediate ship stations, each of the latter shall debit the ship station of origin, if the radiotelegram is one coming from a ship, or the ship station of destination if the radiotelegram is one intended for a ship, with the ship charge due to it for transit.

4. In principle the settlement of account appertaining to exchanges between ship stations shall be made directly as between the companies working those stations, the station of origin being debited by the station of destination.

5. The monthly accounts serving as a basis for the special accounting in respect of radiotelegrams shall be drawn up radiotelegram by radiotelegram, with all necessary particulars, and within a period of six months counting from the month to which they belong.

6. The Governments reserve to themselves the option of making between themselves and with private companies (contractors working radiotelegraphic stations, shipping companies, etc.) special arrangements with a view to the adoption of other provisions respecting accounts.

XII.—INTERNATIONAL BUREAU.

XLIII. *Expenses.*

The supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 fcs. per annum, not including special expenses to which the meeting of an International Conference gives rise. The Administrations of the contracting States shall be, for the purposes of contribution towards the expenses, divided into six classes as follows :—

1st Class.—Union of South Africa, Germany, United States of America, Alaska, Hawaii, and the other American possessions in Polynesia, the Philippine Islands, Porto Rico and the American possessions in the Antilles, the zone of the Panama Canal, the Argentine Republic, Australia, Austria, Brazil, Canada, France, Great Britain, Hungary, British India, Italy, Japan New Zealand, Russia, Turkey.

2nd Class.—Spain.

3rd Class.—Russian Central Asia (littoral of the Caspian Sea), Belgium, Chili, Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Dutch Indies, Norway, Holland, Portugal, Roumania, Western Siberia (littoral of the Arctic Ocean), Eastern Siberia (littoral of the Pacific Ocean), Sweden.

4th Class.—Ex-German East Africa, Ex-German South-West Africa, The Cameroons, Togoland, Ex-German Pacific Protectorates, Denmark, Egypt, Indo-China, Mexico, Siam, Uruguay.

5th Class.—French West Africa, Bosnia-Herzegovina, Bulgaria, Greece, Madagascar, Tunis.

6th Class.—French Equatorial Africa, Portuguese West Africa, Portuguese East Africa and the Portuguese possessions in Asia, Bokhara, the Belgian Congo, the Colony of Curaçao, the Spanish Colony of the Gulf of Guinea, Erythrea, Khiva, Morocco, Monaco, Persia, San Marino, Italian Somaliland.

XLIV.

Work of Berne Bureau.

The various Administrations shall forward to the International Bureau a form modelled on that hereto appended (see page 19 and containing the particulars enumerated in the form with regard to the stations covered by Clause V of the Regulations. Any modifications which may take place and additions shall be communicated by the Administrations to the International Bureau from the 1st to the 10th of each month. With the help of these communications the International Bureau will draw up the Nomenclature provided for by Regulation V. The Nomenclature shall be distributed to the Administrations concerned. It may also, with the supplements relating thereto, be sold to the public at cost price.

The International Bureau shall take care that the adoption of identical call signals for radiotelegraph stations be avoided.

XIII.—METEOROLOGICAL TRANSMISSIONS, TIME SIGNALS, AND OTHER TRANSMISSIONS.

XLV.

Meteorological and other Messages.

1. The Administrations shall take the necessary steps to supply their coast stations with meteorological telegrams containing the particulars of interest to the district of such stations. These telegrams, the text of which must not exceed twenty words, shall be sent to the ships which ask for them. The charge for these meteorological telegrams shall be carried to the account of the ships to which they are addressed.

2. The meteorological observations, made by certain ships appointed for that purpose by the country to which they belong, may be sent once a day as paid service advices to the coast stations authorised to receive them by

the Administrations concerned, who shall also appoint the meteorological offices to which these observations shall be addressed by the coast station.

3. Time signals and meteorological telegrams shall be transmitted in succession one to another in such a way that the total duration of their transmission does not exceed ten minutes. In principle, while they are being sent, radiotelegraph stations, transmission by which might disturb the reception of these signals and telegrams, shall keep silent so as to allow all stations which desire to do so to receive these telegrams and signals. Exception shall be made in the case of distress calls and State telegrams.

4. The Administrations shall facilitate the communication to the marine information agencies which they may appoint of the information respecting wrecks and casualties at sea, or presenting a general interest for navigation, which the coast stations can communicate regularly.

XIV.—MISCELLANEOUS PROVISIONS.

XLVI.

Interference.

Transmission exchanged between ship stations must be carried out in such a way as not to interfere with the service of coast stations, as the latter must have, as a general rule, right of priority for public correspondence.

XLVII.

Compulsory Retransmission.

Coast stations and ship stations shall be bound to take part in the retransmission of radiotelegrams in cases in which communication cannot be established directly between the stations of origin and destination.

Nevertheless, the number of transmissions shall be limited to two.

In the case of radiotelegrams intended for *terra firma* use may only be made of retransmissions to reach the nearest coast station.

Retransmission shall be in all cases subject to the condition that the intermediate station which receives the radiotelegram in transit is in a position to send it on.

XLVIII.

Non-Contracting Governments.

If the transmission of a radiotelegram is carried out partly on the telegraph lines or through radiotelegraph stations belonging to a non-contracting Government, such radiotelegram may be sent forward, subject to the reservation that at least the Administrations to which these lines or stations belong shall have declared that they are willing to apply, when the case arises, the provisions of the Convention and of the Regulations, which are indispensable, in order that radiotelegrams may be regularly forwarded, and that accounting may be assured.

Such declaration shall be made to the International Bureau, and brought to the knowledge of the offices of the Telegraph Union.

XLIX.

Operation of Modifications to Regulations.

The modifications of the present Regulations which may be rendered necessary in consequence of the decisions of future Telegraph Conferences shall come into force on the date fixed for the application of the provisions decided upon by each one of these later Conferences.

L.

Application of International Telegraph Regulations.

The provisions of the International Telegraph Regulations shall apply by analogy to radiotelegraph correspondence in so far as they are not contrary to the provisions of the present Regulations.

The following in particular apply to radiotelegraph correspondence :—

The provisions of Article XXVII, paragraphs 3 to 6, of the Telegraph Regulations referring to the collection of charges; those of Articles XXXVI and XLI referring to the indication of the route to be taken; those of Articles LXXV, paragraph 1, LXXVIII, paragraphs 2 to 4, and LXXIX, paragraphs 2 to 4, relating to preparing of accounts. Nevertheless, first, the period of six months provided by paragraph 2 of Article LXXIX of the Telegraph Regulations for the verification of accounts is extended to nine months in the case of radiotelegrams; second, the provisions of Article XVI, paragraph 2, are not con-

sidered as authorising the free transmission by radiotelegraph stations of service telegrams relating exclusively to the telegraph service, nor the free transmission over the lines of the telegraph system of service telegrams relating exclusively to the radiotelegraph service; third, the provisions of Article LXXIX, paragraphs 3 and 5, do not apply to radiotelegraph accounting. For the purposes of applying the provisions of the Telegraph Regulations coast stations shall be regarded as offices of transit, except when the Radiotelegraphic Regulations stipulate expressly that these stations are to be considered as offices of origin or destination.

Conformable to Article II of the Convention of London the present regulations will come into force on July 1st, 1913.

In witness whereof the respective Plenipotentiaries have signed these Regulations on a single copy, which will remain deposited in the Archives of the British Government, and of which a copy will be sent to each party.

APPENDIX

I.

TABLE REFERRED TO IN REGULATION XLIV (p. 18.)

(a) COAST STATIONS.

Name.	Nationality.	Geographical Position. E=East longitude; O=West longitude; N=North latitude; S=South latitude. Territorial subdivisions.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres (the normal wavelength is underlined).
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Nature of Services effected.	Working hours (Time according to the Meridian).	Coast Charge.		Observations (if occasion. Time and Method of sending Time-Signals and Meteorological Telegrams).
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	

(b) SHIP STATIONS.

Name.	Nationality.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres.
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Nature of Services effected.	Working Hours.	Ship Charge.		Observations (if occasion. Name and Address of the person working the Station).
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	

1* WARSHIPS.

2* MERCHANT SHIPS.

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS (referred to in Article XXII, p. 12).

(The abbreviations are to be found in the Code Section.)

INTERNATIONAL CONVENTION

ON

SAFETY OF LIFE AT SEA

London, January 20th, 1914.

THE London International Conference on the Safety of Life at Sea, by which the Convention signed on January 20th, 1914, has been drawn up, met for the first time on November 12th, 1913, at the Foreign Office, London. The suggestion that such a Conference should be held emanated from the ex-German Emperor, and the task of convening it was undertaken by the British Government. The following States were represented: Great Britain, Germany, the United States, Australia, Austria-Hungary, Belgium, Canada, Denmark, Spain, France, Italy, Japan, Norway, the Netherlands, Russia, Sweden, and New Zealand. The delegations from the different States, were composed, not of the representatives of the shipping trade, but of administrators, experts and jurists.

The late Lord Mersey was appointed Chairman of the Conference. To deal with the specific subjects submitted to it the Conference appointed five sub-committees, together with a sixth sub-committee for drafting the Convention, which was to embody the recommendations of the Committees as approved by the whole Conference.

The Convention contains seventy-four articles, of which we present below those articles which govern the use of wireless telegraphy:—

CHAPTER I.

SAFETY OF LIFE AT SEA.

Article 1.—The High Contracting Parties undertake to give effect to the provisions of this Convention, for the purpose of securing safety of life at sea, to promulgate all regulations and to take all steps which may be necessary to give the Convention full and complete effect.

The provisions of this Convention are completed by Regulations which have the same force and take effect at the same time as the Convention. Every reference to the Convention implies at the same time a reference to the Regulations annexed thereto.

CHAPTER II.

SHIPS TO WHICH THIS CONVENTION APPLIES

Article 2.—Except where otherwise provided by this Convention, the merchant ships of any of the States of the High Contracting Parties, which are mechanically propelled, which carry more than 12 passengers, and which proceed from a port of one of the said States to a port situated outside that State, or conversely, are subject to the provisions of this Convention. Ports situated in the Colonies, Possessions, or Protectorates of the High Contracting Parties are considered to be ports outside the States of the High Contracting Parties.

Persons who are on board by reason of *force majeure* or in consequence of the obligation laid upon the master to carry shipwrecked or other persons, are not deemed to be passengers.

Article 3.—There are excepted from this Convention, save in the cases where the Convention otherwise provides, ships making

voyages specified in a schedule to be communicated by each High Contracting Party to the British Government at the time of ratifying the Convention.

No schedule may include voyages in the course of which the ships go more than 200 sea miles from the nearest coast.

Each High Contracting Party has the right subsequently to modify its schedule of voyages in conformity with this Article on condition that it notifies the British Government of such modification.

Each High Contracting Party has the right to claim from another Contracting Party the benefit of the privileges of the Convention for all of its ships which are engaged in any one of the voyages mentioned in its own schedule. For this purpose the Party claiming the obligations prescribed by the Convention in so far as, having regard to the nature of the voyage, these obligations would not be unnecessary or unreasonable.

Article 4.—No ship, not subject to the provisions of the Convention at the time of its departure, can be subjected to the Convention in the course of its voyage if stress of weather or any other cause of *force majeure* compels it to take refuge in a port of one of the States of the High Contracting Parties.

CHAPTER III.

SAFETY OF NAVIGATION.

Article 5.—When the expression "every ship" is used in this chapter and in the corresponding part of the annexed Regulations it includes all merchant ships, whether they are the ships defined in Article 2 or not, which belong to any of the Contracting States.

Article 6.—The High Contracting Parties undertake to take all steps to ensure the destruction of derelicts in the northern part of the Atlantic Ocean east of a line drawn from Cape Sable to a point situated in latitude 34° north and longitude 70° west. Further, they will establish in the North Atlantic with the least possible delay a service for the study and observation of ice conditions and a service of ice patrol. For this purpose:

Two vessels shall be charged with these three services.

During the whole of the ice season they shall be employed in ice patrol.

During the rest of the year the two vessels shall be employed in the study and observation of ice conditions and in the destruction of derelicts; nevertheless the study and observation of ice conditions shall be effectively maintained, in particular from the beginning of February to the opening of the ice season.

While the two vessels are employed in ice patrol the High Contracting Parties, to the extent of their ability and so far as the exigencies of the Naval Service will permit, will send warships or other vessels to destroy any dangerous derelicts, if this destruction is considered necessary at that time.

Article 7.—The Government of the United States is invited to undertake the management of the three services of derelict destruction, study and observation of ice conditions, and ice patrol. The High Contracting Parties which are specially interested in these services, and whose names are given below, undertake to contribute to the expense of establishing and working the said services in the following proportions:—

	Per cent.
Austria-Hungary	2
Belgium	4
Canada	2
Denmark	2
France	15
Germany	15
Great Britain	30
Italy	4
Netherlands	4
Norway	3
Russia	2
Sweden	2
United States of America	15

Each of the High Contracting Parties has the right to discontinue its contribution to the expense of working these services after September 1st, 1916. Nevertheless, the High Contracting Party which avails itself of this right will continue responsible for the expenses of working up to the 1st September following the date of denunciation of the Convention on this particular point. To take advantage of the said right, it must give notice to the other Contracting Parties at least six months before the said 1st September; so that, to be free from its obligations on September 1st 1916, it must give notice on March 1st, 1916, at the latest, and similarly for each subsequent year.

In case the United States Government should not accept the proposal made to them, or in case one of the High Contracting Parties, for any reason, should not assume responsibility for the pecuniary contribution defined above, the High Contracting Parties shall settle the question in accordance with their mutual interests.

The Government of the High Contracting Party which undertakes the management of the service of derelict destruction is invited

to devise means of granting, at the expense of this service, to merchant ships, which have contributed in an effective manner to the destruction of ocean derelicts, rewards to be fixed by the Government in accordance with the services rendered.

The High Contracting Parties which contribute to the cost of the three above-mentioned services shall have the right by common consent to make from time to time such alterations in the provisions of this Article and of Article 6 as appear desirable.

Article 8.—The master of every ship which meets with dangerous ice or a dangerous derelict is bound to communicate the information by all the means of communication at his disposal to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate.

Every Administration which receives intelligence of dangerous ice or a dangerous derelict shall take all steps which it thinks necessary for bringing the information to the knowledge of those concerned and for communicating it to the other Administrations.

The transmission of the messages respecting ice and derelicts is free of cost to the ships concerned.

It is desirable that the said information should be sent in a uniform manner. For this purpose a code, the use of which is optional, appears in Article I of the Regulations annexed hereto.

Article 9.—The master of every ship fitted with a radiotelegraph installation, on becoming aware of the existence of an imminent and serious danger to navigation, shall report it immediately in the manner prescribed by Article II of the Regulations annexed hereto.

Article 10.—When ice is reported on, or near his course, the master of every ship is bound to proceed at night at a moderate speed, or to alter his course so as to go well clear of the danger zone.

Article 11.—The ships defined by Article 2 shall have on board a Morse signalling lamp of sufficient range.

The use of Morse signals is regulated by the Code appearing in Article III as well as by Article IV of the Regulations annexed hereto.

Article 12.—The use of the international distress signals for any other purpose than that of signals of distress is prohibited on every ship.

The use of private signals which are liable to be confused with the international distress signals is prohibited on every ship.

Article 13.—The selection of the routes across the North Atlantic in both directions is left to the responsibility of the steamship companies. Nevertheless the High Contracting Parties undertake to impose on these companies the obligation to give public notice of the regular routes which they propose their vessels should follow, and of any changes which they make in them.

The High Contracting Parties undertake, further, to use their influence to induce the owners of all vessels crossing the Atlantic to follow as far as possible the routes adopted by the principal companies.

Article 14.—The High Contracting Parties undertake to use all diligence to obtain from the Governments which are not parties to this Convention their agreement to the revision of the International Regulations for Preventing Collisions at Sea as indicated below:—

(A) The Regulations shall be completed or revised in regard to the following points:

- (1) The second white light.
- (2) The stern light.
- (3) A day signal for motor vessels.
- (4) A sound signal for a vessel towed.
- (5) The prohibition of signals similar to distress signals.

(B) Articles 2, 10, 14, 15, 31 of the said Regulations shall be amended in accordance with the following provisions:

Article 2. The second white mast-head light to be compulsory.

Article 10. A permanent fixed stern light to be compulsory.

Article 14. A special day signal to be compulsory for motor vessels.

Article 15. A special sound signal to be established for use by a vessel in tow, or if the tow is composed of several vessels, by the last vessel of the tow.

Article 31. Article 31 to be modified in the following manner: Add to the lists of both day and night signals the international radiotelegraph distress signal.

Article 15.—The Governments of the High Contracting Parties undertake to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that from the point of view of safety of life at sea, the ships defined in Article 2 shall be sufficiently and efficiently manned.

Chapter IV, which contains Articles 16 to 30, refers to construction.

CHAPTER V.

RADIOTELEGRAPHY.

Article 31.—All merchant ships belonging to any of the Contracting States, whether they are propelled by machinery or by sails, and whether they carry passengers or not, shall, when engaged on the voyages specified in Article 2, be fitted with a radiotelegraph installation if they have on board fifty or more persons in all.

Advantage may not be taken of the provisions of Articles 2 and 3 of this Convention to exempt a ship from the requirements of this chapter.

Article 32.—Ships on which the number of persons on board is exceptionally and temporarily increased up to or beyond fifty as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons, are exempted from the above obligation.

Moreover, the Governments of each of the Contracting States, if they consider that the route and the conditions of the voyage are such as to render a radiotelegraph installation unreasonable or unnecessary, may exempt from the above requirement the following ships:—

- (1) Ships which in the course of their voyage do not go more than 150 sea miles from the nearest coast.

- (2) Ships on which the number of persons on board is exceptionally or temporarily increased up to or beyond fifty by the carriage of cargo hands or a part of the voyage, provided that the said ships are not going from one Continent to another, and that, during that part of their voyage, they remain within the limits of latitude 30° N. and 30° S.

- (3) Sailing vessels of primitive build, such as *dhow*s, *junks*, etc., if it is practically impossible to instal a radiotelegraph apparatus.

Article 33.—Ships which, in accordance with Article 31 above, are required to be fitted with a radiotelegraph installation are divided, for the purpose of radiotelegraph service, into three classes, in accordance with the classification established for ship stations in Article XIII (b) of the Regulations annexed to the Radiotelegraph Convention, signed in London on July 5th, 1912, viz:—

First Class.—Ships having a continuous service.

There shall be placed in the First Class ships which are intended to carry twenty-five or more passengers:—

- (1) if they have an average speed in service of fifteen knots or more;

- (2) if they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board two hundred persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports. Nevertheless these ships may be placed in the Second Class on condition that they have a continuous watch.

Second Class.—Ships having a service of limited duration.

There shall be placed in the Second Class all ships which are intended to carry twenty-five or more passengers, if they are not, for other reasons, placed in the First Class.

Ships placed in the Second Class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

Third Class.—Ships which have no fixed periods of service.

All ships which are placed neither in the First nor in the Second Class shall be placed in the Third Class.

The owner of a ship placed in the Second or in the Third Class has the right to require that, if the ship complies with all the requirements for a superior class, a statement to the effect that it belongs to that superior class shall be inserted in the Safety Certificate.

Article 34.—Ships which are required by Article 31 above to be fitted with a radiotelegraph installation shall be required, by the Government of the countries to which they belong, to maintain a continuous watch during navigation as soon as the said Governments consider that it will be of service for the purpose of safety of life at sea.

Meanwhile, the High Contracting Parties undertake to require, from the date of the ratification of the present Convention, subject to the delays specified below, a continuous watch on the following ships:—

- (1) Ships whose average speed in service exceeds thirteen knots, which have on board 200 persons or more, and which, in the course of their voyage, go a distance of more than 500 sea miles between two consecutive ports, when these ships are placed in the Second Class.

- (2) Ships in the Second Class, for the whole of the time during which they are more than 500 sea miles from the nearest coast.

(3) Other ships specified in Article 31, when they are engaged in the Trans-Atlantic trade, or when they are engaged in other trades if their route takes them more than 1,000 sea miles from the nearest coast.

Ships connected with all kinds of fishing business, including whaling, which are required to be fitted with a radiotelegraph installation, shall not be required to maintain a continuous watch.

The continuous watch may be kept by one or more operators, holding certificates in accordance with Article X of the Regulations annexed to the International Radiotelegraph Convention, 1912, together, if necessary, with one or more certificated watchers. Nevertheless, if an efficient automatic calling apparatus is invented, the continuous watch may be maintained by this means by agreement between the Governments of the High Contracting Parties.

By "certificated watcher" is meant any person holding a certificate issued under the authority of the Administration concerned. To obtain this certificate, the applicant must prove that he is capable of receiving and understanding the radiotelegraph distress signal and the safety signal described in the Regulations annexed hereto.

The High Contracting Parties undertake to take steps to ensure that the certificated watchers observe the secrecy of correspondence.

Article 35.—The radiotelegraph installations required by Article 31 above shall be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 sea miles by day under normal conditions and circumstances.

Every ship which is required, in conformity with the provisions of Article 31 above, to be fitted with a radiotelegraph installation, shall, whatever be the class in which it is placed, be provided in accordance with Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, with an emergency installation, every part of which is placed in a position of the greatest possible safety to be determined by the Government of the country to which the ship belongs.

In all cases the emergency installation must be placed, in its entirety, in the upper part of the ship, as high as practically possible.

The emergency installation includes, as provided by Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, an independent source of energy capable of being put into operation rapidly and of working for at least six hours with a minimum range of eighty sea miles for ships in the First Class and fifty sea miles for ships in the two other classes.

If the normal installation, which, in accordance with this Article, has a range of at least 100 sea miles, satisfies all the conditions prescribed above, an emergency installation is not required.

The license provided for in Article IX of the Regulations annexed to the International Radiotelegraph Convention, 1912, may not be issued unless the installation complies both with the provisions of that Convention and also with the provisions of this Convention.

Article 36.—The matters governed by the International Radiotelegraph Convention, 1912, and the Regulations annexed thereto, and in particular the radiotelegraph installations on ships, the transmission of messages, and the certificates of the operators, remain and will continue subject to the provisions:

(1) Of that Convention and the Regulations annexed thereto, or of any other instruments which may in the future be substituted therefor;

(2) Of this Convention, in regard to all the points in which it supplements the afore mentioned documents.

Article 37.—Every master of a ship who receives a call for assistance from a vessel in distress is bound to proceed to the assistance of the persons in distress.

Every master of a vessel in distress has the right to requisition from among the ships which answer his call for assistance the ship or ships which he considers best able to render him assistance, but he must exercise this right only after consultation, so far as may be possible, with the masters of those ships. Such ships are then bound to comply immediately with the requisition by proceeding with all speed to the assistance of the persons in distress.

The masters of the ships which are required to render assistance are released from this obligation as soon as the master or masters requisitioned have made known that they will comply with the requisition, or as soon as the master of one of the ships which has reached the scene of the casualty has made known to them that their assistance is no longer necessary.

If the master of a ship is unable, or considers it unreasonable or unnecessary, in the special circumstances of the case, to go to the assistance of the vessel in distress, he must immediately inform the master of the vessel in distress accordingly. Moreover, he must enter in his log book the reasons justifying his action.

The above provisions do not prejudice the International Convention for the unification of certain rules with respect to Assistance and Salvage at Sea, signed at Brussels on September 23rd, 1910, and, in particular, the obligation to render assistance laid down in Article II of that Convention.

Article 38.—The High Contracting Parties undertake to take all steps necessary for giving effect to the provisions of this chapter with the least possible delay. Nevertheless, they may allow:

A delay not exceeding one year, from the date of the ratification of this Convention for the provision and training of operators and for the installation of the apparatus on ships placed in the First and Second Classes.

A delay not exceeding two years, from the date of the ratification of this Convention, for the provision and training of the operators and watchers on the ships in the Third Class, for the installation of the apparatus on ships in the Third Class and for the establishment of a continuous watch on ships placed in the Second and Third Classes.

Chapter VI refers to Life-saving Appliances and Fire Protection.

REGULATIONS. SAFETY OF NAVIGATION.

ARTICLE I.

CODE FOR THE TRANSMISSION BY RADIOTELEGRAPHY OF INFORMATION RELATING TO ICE, DERELICTS, AND WEATHER.

Information relating to ice, derelicts and weather codes is to be found in the Meteorological Section of this book.

ARTICLE II.

SAFETY SIGNAL.

Information relating to the Safety Signal is to be found in the Meteorological Section of this book.

ARTICLE III.

MORSE CODE.

See Code Section of this book for information relating to the Morse Code and Signals.

SAFETY CERTIFICATE.

Radiotelegraph installation :—

—	Class and numbers required by Articles 33 and 34 of the said Convention.	Actual class and numbers.
Class of Ship :—	—	—
Number of { Operators of the 1st Class ..	—	—
" " 2nd " ..	—	—
{ Certificated Watchers	—	—

III. That in all other respects the ship complies with the requirements of the said Convention so far as those requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

Issued at

the day of

LAWS AND REGULATIONS AFFECTING RADIOTELEGRAPHY AND TELEPHONY.

THE VARIOUS ACTS, DECREES, REGULATIONS, ETC., REFERRED TO IN THE FOLLOWING LAWS ARE ENUMERATED AT THE BEGINNING OF EACH COUNTRY'S LAWS AND DISTINGUISHED BY CAPITAL LETTERS OF THE ALPHABET.

ABYSSINIA

(See also Map Section)

THIS historically famous country, more commonly known to the ancients as Ethiopia, is an empire, at present under the rule of the Empress Waizeru Zauditu. It includes the Kingdom of Tigré, Lasta, Amhara, Gojam, Shoa, Kaffa, Harar and portions of Galla and Somali Lands.

There are no wireless stations working within the Empire under native administration. There is a station at Gambeila ($8^{\circ} 15''$ N., $34^{\circ} 35''$ E.), which is maintained under supervision of the Sudan Government (*for Regulations, see under "Sudan"*). There is also a private wireless installation at the Italian Legation in Adis Ababa ($9^{\circ} 5''$ N., $38^{\circ} 45''$ E.). This station contains a Marconi wireless cabinet apparatus, wavelength for transmission 2,000 metres, for reception up to 15,000 metres. This installation communicates chiefly with Asmara in Eritrea.

ADMIRALTY ISLANDS

(See under NEW GUINEA, Territory of.)

AEGEAN ISLANDS

(See also Map Section)

Including: Egeo, Rhodes, Stampolia, Scarpanto, Caso, Piscopi, Misiro, Colimino, Liro, Patino, Cos, Simi, Calche, Lipso—The Dodecannese.

DURING the war of 1912 with Turkey, Italy occupied these islands as a base. The total population (1917) was 100,198. The Dodecannese comprised several small islands of the Sporadi group.

CONTROL AND ORGANISATION.

Owing to the disturbed political condition at the time of going to press no information is available regarding the control and organisation of wireless in the islands.

AFGHANISTAN

(See also Map Section)

SITUATED in Asia, Afghanistan lies roughly between the parallels of 29° and $38^{\circ} 20'$ N. latitude and 61° and 72° E. longitude, with a long narrow strip (Wakhan) extending to 75° E. longitude. It has an area of about 245,000 square miles.

A treaty between Great Britain and Afghanistan (November 22nd, 1921) to last for three years, recognises the complete independence of this state. It has a population of about 6,380,500.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information regarding wireless in Afghanistan.

ALASKA

(See under UNITED STATES OF AMERICA.)

ALBANIA

(See also Map Section)

THE independence of Albania or Skypanie, was declared on November 28th, 1912, and the autonomy of the state was agreed to on December 20th, 1912. Prince William of Wied was the recognised crowned head of the new state.

Albania is made up of the old Turkish Provinces of Scutari and Yanina and the vilayets of Kossovo and Monastir, and its present estimated area is about 11,000 square miles.

The European War completely upset the existing monarchy and the country fell into a state of anarchy, which, after being alternately in Austrian and Italian hands, is now governed by a Council of Regents, composed of a representative of each of the religious bodies of the country. It has a population of about 1,400,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information regarding wireless in Albania.

ALGERIA

(See under FRANCE.)

ANGOLA

(See also Map Section)

THIS Colony, otherwise known as Portuguese West Africa, possesses a coast line of over 1,000 miles and is bounded on the north by the French Congo, on the east by the Belgian Congo, and on the south by the Union of South Africa. The Colony has been in the possession of the Portuguese since 1575, with the exception of a period of seven years (1641-1648), when it belonged to Holland. The territory is under the jurisdiction of a High Commissioner, whose headquarters are at Loanda, the capital. It has an area of about 484,000 square miles and a population of 4,119,000.

CONTROL.

Radiotelegraphy in the Colony constitutes a Government monopoly. All matters in relation thereto are in the care of a Communications Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Commander Luiz Couceiro ..	Communications Secret ry	Loanda

There are also a number of station superintendents, telegraphists, electricians and mechanics. Up to the present no stations other than Government stations are allowed. There are no aviation or meteorological stations.

ORGANISATION.

The decree for the creation of a wireless service in the Province of Angola was gazetted in Lisbon on September 23rd, 1918. The scheme includes: One 15-kW. station at Loanda; twenty-two 3-kW. stations at Cabinda, Maquela, Encoge, Malange, Saurimo, Novo Redondo, Lobito, Huambo, Moxico, Caquengue, Mossamedes, Lubango, Mulongo, Cuanhama, Posto A, Cuangar, Cangamba, Caiundo, Dirico and Luati; nine 1½-kW. field stations (type F); two ½-kW. pack stations for the army.

There are, for public and official service, eight 3-kW. stations in work, situated respectively at Cabinda, Loanda, Novo Redondo, Lobito, Mossamedes, Malange, Huambo and Lubango. In Loanda there is a 15-kW. station. Stations are under construction at Maquela, Xa-Sengue, Saurimo, Camacupa and Moxico.

ADMINISTRATION.

The Laws, Regulations, etc., governing the administration of wireless telegraphy in this territory are identical with those used in Portugal.

ARABIA

(See also Map Section)

Including: the Kingdom of Hedjaz, the Emirate of Nejd and Hasa, the Emirate of Jebel Shammar, the Principate of Asir, the Imamate of Yemen, the Sultanate of Koweit and the Emirate of Kerak.

The major portion of Arabia consists only of desert and steppe entirely uninhabitable, the outskirts of which are occupied by Bedouin tribes. Oases form the only settled districts.

Its area is about 1,000,000 square miles, with a population of five to six millions.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information regarding wireless in Arabia.

ARGENTINE REPUBLIC

(See also Map Section)

ARGENTINE (Republica Argentina) is situated in the southern portion of South America between $20^{\circ} 50'$ and $55^{\circ} 19'$ south latitude, and possessing a longitude stretching from $53^{\circ} 41'$ to $70^{\circ} 56'$ west of Greenwich. It is the second in size of the republics of South America. The country was first visited by Spanish explorers in 1508, and remained a colony of Spain until 1810, when the natives commenced their struggle for independence, which was proclaimed by the Congress assembled at Tucuman in 1816.

This was followed by a long period of civil war until 1853, when a Republican government was constituted and the National Constitution elaborated, with modifications introduced in 1860, 1866, and 1898. Great Britain definitely recognised Argentine independence in 1825.

The total area of the fourteen autonomous provinces and ten national governments which go to make up Argentina comprises in all about 1,153,119 square miles. The capital city is Buenos Aires, situated on the Rio de la Plata. The census of 1921 gave the total population of the country as comprising 8,698,516 persons.

CONTROL.

The Radiotelegraphic Law, passed in October, 1914, definitely assigned the direction of wireless telegraphy and the public wireless service to the Ministries of Interior and Marine.

The Ministry of Marine has jurisdiction over zones extending as far as 100 kilometres from the sea coast and the Rio de la Plata and 50 kilometres on each bank of the navigable rivers. The rest of the country is under the jurisdiction of the Ministry of War.

The chief of the public maritime radiotelegraph service is the General Secretary of the Ministry of Marine, under the direct control of which is the "División Servicio Radiotelegrafico," which has authority over everything concerning radiotelegraphy within the maritime zone. Under the control of the Ministry of Marine there are 21 coastal radiotelegraph stations, which are of the Telefunken system modified in accordance with the necessities of the Navy. According to the latest information, they are:—

Commercial traffic with ships	16
Naval official traffic only	6
Public correspondence in the inland service ..	17
Official correspondence inland	2

There are also 75 ship stations.

Six new radiotelegraphic stations are being constructed.

The "División Servicio Radiotelegrafico" has its own radiotelegraph works which construct and repair the greater part of the apparatus used in the Navy. These works are also able to effect repairs to radiotelegraph apparatus of merchant vessels calling at Argentine ports.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Julio Moreno	Minister of Marine	Buenos Aires
Sr. Ricardo Ugarriza ..	Secretary-General of the Ministry and Chief of the Public Maritime Radiotelegraphic Service	Buenos Aires
Lt.-Col. Francisco Arnaut..	Chief of the Divisional Radiotelegraphic Service	Buenos Aires

The Supreme Government has granted four licenses to different companies to instal and work within the country high-power radiotelegraph stations intended for intercontinental radio communication. These companies are: the Compañía Marconi de Telegrafia sin Hilos de la Plata (English), which will place this country in communication with England; the Pan American Wireless Telegraph and Telephone Company (North American), which communicates direct with the United States; Transradio, Argentina, Radiotelegraphic Company, for service with Germany; and the Compagnie Générale de Télégraphie sans Fils, for service with France. These licenses last for a period of thirty years, at the end of which time the goods and installations possessed by the companies will be handed over to the power of the State without any indemnity.

There are also some private stations of very small energy, the installations of which are used solely for experimental purposes.

ORGANISATION.

The Station of Dársena Norte transmits daily to all ships and coast stations a news service, as does likewise the radiotelegraph "top" which gives the official time.

There are no special publications devoted to wireless.

ADMINISTRATION.

Below are given the law and regulations in force at the present time:—

- A—Law No. 9,127 regarding radiotelegraphy.
- B—Regulations made by the Executive Power for Radiotelegraphy.
- C—Decrees of the Executive Power amplifying the regulations.

LAW.

A LAW NO. 9,127 PASSED BY THE NATIONAL CONGRESS ON SEPTEMBER 16TH, 1913.

ART. 1.—The wireless service within the national territory, and for international communications within a minimum distance of 1,000 kilometres, shall be exclusively under the control of the State.

ART. 2.—The executive shall attend to the erection of wireless stations within the national territory, and shall so select the sites for the coast ones that all ships sailing near our coasts and navigating our rivers may always be in touch with them.

ART. 3.—The sum of \$400,000 national currency are hereby allocated to the above. This amount will be charged to General Expenses.

ART. 4.—The use of wireless apparatus in perfect working order is hereby declared compulsory for all ships calling at the ports of Argentina carrying fifty or more persons on board, counting the passengers and the crew, on and after ninety days have elapsed since he promulgation of this law.

ART. 5.—Wireless apparatus handled by skilled operators must have at all times a transmission power of not less than 200 kilometres for river craft, and not less than 500 kilometres for sea-going vessels.

ART. 6.—No ships will be allowed to leave port until the prescriptions of Arts. 4 and 5 have been complied with, and should the captain or the officer in charge try to elude or contravene this regulation, the superior local marine authority shall impose a fine of from 1,000 to 5,000 pesos. The party so fined can appeal to the federal magistrate of the district where the contravention has been committed. A double fine will be the penalty for a repetition of the offence.

ART. 7.—The Executive will promulgate the regulations in accordance with this law.

ART. 8.—The above Act of Parliament shall be communicated to the Executive.

The above was approved by the Argentine Congress in the city of Buenos Aires on the sixteenth day of September in the year of our Lord nineteen hundred and thirteen.

EXECUTIVE DECREE OF JULY 12TH, 1917.

This is divided into two parts. Of these Part I. only is printed.

PART I.

CHAPTER I.

SUB-SECTION I.

B ART. 1.—The "General Rules and Regulations for the Radiotelegraphic Service in the Argentine Republic," as issued by the Secretary-General of the Marine Ministry, are hereby approved.

ART. 2.—The following Regulations and Ordinances are hereby repealed:

Regulations for the Radiotelegraphic Stations of the Navy (December 1st 1906).

Regulations and Plan of Studies for the Radiotelegraphic Staff (November 27th, 1912).

Regulations for the Radiotelegraphic Service (July 5th, 1913).

Regulations for the Radiotelegraphic Service in the Argentine Republic (October 24th, 1914), and every other regulation affecting the Radiotelegraphic Service issued either as General Instructions, Orders of the Day or Circular Letters from the Marine Ministry, as from the year 1906 inclusive to this date.

ART. 3.—The necessary copies of the new Rules, as mentioned in Art. 1 to be printed.

ART. 4.—This decree to be communicated, published, etc.

(Signed) Irigoyen,

F. ALVAREZ DE TOLEDO.

The following are the documents approved by the Executive Decree above quoted:—

SUB-SECTION 2.

ORGANISATION OF THE RADIOTELEGRAPHIC DEPARTMENT.

ART. 1.—The Radiotelegraphic Service constitutes a Department of the General Secretaryship of the Ministry of Marine.

ART. 2.—The following duties correspond to this Department:—

(a) To intervene in everything affecting the military and public radiotelegraphic service depending from the Ministry of Marine and under its inspection and control.

(b) To intervene in the formation of reports and in the claims and suits that may be promoted.

(c) To study and comply with the international laws, regulations, instructions and conventions or pacts that may affect this service.

(d) To work in the reforms tending to improve the service both in connection with technical details and those of a purely disciplinary character.

(e) To intervene in the preparation of instruction plans and the examination of subordinate radiotelegraphists and civil operators, to propose their promotion and to issue the corresponding credentials (*patentes*).

(f) To intervene in the purchase of radiotelegraphic materials, giving advice and reporting on results.

(g) To attend to that part of the correspondence and intercourse with the Berne International Office referring to this service.

ART. 3.—The Radiotelegraphic Service Department will be divided into the following sections:—

(a) Inquiries, Correspondence, and Archives.

(b) Technical Inspection and Superintendency.

(c) Shop, Installations, and Repairs.

(d) Test of apparatus and materials.

(e) Accounting.

ART. 4.—The staffs in the land stations and in the floating lighthouses will be as permanent as consistent with the good service. The staffs will in matters affecting discipline, re-examination and licenses, be subordinate to the Secretary of the Ministry; but the last-named officer will see that the General Direction of Personnel is kept informed of the changes occurring in this service.

With the General Secretary rests the duty of putting before the General Director of Personnel any changes that may be considered necessary in the radiotelegraphic staffs on board units of the Navy.

CHAPTER II.

REGULATIONS GOVERNING THE RADIOTELEGRAPHIC SERVICE.

SUB-SECTION I.

JURISDICTION OF THE SEVERAL MINISTRIES ACCORDING TO LAW No. 9127.

ART. 1.—The national territory is hereby divided into two zones for the purposes of jurisdiction and regularisation affecting the service of radiotelegraphic installations. The aforesaid zones are as follows:—

(a) The *Maritime Zone*, which includes all ship stations in the maritime territorial waters and navigable rivers, besides all land stations situated within one hundred kilometres from the sea and River Plate coasts and those situated within fifty kilometres from the banks of any other navigable rivers.

(b) The *Terrestrial Zone*, which includes all other installations on national territory which are not covered by the above.

ART. 2.—(a) The Maritime Zone is under the jurisdiction of the Minister of Marine, who is responsible for the control of the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless service in this particular zone.

(b) The Minister of Marine shall also undertake the duty of transmitting all information of any nature which may be asked from him by the International Bureau of Berne.

ART. 3.—(a) The Terrestrial Zone is under the jurisdiction of the Minister of the Interior, who controls the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless in this particular zone.

(b) In special cases when a state of siege is declared, all installations in this zone shall be placed under the control of the War Office.

ART. 4.—Other Executive Offices can order the installation of wireless stations for their exclusive use, but in such cases the working of such installations must be authorised by the Minister exercising control in the respective zones, and the rules and regulations prescribed for the latter must be observed in these particular stations.

ART. 5.—All wireless installations erected in the national territory must observe the international rules and regulations adhered to by the Government of the Republic, and the General Law regulating the Telegraphic Service must be observed in all matters appertaining to the Public Radiotelegraphic Service.

SUB-SECTION 2.

PERMITS FOR THE INSTALLATION OF PRIVATELY OWNED RADIOTELEGRAPHIC STATIONS.

ART. 1.—Law 9127 having been passed with the object of nationalising of the wireless service, the installation of high-powered wireless stations by private individuals or corporations shall only be allowed in the national territory when such installations are destined for inter-continental communication.

ART. 2.—The granting of such concessions as authorised by Art. 1 corresponds to the Minister in whose jurisdiction the new station is to be erected.

ART. 3.—Where the Minister having control over the zone where the wireless installation is to be erected has given his consent, all the rulings of said Ministry, or any other of its decisions regarding the stations directly dependent on the said installation, must be obeyed unquestionably.

ART. 4.—In general it shall be the duty of the Minister of the Interior to negotiate the bases of agreements in course of conclusion with neighbouring countries, and he will communicate with the Minister of Marine the results arrived at in the course of such negotiations, so that the latter may give effect to any such conventions in so far as they affect his department. The Minister of Marine shall have the right of being consulted in the negotiation of the bases for such conventions.

ART. 5.—No radiotelegraphic (transmitting or receiving) station will be erected without obtaining first the necessary license from the Minister in whose jurisdictional zone the station is to be established.

ART. 6.—To obtain the license referred to in Art. 5, the installation must fulfil the following requirements:—

(1) The primary transmitting power must not exceed 50 watts.

(2) The wavelength must not exceed 300 metres in the transmitter.

(3) The receiver may be suitable to receive waves of any length, providing that the Executive Government have no objection thereto.

(4) The installation must not be used for any interchange of messages in the public service. It will be devoted to experimenting, and only when in the judgment of the Government no harm or disturbance would arise from its use to the nearest national stations can the installation send or receive special messages.

ART. 7.—Anyone infringing the rules set out in Arts. 5 and 6 will be penalised in accordance with the penalties established in the General Law relating to the National Telegraph Service.

ART. 8.—Private installations authorised in accordance with Art. 6 must be inspected by the official inspectors, who are entitled to all the information and data they may demand. These installations must be registered and the wireless apparatus must be stamped by an inspector. The Minister exercising jurisdiction in the respective zone can order at any time the closing of authorised private wireless installations.

SUB-SECTION 3.

REGULATIONS AFFECTING ALL INSTALLATIONS ON NATIONAL TERRITORY AND ON BOARD SHIPS.

ART. 1.—The power to be used in all installations on land will be limited to that

necessary for communication with the nearest stations in the system. Coast installations which must have high power in order to communicate at long distances are excluded from this limitation.

ART. 2.—(a) All installations open to public service must receive all messages sent by stations under the control of any Ministry or by any of the National Telegraph offices, provided that the regulations established by each administration regarding the radiograms which may go over their lines are complied with at the original stations from which the messages are radiated.

(b) Foreign vessels under the flag of a country which has not adhered to the London Convention will be allowed to communicate with Argentine coast and stationary ship stations, provided the agents representing the Company owning such foreign ships ask for the extension of this privilege and fulfil all the requirements established by the present Regulations and by the London Radiotelegraphic Convention.

ART. 3.—Radiograms will be transmitted in the order of priority established by the Law on National Telegraphs and the Radiotelegraphic Convention, namely:—

(a) Distress calls have absolute priority upon any other communication; then follow:—

(b) Service notices of whatever origin when referring to "the Safety of Life at Sea" or containing information of an urgent character for navigation.

(c) Messages from the Executive Government.

(d) Service notices from the Radiotelegraphic stations.

(e) Messages from the Ministry of Marine, its dependencies and its fleets.

(f) Service notices from the shipping companies.

(g) Private messages.

ART. 4.—In accordance with Art. 101 of the Law on National Telegraphs, messages belonging to the same category will be transmitted by the station of origin in the order in which they are delivered to this station, and by the relay stations, in the order in which they are received.

ART. 5.—In accordance with Art. 102 of the Law on National Telegraphs, private messages stamped as urgent in the "telegraph" system, should have priority in transmission, even upon messages of a superior category not stamped as urgent.

ART. 6.—Any radiogram referring to the internal service of a fleet, squadron or division in march, will be considered as urgent and transmitted accordingly.

ART. 7.—Every official unprepaid radiogram or telegram sent by Marine officers with authority to do it, will be signed with the corresponding telegraphic address, and such messages will be legalised outside their text with the seal and signature of the competent officer on land or on board.

ART. 8.—The following is a list of Marine Officers who are authorised to send unprepaid radiograms and telegrams, according to the Navy Disciplinary Regulations:—

Secretary-General of the Ministry.

Chief of the Radiotelegraphic Department.

Chief of the Hydrography, Lighthouses and Buoy Department.

Inspector of the Marine Ministry's Dependências in Tierra del Fuego and Cabo Virgenes.

Director-General of Personnel.

Director-General of Material.

Director-General of Administration.

Prefect-General of Ports.

Prefects of Maritime and River Zones.

Director of the Naval School.

Director of the Training School.

Director of the Mechanics School.

Chiefs of Fleets, Divisions, Squadrons, Light Squadrons or Groups.

Chiefs of Staff of Squadrons and Divisions.

Chiefs of Shipyards and Maritime Zones.

Chief of the Aviation Grounds in "Fuente Barragán."

Commanders of Ships.

Commander of the Marine Depot (*Depósito de Marina*).

Command of Coast Artillery and "Martin García."

Managers of Coast Radiotelegraphic Stations.

Managers of Lighthouses and Director of the "Año Nuevo" Observatory, when addressing the Chief of Hydrography, Lighthouses and Buoys, or the sectional chiefs in his jurisdiction.

Sub-Prefects and their Assistants when addressing the Prefect-General or the jurisdictional Prefect.

The lists of officers belonging to other branches of national service and who have authority to forward unprepaid messages will be communicated to the Radiotelegraphic Offices when necessary.

ART. 9.—The Manager of a station may demand from any sender of a radiogram proof of his identity before transmitting the message, acting in accordance with Arts. 82 and 83 of the Law on National Telegraphs of 1875.

ART. 10.—In order to improve the service and with a view to regulate the exchange of radiograms between units of the Navy, coast stations, and foreign ships—strictly following the regulations established by the London International Radiotelegraphic Convention of 1912—the Radiotelegraphic Stations belonging to the Navy—whether opened or not to the public—will act in the way hereinafter detailed to make their calls, answers, transmissions, requests of rectification, repeats and notices of reception—viz.:—

1. Calls.

Every call is made up by the sign —●—●— followed by the letters of the station to be called, repeated three times, and by the word "de" (—●—●—), followed by the call letters of the calling station repeated three times.

Example of a Call.—Station LIA calls station LIC thus: —●—●— LIC LIC LIC —●—●— LIA LIA LIA.

2. Answers.

The station that is being called answers thus: The sign —●—●— followed by the call letters of the calling station, repeated three times; then the word "de" followed once by the call letters of the called or answering station, and ending with the sign —●—●— (invitation to transmit).

Example of an Answer.—Station LIC answers its call to station LIA inviting the latter to transmit its communication, thus: —●—●— LIA LIA LIA —●—●— LIC —●—●—

3. How to Transmit a Radiogram.

The following are the elements in which is divided every radiogram:

1. Sign of attention —●—●—●—
2. Preamble.
3. Supplementary Service instructions, if any.
4. Address.
5. Text of the radiogram.
6. Signature.
7. Signal of end of message —●—●—●—
8. Call letters of the transmitting station.

If there are several radiograms to transmit these letters will be sent only after the last message.

The Preamble of a radiogram is composed as follows:—

- I. The word "Radio."
- II. Class of the radiogram.
- III. Category of the radiogram. (Class and category are expressed by a group of letters called *prefix*.)
- IV. Name of the office of origin.
- V. Number of the radiogram.
- VI. Number of words.
- VII. Date and hour in which the radiogram was received for transmission.
- VIII. Service instructions.
- IX. Sign —●—●—●— (Double hyphen).

Supplementary service instructions are those which are transmitted upon request from the sender, and are charged for.

The following order will be observed in the transmission of every radiogram:

Preamble:

1. Sign of attention —●—●—●—
2. The word "Radio."
3. Class of the radiogram.
4. Category of the radiogram.
5. Name of office of origin.
6. Number of the radiogram.
7. Number of words.
8. Date and hour in which the radiogram was received for transmission.
9. Service instructions.
10. The sign —●—●—●—

Supplementary Service Instructions:

11. Supplementary service instructions (if any).

12. The sign —●—●—●—

Address:

13. The address (which will have at least two words).

14. The sign —●—●—●—

Text:

15. The text of the radiogram.

16. The sign —●—●—●—

Signature:

17. Signature.
18. Signal of end of message —●—●—●—
19. Call letters of the transmitting station.

Examples.—1. At 8.15 a.m. of the 15th of a month was delivered at the TORO station a radiogram for transmission, as follows: Lopez Sarmiento 667 Buenosaires. Send by fast freight 10 cases Viscosine oil. Suárez.

The above radiogram will be transmitted in the following order: —●—●—●— Radio (prefix of class and category) TORO. 175 13 15 8.15 m. —●—●—●— López Sarmiento 667. Buenosaires —●—●—●— Send by fast freight 10 cases Viscosine oil —●—●—●— Suárez —●—●—●— LMP.

2. The Radiotelegraphic installation of "Dársena Norte" receives the following message on the 25th at 8.15 p.m. from Morón for Benítez, steamship Rawson: On arrival you will find letter and documents asked for. Rod-

riñez." This radiogram will be transmitted thus: — Radio (prefix) Morón 16 14 25 8.15s. — Benítez Steamship Rawson — On arrival you will find letter and documents asked for — Rodríguez — LIA.

3. Example of a radiogram from the ship *Cabo Corrientes*, on the 15th at 3 p.m., to be transmitted to Berlin, via Monrovia, and reading: Schroeder Umlandstrasse 35 Berlin. Send motor type DRS to HP. Wagner. This message will be transmitted thus: — Radio (prefix) Cabo Corrientes 25 11 15 3 s via Monrovia — Schroeder Umlandstrasse 35 Berlin — Send motor type DRS to HP. — Wagner — LMO.

4. Notice of Reception.

When the receiving station receives a radiogram and has verified the number of words stated in the preamble, notice of reception must be given in this form:

"Call letters of the transmitting station followed by the word *de* (from) followed by its own call letters. Then the letter *R*, the number of the radiogram and the sign to indicate end of transmission — or end of work —, as the case may be.

Example: — LIA de LMX R 76

5. How to ask for a "Repeat."

The method to ask for a repeat will be the following:—

"The characteristics of the transmitting station will be sent followed by the word *de* (from), and then by the characteristics of the receiving station, and the combination QTA followed by the number of the radio."

Example: — LIA de LMX QTA 77

If only a part of the radiogram is to be repeated, the message will be: — LIA de LMX QTA 78 desde (from)

Should the receiving station have any doubt as to the radiogram received or the number of its words, a rectification may be requested thus:—

"Sign of attention —; call letters of the transmitting station, once; the word *de* (from); call letters of the receiving station; the combination QTC; the number of the radiogram to be rectified and the sign —"

Example: LMX asks from LIA the rectification of radiogram 71: — LIA

Station LIA answers: — LMX

Here the letters and figures *r*, *z*, *p*, *2*, *v*, *w*, *k*, *r* are the initial letters of each word and the first figures of each number.

6. How to Express the Number of Words.

When the actual number of words signalled is not the same as the number of words charged for, the fact should be expressed as a common fraction in which the numerator will indicate the number of words charged for and the denominator the actual number of words transmitted.

Take as an example the following radiogram: Alvarez Calle Corrientes 725 Buenosaires. Ship immediately; 100 litres benzine, 5 kilograms oakum, 5 kilograms Viscosine oil Suárez 22/18 (22 — 18).

The real number of words in the message is 18, but the three punctuation marks and the underline are counted and charged as words.

7. How to give the Date and Hour.

The date and the hour will be indicated by two groups of figures: the first group will represent the date of the month, and the second the hour and minutes followed by the letter *m* or the letter *s*, as the case may be, meaning *before noon* and *after noon*, respectively.

For instance, in a message received for transmission the 15th of the current month at 4.36 p.m., this information will be given thus: 15 4.36 s.

8. How to Use the Sign —

Hereafter the sign — will be used to represent the double dash (=), and not as heretofore to represent the letter *elle* (*ll*). This letter *ll* will be represented from now on by two consecutive *elles* (*ll*) (—).

9. How to Request a Station to Wait.

When a coast station is not ready to receive a number of radiograms after the preliminary communications from a ship, as detailed in Art. XVIII of the Rules annexed to the London Radiotelegraphic Convention of 1912, the land station will have to instruct the ship to wait, and such instructions will be communicated in the following manner:

— LMO — LIA —

This means that the station LIA acknowledges receipt of communication from station LMO, and using the service TR notation informs LMO that it has 50 words to communicate, and begs the ship station to wait ten minutes. In these communications the figures will be transmitted using the abridged notation.

10. Use of TR Notation.

Service communications will be preceded by the TR notation.

ART. 11.*—When the text of a radiogram is totally or partially in plain language, the following information will be given in the radiogram:—

1. Total number of compound words as a basis for the charge.
2. Number of plain words in plain language or with a conventional meaning.
3. Number of groups of figures or letters, expressed thus:

20/12/6.

This rule applies specially:—

(a) When a radiogram in plain language contains words of more than 15 letters (international system of counting words) or more than 7 syllables (according to our national rule).

(b) When a radiogram in code language contains words with more than 10 letters.

(c) When the radiogram contains groups of figures or letters of more than five characters.

ART. 12.—A radiogram must not contain more than 100 words. If the sender needs more words he must divide his communication in as many messages as necessary to comply with the above rule, and these radiograms will be transmitted alternatively with those from other senders presented for the next turn.

Official unprepared radiograms must not contain more than 50 words.

* This article and the article following would appear to be intended to apply rather to purely Argentine working, as they seem inconsistent with the provisions of the International Telegraph and Radiotelegraph regulations.

ART. 13.—(a) Radiotelegraphic messages transmitted, relayed or received will be kept in the utmost secrecy, as well as the note books, traffic sheets, reports and liquidations of accounts. It is forbidden to divulge the contents of communications intercepted during service hours, even if they do not affect the national public service or the naval service.

(b) If an intercepted radiotelegram contains damaging statements affecting national interests in land or at sea, the information must be communicated at once to the superior of the operator picking up the message, and this operator must keep a memorandum of the text and address of the radiogram concerned.

ART. 14.—It is the duty of every radiotelegraphist to communicate without delay to his superior the contents of intercepted radiograms containing excitations to revolt or affecting the safety of the nation. This information must be transmitted by the superior officer to a competent authority.

ART. 15.—Radiotelegraphic communications, like ordinary telegrams, are confidential; therefore, persons not belonging to the staffs shall not be admitted into the stations.

ART. 16.—In cases referring to the Radiotelegraphic service, not covered by these regulations, the international radiotelegraphic conventions and the Law on National Telegraphs will apply. But if a rule or regulation is not found, the case must be submitted in consultation to the nearest (superior) office or to the Radiotelegraphic Department.

To ensure a good service, it is the duty of coast stations to give to ship stations all the information they may require.

ART. 17.—Radiograms will be delivered following the rules contained in Art. 32 of the Law on National Telegraphs.

SUB-SECTION 4.

CHIEF OF THE PUBLIC MARITIME RADIO-TELEGRAPHIC SERVICE.

ART. 1.—The Secretary-General of the Ministry of Marine shall have under his control the Public Radiotelegraphic Maritime Service and his duties will be as follows:—

(a) He shall supervise all coast stations and ship stations after installation, both of national and foreign register, calling at national ports, and shall also supervise all coast stations, as prescribed in Article 2 of Law 9127.

(b) He shall control the service of the said stations and will draft the regulations for same, taking care that the rules herein established and the international Conventions accepted by the National Government are duly fulfilled.

(c) He shall see to it that all regulations concerning rates, discounts and reimbursements, as well as any others that may be later on prescribed by the Post and Telegraph Office regarding the requirements of radiograms relayed to the National Telegraph lines are faithfully complied with.

(d) He shall forward to the Office of Posts and Telegraphs all claims made to the Prefect-General of Ports by Steamship Companies, ship captains or passengers referring to rates, discounts and reimbursements.

(e) He shall issue through the Office of the Prefect-General of Ports the permits for the erection of wireless on board those ships which may have obtained leave to do so in accordance with these Regulations.

(f) He shall issue licenses to the wireless telegraphists operating at all stations working within the Maritime Zone, so soon as the conditions affecting such licenses have been fulfilled in accordance with these Regulations.

(g) He shall cancel such licenses and permits granted to stations and operators within the Maritime Zone as it may, for a good reason, be found necessary to withdraw.

(h) He shall enforce, through the Office of the Prefect-General of Ports, the payment of all fines imposed on shipping companies or ships, and shall direct the deposit of the said fines in the National Bank to the order of the Director of Posts and Telegraphs.

(i) He shall have it in his power to authorise the installation of wireless by private individuals or corporations within the Maritime Zone in accordance with Chapter II, Sub-section 1, Art. 5.

ART. 2.—The head of the Public Maritime Radiotelegraphic Service shall act jointly with the Director of Posts and Telegraphs in the following matters:—

(a) In all matters referring to wireless stations installed on the Maritime Zone.

(b) In all matters referring to rates, discounts and reimbursements of the Public Radiotelegraphic Maritime Service in order to obtain a monthly settlement of accounts by the shipping companies or ship captains with the Office of Posts and Telegraphs in conformity with the schedules prepared by the latter.

(c) In the investigation of any questions that may arise for consultation from the Wireless International Service. In all such cases, the Office of Posts and Telegraphs shall communicate with the foreign administrations and authorities concerned.

ART. 3.—The Director of Posts and Telegraphs shall deal directly with the Secretary-General of the Ministry of Marine in all cases relating to the Maritime Radiotelegraphic Service.

ART. 4.—The necessary instructions to give effect to the provisions of Art. 1, paragraph (c), and all other regulations concerning the internal management of the radiotelegraphic stations in this jurisdiction, will be issued through the Department of Radiotelegraphic Service. These instructions shall be communicated to the stations by means of private circulars.

SUB-SECTION 5.

THE GENERAL OFFICE OF THE PREFECT-GENERAL OF PORTS.

ART. 1.—The duties of the Prefect-General of Ports will be as follows:—

(a) He shall give effect to the provisions made in Articles 4, 5 and 6 of Law 9127 and shall direct the deposit at the Bank of the "Nación Argentina" of the fines imposed for the non-fulfilment of said provisions. The money so deposited must be placed to the order of the Director of Posts and Telegraphs.

(b) He shall receive from shipping companies, captains or passengers all complaints regarding unsatisfactory service in the coast and ship stations, and shall forward them to the head of the Maritime Radiotelegraphic Service.

(c) Should any complaints be made upon the arrival in port of any vessel, the Prefect shall collate the evidence and forward it to the head of the Naval Radiotelegraphic

Service, and he shall act in the same manner should the complaints be made in writing.

(d) He shall prevent the departure of any ship which may have failed to make the necessary deposit at the National Bank (to the order of the Director of Posts and Telegraphs) of the fines imposed in accordance with Article 6 of Law 9127.

(e) Both upon the arrival and departure of merchant ships the Prefect shall have the wireless installations inspected in order to ascertain whether they are in perfect working order and whether the power of the apparatus is that fixed by Law 9127.

ART. 2.—The General Office of the Prefect-General of Ports will refer all matters concerning ship stations to the Director of the Public Maritime Radiotelegraphic Service.

ART. 3.—Besides the inspection and control of ship stations in territorial waters and on craft of all register the general office of the Prefect-General of Ports must attend to the following:—

(1) The dismantling of the transmitting apparatus of the wireless installation as soon as the ship has moored or anchored.

This precaution could be dispensed with, with the consent of the Maritime authority, in the ports of the Southern Coast and in river ports, where no radiotelegraphic land stations are in existence.

(2) He shall ascertain whether the wireless operator or operators have licenses corresponding to the installation they are working, in conformity with Article X of the Service Regulations annexed to the London Convention.

(3) In such cases as those covered by Article XII of the Service Regulations above mentioned, the Prefect-General of Ports shall act jointly with the Director-General of Supplies of the Ministry of Marine in order to give effect to the provisions of the said Article.

ART. 4.—First contraventions of the provisions of Art. 5, paragraph 1, will be recorded by the General Office of the Prefect-General of Ports, and each of those following the first will cause a fine of one hundred pesos, national currency.

SUB-SECTION 6.

COAST STATIONS.

Under the Control of the Head of the Public Maritime Radiotelegraph Service and Open to Public Service.

ART. 1.—The internal service of these stations will be subject to the provisions of these Regulations and those that may be brought into force subsequently.

ART. 2.—Coast stations not open to public service may or may not be shown in the Official Nomenclature as deemed expedient by the Ministry of Marine.

ART. 3.—Radiotelegrams must be deposited by the public at telegraph offices, but radiotelegraphic coast stations subject to the Ministry of Marine will receive direct, and within the regulation hours telegrams presented by the public at such stations when there does not exist a telegraph office in the locality or in the event of such telegraph office being without communication with the remainder of the system.

Exception from this provision is made for private radiotelegrams from the personnel of the Navy and addressed to stations of the Ministry of Marine, and such radiotelegrams, whether or not there is a telegraph office at the

place of origin, may be despatched on prepayment of the relative tariff from any radiotelegraph coast station under the control of the said Ministry.

The radiotelegrams referred to in the first paragraph shall follow this route, namely:—

(a) Messages originating from a telegraph office shall continue transmission by the telegraph route as far as the place where is situated the radiotelegraph coast station that is to transmit them to a ship or to the coast station which is nearest that of destination.

(b) Messages handed in by the public at coast stations shall be transmitted by wireless route to the nearest telegraph office having expeditious communication, and thence by the telegraph system to the point of destination or to the other coast station that is to transmit them to the ship station.

(c) Radiotelegrams to ship stations that are within the range of the coast stations from which they originate will be interchanged direct.

With regard to radiotelegrams deposited by the public at coast stations, and destined for a place in the interior of the country or abroad, and those messages which, owing to interruption of the telegraph line with the point of destination, are handed in at a telegraph office for transmission by wireless route, will be accepted only conditionally.

ART. 4.—Coast stations will accept and retransmit traffic handed over to them by the National Telegraphs, when such traffic cannot reach its destination in due course, by reason of interruption or congestion of its lines. Either of these two circumstances will be communicated directly by the Chiefs of the District to the Officers in Charge of the stations, who will also be advised of the extent of the interrupted sector, or in case of congestion, the number of messages to be retransmitted by the wireless route in order to normalise the traffic. In case of lack of communication between the telegraph office and its head office, the Chief of the former will directly request the co-operation of the interchange radiotelegraph station, making known this circumstance.

In case of interruption or congestion of the lines south of Bahía Blanca, messages from and for Punta Arenas will be retransmitted by stations of the radiotelegraph system only in the event of their destination or origin being any of the offices comprised between Bahía Blanca and Ushuaia.

ART. 5.—If, although there exists at the place where the message is handed in a National Telegraph Office, having efficient communication, or when the message could be retransmitted to destination by the telegraph lines, the sender should, nevertheless, prefer the radiotelegraph route, over the greater part of its transmission, the message will be charged double the ordinary tariff collected by the National Telegraphs in respect of inland telegrams, without prejudice to other taxes that may be applied, calculated according to general rules.

ART. 6.—The men of the Navy shall be able to make use of the wireless system over the greater part of the route from any radiotelegraph station under the control of the Minister of Marine on payment of double the ordinary tariff as mentioned in the previous Article.

Crews and passengers of mercantile vessels of Argentine registry will enjoy the same privilege on payment of the double coast tax.

ART. 7.—Coast stations will not accept from the public messages in secret language unless they have been previously visé by the Chief of the Telegraph Office of the place.

ART. 8.—Messages for the "Press, Stock Exchange and Commercial Centres" will not enjoy the half-rate concession that applies to transmission over the national telegraph lines, if the sender should prefer the radio-telegraph route.

ART. 9.—Public messages received by radio-telegraph stations will be delivered, without exception, to the nearest Post Office for distribution.

ART. 10.—The prefix "D P X" will be employed for those public messages whose senders have paid the double tariff or coast charges indicated in Articles 5 and 6. Such messages will have priority of transmission by the wireless route over other public messages.

ART. 11.—The hours which will be in force at coast stations, as regards attention to the public, will be from 8 a.m. to 8 p.m., both in winter and summer.

ART. 12.—For the supervision of the radio-telegraph service and control of the fulfilment of everything specified in the International Radiotelegraph Convention of London, and of the present regulations, on the part of all radio-telegraph stations, whether ship stations or coast stations in the maritime zone, the undermentioned are designated as stations of control: Dársena Norte will control the port of Buenos Aires and the vicinity.

La Paz will control the port of Rosario and the vicinity.

Rio Santiago will control the port of La Plata and the vicinity.

Puerto Militar will control its own port and Bahía Blanca and the vicinity.

Cabo Virgenes will control the south coast.

ART. 13.—In the territories of Santa Cruz and Tierra del Fuego the control over the radio-telegraph service will be exercised by an inspector appointed by the Ministry of Marine.

ART. 14.—For the purpose of accounts, the coast station will be considered as the terminal station in respect of radiotelegrams emanating from the national radiotelegraph service for ship stations, and shall be considered as stations of origin for those messages emanating from ships.

ART. 15.—Coast stations shall accept with absolute priority distress messages made by ships and shall transmit them as "Urgent" messages over the land system.

ART. 16.—Coast stations shall not despatch any official radiotelegram by the lines of the National Telegraphs emanating from vessels or departments of the Ministry of Marine which can reach its destination without such requisite. Exception is made as regards official urgent radios which may be delayed by interruptions in the radiotelegraph transmission due to atmospheric perturbations or other causes. Nevertheless, according as services may allow they will be transmitted by the wireless route.

ART. 17.—When a vessel of the National Navy shall transmit the "Interruption" signal — • • • • • repeated several times and followed by her call signal, national merchant vessels and coast stations shall suspend all communication immediately, excepting in cases of shipwreck.

This signal of interruption, which is designated as "Naval Service," shall only be used on the order of the commander of the vessel and shall be employed only in urgent cases that do not permit the normal service wait.

ART. 18.—Apart from cases of shipwreck, the station of Dársena Norte has precedence over the others. When that station transmits the

interruption signal, all land stations and ships shall suspend their communications to enable the station of Dársena Norte to work without interruption.

ART. 19.—The radiotelegraph coast stations of the State performing the service of the National Telegraphs shall also observe an internal timetable between themselves for the interchange of radios of the public service.

ART. 20.—All national ship and land stations shall suspend their communications during the time that the stations designated for the purpose are transmitting the "Top Radiotelegráfico."

ART. 21.—This decree to be communicated, published, etc., etc.

SUB-SECTION 7.

NATIONAL WARSHIP STATIONS.

ART. 1.—Warship and coast stations shall use for official messages the maximum wavelength possible for their aerials, and should they have to transmit messages to Argentine merchantmen or to foreign merchant steamers they must use the wavelengths specified by the London Convention and by these Regulations.

ART. 2.—In order to avoid difficulties in the general radiotelegraphic service arising from the use by and between Navy units employing Wireless, and which work with the normal wavelength (600 metres)—thus producing interruptions that prevent the reception of other radiograms—this method will be followed, namely:—

1. For Wireless communications in general, between Navy units, their station shall employ the following wavelengths:—

1,000 METRES: Ships *Moreno, Rivadavia, General San Martín, General Belgrano, Pueyrredón, Garibaldi, Buenos Aires, 9 de Julio, Presidente Sarmiento, Pampa, Chaco.*

450 METRES: Ships *Almirante Brown, Libertad, Independencia, Paraná, Rosario, Patria, Córdoba, La Plata, Catamarca, Jujuy, Entre Ríos, Misiones, Corrientes, Guardia Nacional, 1° de Mayo, Ministro Escurre, Alférez Mackinlay, Ona, Querandí, Azopardo, Piedra Buena, Vicente Fidel López, Uruguay, and Gaviota.*

2. When the distance between ships does not allow of the establishment of wireless communication with the wavelength mentioned above (No. 1) the operator shall use the efficient wavelength that his apparatus may permit.

3. The normal 600 metres wavelength shall be used exclusively for general service between ships and land stations, national or foreign.

4. After the radiotelegraphic communication is established by any means as mentioned above (Nos. 1 and 2), the operator shall endeavour to work, considering the range, with the minimum power required for obtaining effective communication in accordance with the provisions of the London Radiotelegraphic Convention.

5. The syntonisation of the radiotelegraphic stations on board ships of the Navy, shall be controlled and regulated by the Radiotelegraphic Service Department, in accordance with the wavelengths established by Art. 1, and taking into consideration the normal wave of 600 metres.

SUB-SECTION 8.

WIRELESS ON MERCHANTMEN.

ART. 1.—All merchant vessels, whether mechanically propelled or otherwise, carrying fifty or more persons (passengers and crew)

must be fitted with a wireless installation in perfect working order, except in the cases referred to in Articles 4, 5 and 6, below.

The above applies to all craft in similar conditions entering or leaving Argentine ports.

ART. 2.—Wireless apparatus in charge of an efficient operator must have at all times a transmitting power of no less than 200 kilometres for river craft and of no less than 500 for sea craft.

ART. 3.—No ships will be allowed to clear when the above provisions have not been duly complied with, and should captains or ship masters endeavour to avoid or contravene this rule the Superior Port Authority can impose a fine of not less than 1,000 pesos and not exceeding 5,000. Those penalised in that way can appeal to the Federal Court having jurisdiction on the locality where the fault has been committed. The fine will be doubled in cases of repetition of the offence.

ART. 4.—Ships exclusively navigating the rivers of the Republic are exempted from the obligation of carrying wireless on board, but those plying between Argentine and Uruguayan ports on the River Plate and those employed in the coasting trade must carry radiotelegraphic installations.

ART. 5.—The following are the exceptions to the rule established by Article 1:—

(1) Those ships which only by accident or under exceptional circumstances carry fifty or more passengers, either because the captain has been obliged to get extra help in order to replace the sick members of the crew, or because he has taken aboard the passengers and crew of some vessel in distress.

(2) Those ships on which, by reason of the route they follow or because of the conditions on which they set out to sea, it may be considered that the carrying of a wireless installation would be useless and superfluous.

(3) Those ships where the number of passengers may be raised by exceptional or accidental circumstances to 50 or more, owing to their having received on board these additional passengers in the course of the voyage for the purpose of transhipment, with the additional proviso that such vessels do not go farther than 150 miles from the nearest coast.

(4) Sailing ships of primitive construction such as pontoons and lighters, when it is impossible to fit them with wireless.

ART. 6.—Vessels which have started their voyage without meeting the requirements of these regulations cannot be observed or attended to if, by reason of bad weather or through *force majeure*, they are compelled to seek refuge in Argentine ports.

ART. 7.—All foreign ships carrying wireless installations are divided into three classes according to the classification made regarding ship stations in Article XII of the Regulations annexed to the Radiotelegraphic Convention signed in London on July 5th, 1912. These classes are:—

FIRST CLASS.—Vessels carrying a permanent wireless service.

All vessels fitted to carry 25 or more passengers are included in the *First Class*—

(1) If their average speed be of 15 knots or more.

(2) If they have an average speed of over 13 knots; but only provided they carry 200 or more persons (passengers and crew), and provided also that they traverse a distance of more than 500 nautical miles

between two ports of call. These ships, however, may be classified under the second class provided that they maintain a continuous watch.

SECOND CLASS.—Vessels having a limited wireless service.

Those ships fitted to carry 25 or more passengers which for some other reasons may not have been included in the first class are included in this second class.

All ships of the second class must, whilst at sea, keep continuous watch during seven hours every day, and watch also for ten minutes at the beginning of each of the remaining seventeen hours.

THIRD CLASS.—To this class belong those ships, national or foreign, carrying a wireless installation without any fixed working hours or not included in the first and second classes.

The owner or builder of a ship included in the second or third class has the right to demand that in the certificate of safety issued to him mention be made of the fact that the ship belongs to a higher class, provided the vessel fulfils the requirements laid down for the higher class.

ART. 8.—National and foreign ships carrying wireless must keep a constant watch in the following cases:—

(1) Passenger ships running to Montevideo.

(2) All ships belonging to the first class.

(3) Ships belonging to the second class, whenever they are at a distance of over 500 miles from the nearest coast.

(4) (a) Ships carrying more than 50 persons and which, by reason of their movements, are obliged to navigate at a distance of over 1,000 miles from the nearest coast.

(b) Fishing craft, including whalers, on board of which wireless telegraphy must be carried, are not obliged to keep a continuous watch.

(c) The continuous watch above referred to must be carried out by two or more first-class qualified telegraphists, as provided for in Article X of the Regulations annexed to the Convention.

ART. 9.—Any ship which must carry wireless and which is classified in the first or second class must have an emergency installation, in accordance with Article XI of the Regulations annexed to the Radiotelegraphic Convention.

In every case, the emergency installation shall be placed in its entirety on the upper deck of the ship and should be located as high up as possible.

The emergency installation must have a source of energy of its own, must be of such a nature that it can be set in motion very rapidly, and must be capable to work for a minimum of six continuous hours and possess a range of 150 kilometres.

This emergency installation is not required in the case of those ships whose *normal* installations fulfil all the requirements demanded by this Article (as enumerated in the preceding clause).

The license referred to in Article IX of the Regulations annexed to the International Radiotelegraphic Convention cannot be granted if the installation fails to comply with the requirements demanded by the said Convention and by the present Regulations.

ART. 10.—All points raised in the Radiotelegraphic International Convention and its Regulations which affect ship stations, the transmission of messages, and the issue of

certificates to wireless operators, are governed by the following:—

(1) The Rules laid down in the above-mentioned Convention and its Regulations, as well as all the amending Regulations which may from time to time be substituted for them.

(2) The present Regulations whenever their provisions can be considered as additions to the above.

SUB-SECTION 9.

RULES FOR WIRELESS INSTALLATIONS ON NATIONAL MERCHANTMEN.

ART. 1.—All Shipping Companies whose vessels are included in the Regulations laid down in Wireless Law No. 9127 must obtain a permit from the Ministry of Marine and through the Prefect-General of Ports for the installation of wireless stations on their ships.

ART. 2.—Wireless stations on national ships devoted to the conveyance of passengers will be classified as belonging to the first class, and wireless stations on cargo boats will be included in the second class (Article XIII of the Service Regulations annexed to the Wireless Convention).

When Shipping Companies apply for permission to instal wireless in their vessels they must indicate the class occupied by such vessels, and this classification must be verified by the Office of the Prefect-General of Ports before forwarding the application to the Secretary-General of the Ministry of Marine.

ART. 3.—As soon as the permit has been granted, and immediately after the stations have been erected on the ship, the company must notify the Prefect-General of Ports, so that the latter may—after previous inspection by the wireless inspector—issue the corresponding license through the Chief of the Maritime Wireless Service. This license will be handed over as soon as the charge of 5 pesos (national currency) for the defrayment of expenses has been paid.

ART. 4.—The Ministry of Marine will grant the license:—

(a) If the wireless installation fulfils all the requirements of the law in the matter of range and also if the installation belongs to a system permitting of its being tuned to the wavelengths specified in the London Wireless Convention, within an approximation of 5 per cent.

(b) If a deposit to the order of the Director General of Posts and Telegraphs has been made in the "Banco de la Nación Argentina" of the amount previously fixed by this office as a guarantee for the exchange of radiograms. This deposit must amount at least to one hundred pesos, national currency.

(c) The depositors shall not dispose of the deposit (as provided in (b)) unless they previously notify the administration that their vessels are going to discontinue their registered service, and that sufficient time has elapsed to effect the final liquidation of accounts for radiograms exchanged.

(d) Stations on board ships from a country with which no agreements have been entered into for the exchange of radiograms (between our stations and its ships), will be subject to the conditions (b) and (c). In this case the deposit must be made, before any service is rendered, by the agents of the shipping company owning the vessel.

ART. 5.—Wireless installations on ships belonging to the national merchant service must be furnished with the following papers:—

(1) The license authorising the installation.
(2) One copy of the London Wireless Convention.

(3) One copy of the Wireless Law.

(4) One copy of the Wireless Regulations.

(5) The Official List of Wireless Stations, and alphabetical list of call letters.

(6) Radiogram forms.

(7) One copy of the standing wireless rates, which must be kept where it can be plainly seen.

(8) One slate, placed outside the wireless cabin, so that the names of those stations within range may be noted thereon for the information of the public.

ART. 6.—The stations on board national merchantmen must be disposed in such a way that the State's stations may receive the waves emitted by the former.

ART. 7.—Radiotelegraphists are forbidden to operate in unlicensed stations.

It is their duty to report to the Prefect-General of Ports any tentative to compel them to disregard this prohibition.

ART. 8.—(a) When a "license" is issued the station receives its call letters, which will be published in the Official List of Radiotelegraphic Stations issued by the Berne International Telegraphic Bureau.

Stations licensed for public service "must not use," not even for private purposes, other call letters than those assigned them by the Director of the Maritime Public Radiotelegraphic Service.

(b) The operators in charge of the stations will be responsible for any infringement of the above provision.

ART. 9.—(a) Operators in charge of public service stations are responsible to the Director of the Maritime Public Radiotelegraphic Service for the fulfilment of the provisions contained in the Regulations in force at the time and in the International Radiotelegraphic Convention.

The manager of a station is the chief of the staff serving in the same, and if it is a ship station the manager is responsible to the ship's captain.

The operator in charge of a ship station owes obedience to the captain, and if the latter gives an order against the rules or the International Convention, the operator has the right, acting with tact and courtesy, to call the captain's attention to the fact, pointing out to him at the same time how to avoid the infringement of the rules in carrying through the order received.

(b) The operator in charge shall keep a "book of orders of the station," the pages of which must be numbered. It is forbidden to detach leaves from this book and to use erasers on its pages.

A record will be kept in this book of all orders received from officers with authority to issue them, such as the ship's captain, his substitute, the inspectors representing a Prefect of Ports, etc. Every order will be marked with a number, and in a marginal note the operator will state the date and hour in which it was received; also the place, whenever possible.

The book of orders will be considered as an official document jointly with the "watch book" (*libro de guardia*). The two books will be referred to in case of a lawsuit originated from infringement of the regulations or through other causes.

Whenever required by a competent authority this book shall be submitted for inspection.

Opposite the order (to this effect), in a marginal note, the operator will record the date and hour in which he complied with it.

(c) The operator in charge is responsible for the "service" of the station; therefore, he must see to it that all measures are taken to insure the most efficient service the class of the station calls for—as given in the licence issued by the Director of the Maritime Public Radiotelegraphic Service.

(d) Only the operator in charge is responsible for the accounts or bookkeeping of the station and, unless express orders to the contrary are given, he must prepare the balance-sheets and vouchers thereof.

ART. 10.—The operators in charge of a radiotelegraphic station where an emergency station has been installed according to specifications in the Convention, must verify the perfect running of the emergency station before weighing anchor. The experiments to be carried in this case will be purely local, being limited to the test of the generator, the oscillating circuit and the receiving apparatus.

However, if the operator in charge is in doubt as to the range or satisfactory running of the whole set, he may ask any coast station to listen to his call in order to perform any test he may judge necessary. When acting in this way the operator will use the abbreviations given in the international list.

The test will be carried through in this way: the operator will ask for a certain time (*un cierto tiempo*) the transmission of the signal ● ● ● — ● in order to verify the receiving set; afterwards, the operator will send the same signal using the emergency transmitting apparatus, thus testing its efficiency and the wavelength.

The operator of the station will record in his "watch book" all the remarks suggested by the test and the result of same. If the emergency station is found deficient in some respect, the operator will report to the captain so that he may give the necessary orders to have it repaired and in working order, according to the International Convention.

ART. 11.—When a national merchant ship happens to enter a zone where naval manoeuvres are being performed by men-of-war using their wireless, the merchant ship must ask for a licence from the chief of operations to send her messages to the land stations, and in so doing she must state the approximate time that will be required to transmit the traffic in hand.

In these communications both the man-of-war and the merchant ship will use the prefix "T.R."

ART. 12.—Whenever these Regulations are infringed information about the facts will be gathered, and in view of the evidence fines will be imposed, according to the national and international laws and regulations governing the telegraphic and radiotelegraphic services. The payment of the fines will not prevent further legal action, as may be required by the nature of the fault.

A "license" may be cancelled if the findings in the summary show the convenience of so doing.

SUB-SECTION 10.

OFFICIAL CLASSIFICATION, RATES, COLLECTIONS, AND ACCOUNTS IN ALL KINDS OF RADIOTELEGRAPHIC STATIONS.

ART. 1.—To make up and liquidate the accounts concerning radiograms received from

the public at the coast stations, the following method will be observed:

(a) If there is no postal or telegraph office in the locality, the money corresponding to this service will be paid to the Post and Telegraphs Treasury through the Administrative Section under the Director-General of the Ministry of Marine.

(b) If there is a postal or telegraph office in town, the payments referred to in (a) will be made to it, daily, the wireless coast station getting a receipt for every remittance.

(c) In places where there is a telegraph office, the coast station shall receive messages from the public when the former is out of connection with the telegram system, and the tolls collected will be paid by the latter to the telegraph office, as stated in (b).

ART. 2.—Radiograms from the personnel of the national Navy and ships belonging to other State services will be exempted of the tolls caused at the State ship and coast stations, but not of those corresponding to the land lines.

When such radiograms as those referred to in this article do not use land lines, their transmission will be charged according to the lowest (*simple*) telegraph rates.

ART. 3.—The personnel of the Navy shall be able to make use, without charge, of radiotelegraphy for affairs of service connected with their functions, providing that the interchange is effected directly between stations of the Navy and without the intervention of any other system of communication. This class of radiotelegram shall bear the prefix "R.S.," and will not be forwarded without the sanction of the officer in command. As regards transmission, they will take priority over the "D.P." radios.

ART. 4.—The collection of tolls on private radiograms from ships of the Navy or other public services is subject to the following rules:—

(a) Radiograms from the personnel mentioned in Art. 2 and those addressed to any of the national wireless stations to be forwarded by land lines to men in the service, are subject to the ordinary telegraph rates and the amount in full must be paid to the operator or chief of the station, just as telegraphic messages are paid for in land offices. The operator will issue in every instance a receipt of the amount collected.

(b) Every day the operator in charge will hand over to the ship's purser the money received for private messages sent out, and the purser will give a receipt of the amount.

(c) The pursers of ships stationed between La Plata and the Buenos Aires ports will pay out every month to the Arsenal Administrative Department the money received from the operators in charge. This payment to be made according to paragraph (a), Art. 1, of this Sub-section.

(d) The same operation will take effect every month in the arsenal and ships anchored in the military port, where the Administrative Department will hand over the money received directly to the Telegraph office at that port.

(e) In the case of ships out at sea, the deliveries of money will take place as stated in paragraphs (c) and (d), the payments to be made within twenty-four hours of arrival at their jurisdictional port, if such arrival occurs after the day fixed for settlement of accounts.

ART. 5.—Any claim arisen from differences in the accounts submitted will be presented by the Director-General of National Posts and Telegraphs to the Chief of the Maritime Public Radiotelegraphic Service.

ART. 6.—Ships and service sections with wireless stations belonging to Ministries (other than the Interior and Marine) will settle the radiotelegraphic accounts according to agreements they will enter into with the Director-General of Posts and Telegraphs.

ART. 7.—Shipping companies will settle monthly their accounts with the Administration of Posts and Telegraphs. The settlement will be made according to the statement of account that the latter office will prepare and forward to every shipping company.

ART. 8.—Telegraph and radiotelegraph rates at present in force are those published in the pamphlet "National Postal and Telegraphic Schedule of Charges" 1917 edition, and in the "Official List" of International Radiotelegraphic Stations.

National stations will apply the rates therein given.

ART. 9.—With the amount of tolls collected in the public service by the State's and National Shipping Companies' stations (which amounts are paid to the Administration of Posts and Telegraphs as provided in these Regulations) the following documents will be submitted: the list of radiograms exchanged with the necessary information to identify them, and the original of every message sent, relayed and received.

These originals will be placed in a sealed envelope, to be opened only by the Administration of Posts and Telegraphs.

ART. 10.—One copy of the list (mentioned in Art. 9) shall be sent in the first five days of every month to the Radiotelegraphic Department, Ministry of Marine. Shipping companies' stations shall forward these lists through the office of the Prefect-General of Ports.

ART. 11.—A separate list will be made of the official radiograms exchanged between the Navy units and between these units and the national coast stations, when the last is their final destination. This list will be sent only to the Radiotelegraphic Department, also in the first five days of every month, and must be accompanied by the originals of the radiograms exchanged (received, relayed, and transmitted) as provided by Art. 9.

ART. 12.—Coast and ship tolls will be liquidated between the Director-General of Posts and Telegraphs and the foreign administrations or companies controlling the stations intervening in the exchange of radiograms, according to Art. XIII of International Radiotelegraphic Regulations.

ART. 13.—The tolls collected on account of public service radiotelegrams exchanged direct between ships owned by the same company shall not be paid to the Administration of Posts and Telegraphs, but the corresponding list of messages and their originals shall be supplied as provided above.

ART. 14.—The accounts for direct radiotelegraphic exchange between Argentine merchant ships or between Argentine and foreign ships will be settled between the respective companies, and to this effect in each case the receiving station will make the corresponding charge to the transmitting station, but the list of messages and the

originals of the messages exchanged will be supplied by the stations on board national ships.

ART. 15.—The Director-General of Posts and Telegraphs shall include in the official list of telegraphic offices the data *re* national licensed coast and ship stations existing in the country, and the list will be kept for reference and consultation by the public at every telegraph office in the Republic. The necessary information to prepare this list—as detailed below—will be supplied by the Ministry of Marine to the Director of Posts and Telegraphs, viz.:—

(a) *Inland and Coast Stations.*—Name, geographical position as shown by the territorial sub-division of the country, and longitude and latitude of the place.

Ship Stations.—Name of the vessel, and—if essential—name of the owner or owners.

(b) Call letters. (Every group of call letters must contain three letters and shall be differently arranged for each station.)

(c) Normal range.

(d) Radiotelegraphic system employed and characteristics of the transmitting set.

(e) The several wavelengths employed by the station. The normal wavelength to be underlined.

(f) Class of service rendered by the station (communication with ships, general public correspondence, private correspondence, long-distance public correspondence, special correspondence, exclusively official, etc.).

(g) Service hours of the station.

(h) The time and how the signals are sent out, and the meteorological notices, when the station attends to this kind of service.

(i) Coast and ship rates.

The list will contain, as well, the information communicated to the Berne Bureau relating to radiotelegraphic stations not opened for general public correspondence.

In designing radiotelegraphic stations, the following abbreviations will be made use of:—

PG—Station open to general public correspondence.

PR—Station open to restricted public correspondence.

P—Private station (*Estación de interés privado*).

O—Station open exclusively to official correspondence.

N—Permanent Service Station.

X—Station without fixed hours service.

In cases of homonymy, the name of a ship station will be immediately followed—in the first column of the list—by the corresponding call letters.

ART. 16.—In the counting of words to collect the tolls, the rules given in the regulations annexed to the Petrograd Convention will be followed.

ART. 17.—The originals of public service radiograms and all documents appertaining to same will be safely kept by the Direction-General of Posts and Telegraphs during fifteen months, counting from the month following that in which the originals were received at that office.

ART. 18.—Reimbursements originated by the exchange of radiograms with the State's stations will be settled in accordance with the provisions of the International Telegraphic and Radiotelegraphic Convention.

ART. 19.—In the application of the schedule of charges corresponding to messages issued from or addressed to radiotelegraphic stations established in places where no telegraph office is in existence, such stations will be considered as national telegraph offices and the radiotelegraphic rates will be applied only to messages exchanged with ship stations.

CHAPTER III.

NAVY RADIOTELEGRAPHIC STATIONS SERVICE.

SUB-SECTION I.

STATION'S STAFF—DUTIES AND POWERS.

ART. 1.—The staff in every station will consist of one operator in charge and the number of subordinate trained operators required to keep the watch. The number of these operators will be fixed by the Radiotelegraphic Department.

In case of vacancy or temporary absence from the station of the operator in charge, his place will be filled by the operator of highest category or, between men of the same category, by the senior in the service.

Operators in charge shall depend directly from the signal officers.

ART. 2.—The operator in charge is responsible to the Department or to the signal officers—as the case may be—both for the proper running and upkeep of the station apparatus and for any lack of attention in the performance of the service. The operator in charge, however, may have the responsibility devolved upon the subordinate who was in the watch at the time the breakdown or inattention took place.

ART. 3.—When the station is short-handed, the operator in charge will do watch duty as the subordinate, but the former will be at liberty to choose the hours for his watch.

ART. 4.—The hours of watch corresponding to each operator will be fixed beforehand, considering the class of service to be rendered and the number of men on the staff of the station.

ART. 5.—Ship commanders or managers of other public services have authority to increase temporarily the staff of the stations depending from them, when, on account of manœuvres or other similar service, they consider it essential to insure efficient communications.

ART. 6.—To define justly the responsibility attaching to each operator in connection with breakdowns in the apparatus or omissions in the fulfilment of duties, each operator on taking up his watch will sign in the watch book an entry stating the condition in which he receives the apparatus, the hour of his coming in and all other particulars that may help later on to establish responsibilities. This entry shall be signed also by the operator leaving the work.

ART. 7.—Every time a watch is relieved the operator going out will communicate to his relief all information in his possession concerning the service and useful in the proper performance of the duties.

ART. 8.—When, on account of atmospheric discharges, it is dangerous to keep the apparatus ready to work, the antenna shall be connected to earth, and this fact will be recorded in the watch book stating the hour in which the interruption took effect and that in which connection for work was re-established. During the period of interruption, the operator shall test the atmospheric conditions every thirty minutes, and he will reconnect the antenna immediately the discharges cease.

ART. 9.—The managers of special services and the commanders of ships shall see that the archives of radiotelegrams—official and private—are kept in due order and with all the information required; also the stub-book of receipts. To this effect the signal officer or the officer in charge of the bookkeeping will inspect the station with due frequency.

ART. 10.—The *Dársena Norte* station is the "Service Central Station," and upon its call the other stations shall stop their communications unless the messages are *very urgent*, in which case the transmission shall be carried on to the end. "Very urgent" messages are those asking for assistance and those transmitting orders from H.E. the President of the Republic, the Minister of Marine and the commanders of fleets engaged in manœuvres.

ART. 11.—Time service in force for coast and fixed ship stations is as follows:—

Dársena Norte	Permanent (N)
Rio Santiago	.. ..
Faro Recalada (Recalada Lighthouse)	.. ..
	0900—1100,
	1400—1600,
	2000—2400.

Pontón estacionario de Prácticos (Stationary Pilots' Pomoon)	.. ..
Faro Mogotes (Mogotes Lighthouse)	.. ..
Puerto Militar (Military Port)	.. ..
Comodoro Rivadavia	.. ..
Cabo Virgenes	.. ..
Año Nuevo	.. .. 1800—0600
Rio Grande	.. .. 0600—1800
Ushuaia	.. .. Permanent (N)
La Paz	.. .. 2400—1200
Posadas " "
Formosa " "
Puerto Aguirre " "
San Julian	.. .. Permanent (N)

ART. 12.—Commanders of ships navigating along or towards Argentine coasts will have observed on their "R.T." stations the following hours:—

Ships with three or more radio-telegraph operators.	Permanent service.
Ships with two operators	.. 0700—1100
" " "	.. 1400—1800
" " "	.. 2000—2400
Ships with one operator	.. 0800—1100
" " "	.. 1400—1600
" " "	.. 2100—2300

Whenever a complaint is made, a full explanation as to the reasons of delay or other cause of complaint shall be given, and to this effect a record of the facts will be entered in a special Watch Book. This book will be kept by the operator in charge and viséed by the signal officer. Coast stations may call at any hour the ship they want to communicate with. In case of delay, the coast station will regulate its work so as to pick up the ship station at the first opportunity.

Ship commanders may call at any hour the permanent service stations, but, in normal circumstances, they should arrange their calls to other stations in accordance with the latter's hours of working.

Calls for assistance are to be made at any time they are required.

Stations with intermittent service shall attend an urgent call the moment it is heard, whether or not within their regular service hours.

For the purposes of this Article the hour is four hours later than G.M.T.

SUB-SECTION 2.

GENERAL RULES.

ART. 1.—It is absolutely forbidden to the operators to maintain dialogues by wireless; their conversations will, in every instance, be limited to the subjects strictly essential to render a good service.

ART. 2.—Whenever a radiogram is transmitted with a delay of more than thirty minutes after it was handed in, it shall be endorsed with an explanation of the delay which is to be recorded in the watch book.

ART. 3.—When a station calls repeatedly for another and cannot get an answer in more than five minutes, the fact will be recorded in the watch book and also the object of the call. Other stations within the range of the calling station shall record, as well, the call and the omission to answer it. These records will serve to establish the responsibility for possible delays in the transmission or reception of messages.

ART. 4.—When a station "causes a wait" (*da una espera*) of more than ten minutes, the two stations concerned shall record the fact in their respective watch books, the transmitting station giving the classification of the radiogram it has for transmission, and the receiving station the cause of the "wait."

The transmitting station shall remind every ten minutes the receiving station of its being waiting, and the reminders will continue until the radiogram in hand is transmitted.

ART. 5.—Whenever trouble occurs in the receiving apparatus causing a delay of more than ten minutes, a record of the nature of the trouble will be made in the watch book in order to fix responsibilities. The operator in charge will make a similar record whenever he is unable to answer a call through lack of current in the transmitting set, the burning out of a fuse, or other like accident.

ART. 6.—While two stations are in communication, it is absolutely forbidden to the others to interrupt them by calling out a third station, unless the call is to transmit a "very urgent" radiogram or a "general call" from the flagship. However, even in the cases just mentioned the interruption should be made only at the moment the station that is sending messages completes one of them. When this is accomplished the interrupting station shall give the signal of general interruption and the prefix corresponding to either of the very urgent messages above mentioned, which are to have priority in transmission and reception.

ART. 7.—When a ship moors at a port, Navy yard or dockyard, her wireless plant will be closed after a thorough cleaning of its parts.

ART. 8.—To avoid the damages which are likely to occur in wireless stations of resonant spark, on account of the spark gaps being short circuited, the electrodes shall be thoroughly cleaned once a week.

The officer on duty shall be present at the cleaning and will see that it is made properly and thoroughly. To ascertain that the operation has been carried through without impairing the efficiency of the apparatus, the officer will remove the mica washers and will see whether—without them—the contact between each pair of electrodes is perfectly uniform both in the copper rings and the silver discs.

ART. 9.—Radiograms referring to urgent family matters of men in the Navy service,

and issued from a Navy ship *Dársena Norte* station, may be sent thence to destination by telephone, if the sender so desires. This will not alter the charges provided the expression "T.C. Naval" follows the signature.

ART. 10.—Arsenal and dockyard commanders shall take care that the radiotelegraph operators under their command attend in the most thorough manner to the cleaning and maintenance in good order of wireless apparatus on board ships anchored therein. The same commanders will see to it that the operators practise with reasonable frequency in sending and receiving messages.

ART. 11.—It is the duty of the staff of a ship station anchored in a Navy yard or military zone to serve in the land stations in the neighbourhood. If one of the latter is closed for repairs, the operators shall report for duty at the station on board the ship appointed to replace the temporarily closed station.

When the number of available operators is rather large, the commander of the Navy yard or the military zone will appoint the hours of service corresponding to each operator.

ART. 12.—Complaints referring to misdirected, altered, or delayed radiograms should be forwarded by the sender of the message to the captain of the ship whence it was transmitted.

The complaint must contain the number of the radiogram, the hour of transmission, the receiving station, and the name and address of the addressee.

The ship commander will give the necessary instructions to have the information supplied duly checked and all the papers referring to the case shall be sent to the Secretary-General of the Ministry.

Every complaint must refer to one radiogram only.

SUB-SECTION 3.

SPECIAL BOOK-KEEPING OF THE NAVY STATIONS.

ART. 1.—All coast and ship stations shall forward to the Radiotelegraphic Department, Ministry of Marine, in the first five days of every month, two copies of the sheets showing the monthly traffic of both official and public radiograms.

The same stations shall forward, every quarter, a statement of the supplies spent and a requisition of the supplies wanted.

ART. 2.—As often there are divergencies in the international radiotelegraphic service as to the number of words contained in the radiograms sent and received abroad through stations in national men-of-war, these ships shall forward to the Radiotelegraphic Department, Ministry of Marine, an authenticated copy of every message exchanged between them and foreign stations.

Such copies shall be forwarded immediately after the arrival of ships in home waters, so that the Department will be in advance in a position to answer the Administration of Posts and Telegraphs consultations on this subject.

ART. 3.—In all matters relating to management and book-keeping, independent radiotelegraphic stations shall address direct to the Radiotelegraphic Department.

DECREE NO. 1 OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees

ART. 1.—All restrictions imposed having reference to the use of radiotelegraph installations on merchant vessels are removed.

ART. 2.—Merchant vessels shall not make use of their transmitting apparatus on entering the zone comprised within a radius of five nautical miles of the radiotelegraph stations open to public service, and during such period as they remain in that zone. Nevertheless they shall be able to use their transmitters in case of urgent necessity to make calls for assistance.

ART. 3.—A final period of six months is granted for Argentine merchant vessels to comply with the conditions stipulated by the General Regulations of the Radiotelegraph Service.

ART. 4.—At the General Prefecture of Ports an Office of Radiotelegraph Inspection shall be brought into operation which will see that merchant vessels comply with the stipulations of the International Radiotelegraph Convention of London and the General Regulations as regards the Radiotelegraph Service.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

DECREE NO. 2 OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees:

ART. 1.—Authorises the "División Servicio Radiotelegrafico" to arrange for the Radiotelegraph Works of the Navy to carry out, on board merchant vessels entering the ports, all work that may be required by the radiotelegraph stations of those vessels.

ART. 2.—On the termination of the work the amount incurred as regards wages and materials with an additional charge of 10 per cent. as compensation for the use of machinery and costs of administration shall be liquidated the amount in question to be paid by the captain or shipowner before the vessel leaves the port.

ART. 3.—The sums collected in this manner shall be paid over by the "División Servicio Radiotelegrafico" to the Treasury of the General Administrative Authorities, so that in due course they may be paid to the General Treasury of the Nation and credit granted for the items destined for the radiotelegraph stations of the Navy.

ART. 4.—The Radiotelegraph Inspectorate of the General Prefecture of Ports shall make this Decree known to captains and shipowners.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

ASCENSION ISLAND

(See also Map Section)

THIS isolated island lies, at its nearest point, about 900 miles from the mainland of Africa (Liberia) and 700 miles N.W. of St. Helena. It possesses about 250 inhabitants, with an area of 34 square miles.

CONTROL AND ORGANISATION.

The wireless telegraph station, formerly operated by the Admiralty, has now been completely dismantled.

AUSTRALIAN COMMONWEALTH

(See also Map Section)

Including: New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, the Northern Territory of Australia.

THE area of the continent itself is 2,948,366 English square miles, whilst the inclusion of the island of Tasmania, which possesses an area of 26,215 square miles, brings the gross superficies to a total of 2,974,581 square miles. It has a population of about 5,436,794.

The Government is a Federal Commonwealth Government—the Executive power vested in the Sovereign (acting through the Governor-General) assisted by the Executive Council of seven Ministers of State and such honorary Ministers as may be appointed thereto. The constitution rests on the fundamental law of March 16th, 1898, ratified by the Imperial Parliament of July 9th, 1900, and the Commonwealth was inaugurated January 1st, 1901.

CONTROL AND ORGANISATION.

Originally radiotelegraphy was organised in Australia under the supervision of the Postmaster-General, the Naval Department exercising jurisdiction independently over their own radiotelegraph stations.

By an Order of the Governor-General in Council of June 1st, 1922, the control of wireless services of the Commonwealth was transferred to the Prime Minister's Department with such existing staff as the Prime Minister may require for the economic and efficient working of the service.

ADMINISTRATION.

The Act to Regulate Radiotelegraphy in Australasia was passed in 1905. A number of additions and modifications were introduced by Wireless Telegraphy Acts No. 33 of 1915 and No. 4 of 1919, and this amended text will be found below, it being the extant Governing Decree under which wireless is at present administered.

In 1912 the Commonwealth Parliament passed the Navigation Act, wherein is contained a clause which makes it compulsory for ships trading in Australian waters to be fitted with radiotelegraphic apparatus.

We append the text of current radiotelegraphic legislation in accordance with the following list:—

- A**—Wireless Telegraph Act, 1905 (No. 8), as amended by Act No. 33 of 1915 and Act No. 4 of 1919.
- B**—Wireless Telegraph Regulations, 1920.
- C**—Ships License.
- D**—Receiving License for Amateurs.
- E**—Transmitting and Receiving License for Amateurs.
- F**—Land Station License.
- G**—Navigation Act, 1912 (Sec. 231).
- H**—Navigation (Wireless Telegraphy) Regulations.
- I**—Amendment of Navigation (Wireless Telegraphy) Regulations. (Statutory Rules, 1921, No. 104.)
- J**—Amendment of the Navigation Act, 1912—1920. (Second Amendment, 1921.)

Act No. 8 of 1905.

(As amended by the Wireless Telegraphy Acts, No. 33 of 1915 and No. 4 of 1919.)

A 1. *Short Title.*—This Act may be cited as the Wireless Telegraphy Act, 1905.

2. *Interpretation.*—In this Act—

“Australia” includes the territorial waters of the Commonwealth and any territory of the Commonwealth;

“Wireless Telegraphy” includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

3. *Exemption of Ships of War.*—This Act shall not apply to ships belonging to the King's Navy.

4. *Exclusive Privileges.*—The Minister for the time being administering the Act shall have the exclusive privilege of establishing, erecting, maintaining and using stations and appliances for the purpose of—

(a) transmitting messages by wireless telegraphy within Australia, and receiving messages so transmitted, and

(b) transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and

(c) receiving in Australia messages transmitted by wireless telegraphy from any place or ship outside Australia.

5. *Licenses.*—Licenses to establish, erect, maintain, or use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being administering the Act for such terms and on such conditions and on payment of such fees as are prescribed.

6. *Penalty for Breach of Act.*—(1) Except as authorised by or under this Act, no person shall—

(a) establish, erect, maintain, or use any station or appliance for the purpose of

transmitting or receiving messages by means of wireless telegraphy; or

(b) transmit or receive messages by wireless telegraphy.

Penalty: Five hundred pounds, or imprisonment with or without hard labour for a term not exceeding Five years.

Ships fitted with Apparatus for Wireless Telegraphy.—(2) Sub-section (1) of this section shall not, except as prescribed, extend to appliances maintained on any ship, arriving from any place beyond Australia, for the purpose of enabling messages to be transmitted from or received on that ship by means of wireless telegraphy, but all such appliances shall, while the ship is within Australia—

(a) be subject to the control of the Minister for the time being administering the Act; and

(b) only be used by his authority or as authorised by the regulations.

Penalty: Five hundred pounds.

7. *Forfeiture of Appliances Unlawfully Erected.*—All appliances erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, shall be forfeited to the King for the use of the Commonwealth.

8. *Search Warrants for Appliances Unlawfully Erected.*—(1) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that any appliance is established, erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, he may grant a search warrant to any person.

(2) A search warrant under this section shall authorise the person to whom it is addressed to break and enter any place or ship, where the appliance is or is supposed to be, either by day or by night, and to seize all appliances which

appear to him to be used or intended to be used for transmitting or receiving messages by means of wireless telegraphy.

9. *Proceedings in Respect of Offences.*—(1) Proceedings for any offence against this Act may be instituted in any Court of Summary Jurisdiction, and any person proceeded against under this section may be dealt with summarily or may be committed for trial.

(2) The Court in dealing summarily with any accused person under this section may, if he is found guilty of any offence against this Act, punish him by imprisonment with or without hard labour for any period not exceeding six months, or by a penalty not exceeding Fifty pounds.

10. *Regulations.*—The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters which by this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to this Act.

STATUTORY RULES.

1920. No. 256.

Amended by

S.R. 127/21. S.R. 210/21. S.R. 3/22. S.R. 42/22.
REGULATIONS UNDER THE "WIRELESS TELEGRAPHY ACT 1905-1919."

B

I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Wireless Telegraphy Act 1905-1919, to come into operation forthwith.

Dated this 9th day of December, 1920.

FORSTER,
Governor-General.

By His Excellency's Command,
GEO. H. WISE,
Postmaster-General.

WIRELESS TELEGRAPHY REGULATIONS.

SHORT TITLE.

—The Regulations may be cited as the Wireless Telegraphy Regulations 1920."

DEFINITIONS.

2.—In these Regulations, unless the contrary intention appears—

"Australian ship" means a ship registered in Australia;

"British ship" means a British ship other than an Australian ship;

"Coast station" means a station which is established on land or on board a ship permanently moored, and which is open for the transmission and receipt of messages by means of wireless telegraphy between the land and ships at sea;

"Department" means the Postmaster-General's Department;

"Foreign ship" means a ship other than an Australian ship or a British ship;

"Harbour" includes any harbour properly so called, whether natural or artificial, or any estuary, navigable river, pier, jetty or other work in or at which a ship can obtain shelter, or ship or unship goods or passengers;

"Land station" means a station, not being a coast station established on land for the purpose of communicating by means of wireless telegraphy with the Government-controlled wireless system;

"Licensee" means any person to whom a license has been granted under these Regulations;

"Ship station" means a ship (not permanently moored) having installed thereon appliances for the transmission and receipt of messages by means of wireless telegraphy;

"Station" means a station for the transmission or receipt of messages by means of wireless telegraphy;

"Territorial waters" means the territorial waters of the Commonwealth, and those of any territory of the Commonwealth, and includes harbours;

"The Act" means the "Wireless Telegraphy Act" 1905-1919;

"The Minister" means the Postmaster-General or the Minister for the time being administering the Act;

"The Radiotelegraphic Convention" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention, or Regulations made from time to time.

"The Secretary" means the Secretary, Postmaster-General's Department;

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic and telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

CLASSES OF LICENSES.

3.—(i) Licenses under section 5 of the Act may be (a) ship's licenses; (b) experimental and instructional licenses; or (c) land station licenses. Licenses shall be in accordance with the forms contained in the Schedule.

(ii) A ship's license shall be granted only in respect of a ship station on an Australian ship.

(iii) An experimental and instructional license may be granted to technical schools and similar institutions, and to persons for instructional purposes or scientific investigation of wireless telegraphy or wireless telephony phenomena, subject to the applicant producing satisfactory proof that he is a natural-born British subject resident in Australia and that he is competent to conduct experiments scientifically.

(iv) A land station license may be granted in respect of a privately-owned and operated station for the purpose of communication between the land station and the nearest Government-controlled station, provided there is no telegraph or telephone communication already in existence between those stations.

(v) A license shall be for a period of one year from the date thereof, and may be renewed from time to time.

FEES FOR LICENCES.

4.—(i) The following fees shall be payable for each year or portion of a year during which any license is in force:—

(a) For a ship's license—One pound;

(b) For an experimental and instructional license—Two pounds;

(c) For a land station license—One pound.

(ii) The fees under this regulation shall be paid in advance.

APPLICATIONS FOR LICENSES—HOW MADE.

5. (i) An application for a ship's license shall be in writing, and contain the following particulars:—

(a) The name of the ship in respect of which the license is applied for;

(b) The port in Australia at which the ship is registered;

(c) The system of wireless telegraphy to be used on the ship.

(ii) An application for an experimental and instructional license shall be in writing, and set out the following particulars:—

(a) Name in full, age, residence, previous training and present occupation, nationality, and parents' nationality.

(b) The scientific, technical, practical, or other grounds upon which it is desired to obtain a license;

(c) Complete diagram of connection and description of the apparatus it is intended to use.

(iii) An application for a land station shall be in writing, and contain the following particulars:—

(a) The locality of the station in respect of which the license is applied for.

(b) The name of the owner of the land on which the station is situated, and whether the applicant is owner or lessee.

(c) The system of wireless telegraphy to be used, and a declaration that the applicant is the *bonâ fide* owner of the apparatus.

(iv) Before granting any license the Minister may require the applicant to furnish such additional particulars as he thinks necessary.

PROVISION AS TO SECRECY.

5A. Notwithstanding anything contained in any experimental or instructional license granted prior to the making of this regulation, neither the licensee under an experimental or instructional license nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid by means of the apparatus licensed by such licensee.

CONDITION AS TO SYNTONY, ETC.

6. Before any license is granted, the applicant shall satisfy the Minister that the wireless telegraphy-apparatus or appliances to be worked in pursuance of the license complies with the regulations for the time being in force governing syntony and wavelength.

ISSUE OF LICENSES.

7. (i) Every ship's license and land station license shall be made out in triplicate. Two parts shall be issued to the licensee, and the other retained in the Postmaster-General's Department.

(ii) Before the license is issued to the applicant he shall execute the part of the license to be retained in the Department.

RENEWAL OF A LICENSE.

8. (i) A license may be renewed by writing thereon or attaching thereto a memorandum stating the period for which it is renewed and signed by the Minister or by the Secretary.

(ii) The renewal may be made at any time within one month before or one month after the expiry of the license.

(iii) The memorandum shall be written on each part of the license, but in the case of the licensee's parts it shall be in the form of an official receipt for the renewal fee signed by the Minister or the Secretary, or by any person authorised to receive moneys on behalf of the Postmaster-General's Department. Such receipts shall be attached by the licensee to the parts of the license in his possession.

REVOCATION OF LICENSE.

9. The Minister may, by notice in writing, revoke and determine any license, on the ground of the licensee having failed to comply with any regulation for the time being in force under

the Wireless Telegraphy Act 1905-1919, or on any other ground specified in the license.

TUNED CRYSTALLITE RECEIVERS.

10. All vessels licensed under the Act which are fitted with wireless telegraphy installations and which trade in the territorial waters of the Commonwealth or adjacent islands under the Commonwealth control, shall be equipped with tuned crystallite receivers or receivers of the thermionic valve or electrolytic type. Other receivers suitable for connecting to the detector terminals of the "Marconi" multiple tuner may be utilised when fitted with suitable transformer, and provided that the tuning and sensitivity are of equal efficiency to that obtained from a receiver specially designed for use with crystallite detectors.

POWERS OF INSPECTION.

11. The Minister or any person authorised in writing by the Minister or the Secretary may at all reasonable times enter upon any station on which wireless telegraphy appliances are installed, or are in course of being installed, in pursuance of a license, and may inspect such appliances and the working and user thereof.

COMMUNICATIONS BETWEEN SHIP AND COAST STATIONS.

12. When communications are made by means of wireless telegraphy between a ship (whether British, foreign, or Australian) in territorial waters and a coast station, the rules in force for the working of wireless telegraphy at the coast station shall be observed.

APPLICATION OF THE RADIOTELEGRAPHIC CONVENTION AND REGULATIONS.

13. The provisions of the Radiotelegraphic Convention and the Service Regulations for the time being in force thereunder, so far as such Convention and Regulations are applicable, shall apply to all wireless telegraphy installations available for the transmission or receipt of private messages, whether installed by the Commonwealth or under license, and to all messages handled by such installations, and every licensee shall comply therewith.

APPLIANCES TO BE WORKED SO AS TO AVOID INTERFERENCE WITH OTHER APPLIANCES.

14. (i) The wireless telegraphy appliances on board any ship (whether an Australian ship, a British ship, or a foreign ship) in territorial waters or in any land station shall be worked in such a way as not to interrupt or interfere with—

(a) Naval or Military signalling; or

(b) The transmission of messages between other wireless telegraph stations.

(ii) In this regulation Naval or Military signalling includes signalling or communicating, by means of any system or wireless telegraphy, by the King's Imperial or Dominion Naval or Military Forces.

APPLIANCES NOT TO BE WORKED WHILE SHIP MOORED TO ANY WHARF OR PIER.

15. Except by permission of the Minister, the wireless telegraphy appliances on board any Australian ship, British ship, or foreign ship (other than a ship of war) shall not be worked or used while the ship is moored to any wharf or pier in Australia:

Provided that any ship anchored or moored under quarantine regulations may use wireless apparatus for purposes of communication with a coast station when no alternative method of electrical communication is available.

USE OF APPLIANCES BY FOREIGN SHIPS OF WAR IN HARBOURS.

16. The use of wireless telegraphy appliances on board any foreign ship of war while in any harbour in Australia, shall be subject to such rules (whether prohibitive or regulative) as the Governor-General may think fit to make.

POWERS OF GOVERNOR-GENERAL IN EMERGENCIES.

17. If at any time an emergency has arisen in which it is expedient that the Commonwealth Government should have control over the transmission of all messages by wireless telegraphy, the Governor-General may, by notice in the *Gazette*, prohibit for such period as he thinks necessary the use of wireless telegraphy on board foreign ships in territorial waters.

CONTROL OF COMMUNICATIONS AND APPLIANCES IN EMERGENCIES.

18. (i) In case of emergency, of which the Minister shall be the sole judge, the Naval Board or any officer in command of any ship of war of His Majesty's Navy (whether Imperial or Dominion), or any officer in command of any part in the Defence Force, may—

(a) Take possession of any wireless telegraph appliances installed on any ship in pursuance of a license, and use such appliances for the King's service; or

(b) Place any person in control of any such appliances; or

(c) Direct the licensee or person in charge of such appliances to submit to him all or any messages tendered for transmission or received by means of such appliances; or

(d) Stop or delay or direct the licensee or person in charge of such appliances to stop or delay the transmission or delivery of any such messages or to deliver them to him; or

(e) Direct the licensee or person in charge of such appliances to comply with all such directions as he thinks fit to give with reference to the transmission or receipt of messages by means of such appliances.

(ii) Every licensee and every person in charge any wireless telegraphy appliances installed in pursuance of a license shall comply with this regulation, and all directions issued in pursuance thereof.

(iii) Reasonable compensation shall be payable to the licensee for any damage to the appliances arising in consequence of the exercise of the powers conferred by this regulation.

(iv) The Minister may, notwithstanding anything contained in a license issued to a licensee under these Regulations, by order published in the *Gazette*, prohibit for such time as he directs any licensee from communicating with any station licensed by or belonging to, or in any country which is at war with His Majesty the King or the possessions thereof.

(v) Any order under sub-regulation (iv) of this regulation may prohibit all communications whatever or may prohibit communications to particular stations or under special circumstances.

OPERATORS' PROFICIENCY CERTIFICATES.

19. (i) Every ship station and land station in respect of which a license is issued shall be operated by a person or persons holding a certificate of competency or certificates of competency issued by the Minister after examination, or by the Postmaster-General of the United Kingdom, or by the proper authority in any part of the British Empire.

(ii) As a general rule candidates who desire to obtain the Post Office Certificate enabling them to act as Ship Operators must be natural-born British subjects and the children of a

father who was also a natural-born British subject. No exception will be made to this rule without reference to the Naval and Military Authorities. Foreign nationality of the candidate's mother will not necessarily be a bar to the issue of the certificate; but all cases of candidates whose mothers were of late-enemy origin will be referred to the Defence Department for a report.

(iii) A fee of Ten shillings shall be paid by the candidate on each occasion on which such candidate is examined. A certificate of competency may be issued at a charge of Five shillings to each candidate who satisfactorily passes the prescribed examination, and in the event of a certificate being lost a fee of Ten shillings shall be paid for the first copy of such certificate, One pound for the second copy, and Two pounds for any subsequent copies.

Provided that the Minister may authorise the issue of a duplicate or copy of a certificate without charge where it has been shown that the original certificate has been lost or destroyed in circumstances over which the holder had no control.

In case of failure a candidate shall not be re-examined in any system or under any circumstances until after the lapse of three months.

(iv) If a person to whom a certificate of competency has been issued by the Minister—

(a) Is convicted of a criminal offence; or

(b) Is, on account of incompetence, or for any other reason, considered by the Minister to be unsuitable to continue to hold the certificate,

the Minister may withdraw, cancel, or suspend the certificate.

(v) Certificates of competency and licenses issued by the Naval Board of Administration appointed under the Naval Defence Act, 1910-1918, and in force at the date of the commencement of these Regulations, shall continue in force as if issued in pursuance of these Regulations.

WATCHERS' PROFICIENCY CERTIFICATES.

19A. (i) It shall be necessary for every person acting as a Wireless Telegraphy Watcher, in accordance with the provisions of section 231 of the Navigation Act, 1912-1920, to hold a certificate of proficiency as a watcher issued by the Postmaster-General, or by the Postmaster-General of the United Kingdom, or by the proper authority in any part of the British Empire, certifying that the holder is capable of receiving and understanding the Radiotelegraph Distress Signal and the Safety Signal, and has sufficient knowledge of the apparatus on which he will be required to keep watch, to know, by means of a buzzer or other simple test, that it is in proper condition to receive signals.

(ii) As a general rule candidates who desire to obtain the Post Office Certificate enabling them to act as Ship Watchers must be natural-born British subjects and the children of a father who was also a natural-born British subject. No exception will be made to this rule without reference to the Naval and Military Authorities. Foreign nationality of the candidate's mother will not necessarily be a bar to the issue of the certificate; but all cases of candidates whose mothers were of late-enemy origin will be referred to the Defence Department for a report.

(iii) A certificate of proficiency as a watcher shall not be issued to any person under sixteen years of age.

(iv) A fee of Five shillings shall be paid by the candidate on each occasion on which he is examined.

USE OF WIRELESS TELEGRAPHY FOR MILITARY PURPOSES.

20. These Regulations shall not prevent the use, without license, by the military authorities of wireless telegraphy for military purposes:

Provided that each wireless telegraphy installation (other than a mere temporary installation) to be used shall be authorised in writing by the Minister.

CHARGES.

21. The total charges for messages transmitted and received for any duly authorised station within the Commonwealth or licensed under the Wireless Telegraphy Act 1905-1919 shall include:—

(a) The coast station charge which belongs to the coast station;

(b) The ship station charge which belongs to the ship station;

(c) The charge for transmission over the lines of the telegraph system (where necessary); and

(d) Delivery charges (where necessary).

22. The rates for messages transmitted to or received from ship stations shall be as follows:—

(i) For ordinary messages—

(a) Coast station transmitting or receiving charge—

(i) Radiotelegrams to or from ships licensed in Australia or New Zealand, 3d. per word;

(ii) Radiotelegrams to or from other ships, 6d. per word.

(b) Ship station transmitting or receiving charge—

(i) Radiotelegrams to or from ships licensed in Australia or New Zealand 2d. per word;

(ii) Radiotelegrams to or from other ships, not exceeding 4d. per word.

(c) Land line charge, 1d. per word.

(ii) For press messages—

(a) Coast station transmitting or receiving charge, 1½d. per word.

(b) Ship station transmitting or receiving charge, not exceeding 4d. per word, as determined by the ship authorities concerned;

(c) Land line charge ½d. per word, odd fractions of one penny to be reckoned as one penny.

AMENDMENT OF THE WIRELESS TELEGRAPHY REGULATIONS, 1920.

(Statutory Rules 1920, No. 256.)

S.R. 21/210.

Regulation 22 is amended by inserting the following sub-regulation after sub-regulation (ii):

(2A) For Government messages to and from ships—

(a) Coast station charge, 1d. per word.

(b) Ship station charge, half ordinary rates.

(c) Land-line charge, 1d. per word.

(iii) For messages to or from ships of the British or Australian Navies—

(a) For official messages—

(i) Coast station charge, 1d. per word.

(ii) There shall be no ship station charge.

(iii) Land-line charge, 1d. per word.

(b) For private messages—The rates and conditions shown in paragraph (i) of this regulation shall apply.

(iv) For messages consisting of reports to Lloyd's agents concerning marine casualties and overdue vessels:—

(a) Coast station charge, 6d. per word.

(b) Land-line charge, 1d. per word.

The charges for these messages shall be collected from the addressee.

(v) The charge for relaying radiotelegrams, irrespective of the number of coast stations concerned in the relaying, shall be:—

(a) When the ships of origin and of destination are both licensed in Australia or New Zealand, 4d. per word.

(b) When only one of the ships concerned or when neither of the ships concerned is licensed in Australia or New Zealand, 7d. per word.

23. (i) The rates for messages exchanged between stations established on the Australian mainland or in Tasmania and stations established on islands within the Commonwealth administration or between any stations established on such islands except Flinders Island and King Island shall be—

(a) For ordinary messages, 6d. per word.

(b) For press messages—

Not exceeding 50 words 2 6

Every additional 50 words or portion thereof 2 6

(ii) The rates for messages exchanged between stations established on the Australian mainland or in Tasmania and stations established on King and Flinders islands shall be—

(a) For ordinary messages, 2s. 8d. for 16 words or portion thereof, and 2d. for each additional word.

(b) For traffic exchanged between ships and the mainland *via* King or Flinders islands, 1d. per word in addition to the charges prescribed in regulation 22 (i).

(c) For press messages—

Not exceeding 50 words s. d.

Every additional 50 words or portion thereof 2 6

(iii) The rates for messages exchanged between stations established on the Australian mainland or in Tasmania shall be—2s. 8d. for 16 words or portion thereof, and 2d. for each additional word.

(iv) The rates for the radiotelegraphic transmission of deferred and week-end telegrams shall be one-half and one-quarter of the ordinary rates respectively.

(v) Delivery charges, if any, shall in all cases be paid by the addressee.

24. The total charge for messages transmitted to or from ships or land stations shall be paid by the sender.

PRESS RADIOTELEGRAMS FOR PUBLICATION ON SHIPS.

25. (i) Press radiotelegrams for publication on ships shall be addressed to the commander of a ship, or to a newspaper published on board a ship, and shall bear in the address the words "for publication," which words shall be charged for at press rates.

(ii) The information contained in such press radiotelegrams shall either be published in a ship's newspaper or posted on a ship's public notice board.

(iii) Press radiotelegrams shall, subject to this regulation, comply with the provisions of Articles 65 and 66 of the detailed regulations attached to the International Telegraph Convention.

TRANS-OCEANIC PRESS RADIOTELEGRAMS.

25A. Trans-Oceanic press radiotelegrams bearing no address, shall be accepted for broadcast transmission. The charges shall be—

(a) Coast station charge, 1d. per word.

(b) Land-line charge, 1d. per word.

REFUNDS.

26. The full charge for a radiotelegram will be refunded when such radiotelegram is

rendered useless through a fault of the telegraph service, and the full charge, less land-line charges will be refunded when a radiotelegram cannot be delivered on account of the ship of destination having passed out of range.

TRANSMISSION OF SHIPPING INTELLIGENCE BY TELEPHONE.

27. Information received at a coast station from vessels at sea, indicating the noon or midnight position, will be communicated by telephone to the owners or agents of such vessels on payment of One shilling per communication.

OCEAN FORECASTS AND WEATHER REPORTS.

28. Ocean forecasts sent by the Commonwealth Meteorologist will be transmitted from radiotelegraph stations owned, operated, and maintained by or on behalf of the Minister to vessels at sea, and weather reports received at such radiotelegraph stations from vessels at sea, and addressed to the Commonwealth Meteorologist, will be transmitted, on payment of the following charges:—

For each communication not exceeding 20 words, 2s.; for each additional word, 1d.; plus one penny per word land-line charge.

REPEAL.

29. All regulations previously made under the Wireless Telegraphy Act 1905-1919, and in force at the commencement of these Regulations, are hereby repealed save as to any right, privilege, or obligation acquired, accrued, or incurred thereunder.

THE SCHEDULE.

COMMONWEALTH OF AUSTRALIA.

Ship's License.

Dated 19

C To all to whom these presents shall come, I, the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919,
SEND GREETING:

Whereas
of in the State of (hereinafter called "the licensee") is desirous of establishing, erecting, maintaining and using on the called belonging to the licensee appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy:

And whereas by reason of the provisions of the Telegraph Acts 1863 to 1907 of the United Kingdom and the Wireless Telegraphy Order 1903 of the United Kingdom it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a license granted in that behalf by the Postmaster-General of that Kingdom:

Provided that a person on board a British ship which is registered in any British Possession (other than the Channel Islands and the Isle of Man) or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act 1904 of the United Kingdom by reason of the installation and working of wireless telegraphy on such ship if the authority in such Possession or Protectorate having power by law so to do shall have granted a license for the installation and working of apparatus for wireless telegraphy on that ship and if such person is acting in accordance with the provisions of such license:

And whereas the ship in respect of which this license is granted is registered in the Commonwealth:

And whereas by the Wireless Telegraphy Act 1905-1919 of the Commonwealth of Australia it is enacted that licenses to establish, erect, maintain and use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being administering the Act, for such terms and on such conditions and on payment of such fees as are prescribed:

And whereas the licensee has made application for this license and has paid the prescribed fee payable in respect thereof:

Now I,

the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, aforesaid, in pursuance of the Wireless Telegraphy Act 1905-1919, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee during the term or period commencing on the day of 19, and terminating on the day of 19, license and permission—

(i) To establish, erect, and instal and maintain, work, and use for the purposes hereinafter mentioned at the ship station specified in the First Schedule hereto, appliances or apparatus for wireless telegraphy of the kind used in the system known as the system of wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus").
Provided that—

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention 1912 as is specified in the said schedule opposite to the name of such station;

(b) The apparatus installed shall be of the character specified in the said First Schedule;

(c) A complete scheme of the connections intended to be employed shall be supplied by the licensee;

(d) The transmitting apparatus used on the ship station shall be of such a character that the waves emitted are as pure and little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals.

(e) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 300 metres in length as measured by the standard of measurement in use by the Post Office in the United Kingdom for the time being and may have such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Minister;

(f) The speed of transmission and reception of messages shall not in normal circumstances be less than twenty words a minute, five letters being counted as one word.

(ii) To transmit and receive messages by means of the licensed apparatus between the said ship station and coast stations and other ship stations. Provided that the transmission and receipt of messages from and at the said ship station when in any harbour in the British

Islands shall be subject to such conditions and restrictions as the Postmaster-General of the United Kingdom may prescribe from time to time, and when in any harbour in the Commonwealth or any Territory under the control of the Commonwealth shall be subject to the Regulations under the Wireless Telegraphy Act 1905-1919; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus, or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the First Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905-1919.

The term "telegraph" has the same meaning as in the Telegraph Act 1869 of the United Kingdom.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station, and any other wireless telegraph station, whether a coast station or a ship station.

The expression "His Majesty's Navy" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraphic Convention 1912" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person, either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Stations using wavelengths longer than those set apart for naval purposes shall not emit any subsidiary waves or harmonics likely to interfere with signalling or the commercial wavelengths or naval wavelengths in the vicinity.

(3) If the Minister is of opinion that the working of the licensed apparatus specified in the First Schedule hereto is inconsistent with the free use of naval signalling, the licensee shall when required in writing by the Minister so to do, close the said station.

(4) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license, the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the Wireless Telegraphy Act 1905-1919 so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

9. The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraphic Convention 1912.

10. The licensee shall at all times indemnify the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

11. (1) Subject to the provisions of this license, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of the Commonwealth the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

12. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

13. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates of competency issued by the Minister or by the Postmaster-General of the United Kingdom. Certificates of competency shall be granted only to persons who satisfy the Minister that they possess the requisite technical proficiency as regards operating and knowledge of the regulations governing signalling, and shall be in such form and subject to such conditions as the Minister shall from time to time prescribe.

14. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or the Government of the Commonwealth or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee by means of the apparatus hereby licensed.

15. The licensee shall keep full accounts records, and registers of all messages transmitted by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the head office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a Statute or general holiday.

16. The Minister or any agent authorised in that behalf in writing by him may at all reasonable times enter upon the ship station hereby licensed for the purpose of inspecting, and may inspect any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and use of such apparatus and telegraphic instruments.

17. The licensee shall cause to be carried on the ship to which the license relates a print or copy of the license certified under the hand of an appropriate officer of the Minister to be a true copy, and also such documents as may be prescribed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention 1912.

18. (1) The licensee shall pay to the Minister for and in respect of the license hereby granted a fee of One pound per annum.

(2) The fee payable under this license shall be payable before the issue of the license, and the fee payable upon the renewal of the license shall be payable before such renewal.

19. Except with the consent in writing of the Minister, the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the license powers or authorities hereby granted.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall

have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer in command of any ship of war of His Majesty's Navy to cause the licensed apparatus, or any part thereof, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer may seem fit, and in that event any person authorised by the said officer may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly, and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly, or the said officer may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. In any of the following cases (that is to say) :—

(a) In case of any sum of money which ought to be paid by the licensee to the Minister, under or by virtue of these presents, shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the covenant herein contained ;

(b) In case of any breach, non-observance, or non-performance by or on the part of the licensee of any or the covenants (other than a covenant for the payment of money) or conditions herein contained, and on the part of the licensee to be observed and performed ; or

(c) In case the licensee fails to comply with any regulation for the time being in force under the Wireless Telegraphy Act 1905-1919 ;

then and in any such case the Minister may by notice in writing revoke and determine these presents, and the license, powers, and authorities hereinbefore granted, and thereupon these presents and the said license, powers, and authorities shall absolutely cease, determine, and become void but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Minister under the covenants on the part of the licensee herein contained.

22. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time to establish, extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit ; neither shall anything herein contained prejudice or affect the right of the Minister from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether

of a like nature to those hereby licensed or otherwise) or to the transmission of messages in any part of the Commonwealth or any Territory under the control of the Commonwealth by means of wireless telegraphy, or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister by or under the Post and Telegraph Act 1901-1916 or the Wireless Telegraphy Act 1905-1919.

23. Any notice, request, or consent (whether expressed to be in writing or not) to be given by the Minister under these presents may be under the hand of the Minister or any officer authorised by him to act on his behalf, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary at his official address within the Commonwealth.

SCHEDULE I.

PARTICULARS OF THE SHIP STATION REFERRED TO IN THIS LICENSE.

Name of ship on which station is established.	Class of ship under Radiotelegraphic Convention.	Nature of services performed.	Hours of service.	Normal Range of signalling in nautical miles.		Character of apparatus		Power.	
				By night.	By day.	System of Radiotelegraphy and characteristics of the system of emission.	Wavelength in metres.	Source and maximum output. Maximum to be taken by transmitting instruments.	If alternator is used. Number of cycles per second.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Other particulars :—

SCHEDULE II.

COMPLETE SCHEME OF CONNECTIONS AUTHORIZED TO BE EMPLOYED IN THE HEREBIN LICENSED STATION.

This drawing, which is purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed, and delivered by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, in the presence of (L.S.)

Signed, sealed, and delivered by the Licensee in the presence of (L.S.)

COMMONWEALTH OF AUSTRALIA.

EXPERIMENTAL AND INSTRUCTIONAL LICENSE.

D RECEIVING LICENSE FOR AMATEURS.

Dated No. 19

To all to whom these presents shall come, I the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 send greeting.

Whereas

of in the State of (hereinafter called "the licensee") is desirous of establishing, erecting, maintaining, and using a system of wireless telegraphy or telephony as defined in section 2 of the Wireless Telegraphy Act 1905-1919 with the sole object of conducting demonstrations or experiments in wireless telegraphy or telephony.

And whereas by reason of the provisions of the Post and Telegraph Act 1901-1916, and of the Wireless Telegraphy Act 1905-1919, it is unlawful to establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy or telephony except under and in accordance with a license granted in that behalf by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, and it is also unlawful, save as in the said Acts provided, to transmit telegrams or other communications by telegraph within the Commonwealth of Australia :

And whereas the licensee has made application for this license ;

Now I, the Minister or Member of the Executive Council for the time being administering the Wireless

Telegraphy Act 1905-1919 aforesaid, in pursuance of the Wireless Telegraphy Act 1905-1919 and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee from the date of these presents until these presents are determined as hereinafter provided license and permission—

(i) To establish, erect, maintain, and use at the station specified in the first and second schedules hereto, appliances for the purpose only of receiving messages by means of wireless telegraphy or telephony (hereinafter called "the licensed appliances") provided that the appliances installed at the station shall be of the character specified in the said first and second schedules; and

(ii) To receive messages by means of wireless telegraphy or telephony at the said station from any experimental station provisionally authorised or fully licensed by the Minister: Provided that the licensed appliances shall be worked and the messages shall be received solely for the purpose of conducting experiments in wireless telegraphy or telephony, and for no other purpose whatever.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the schedules hereto) the following words and expressions shall have the several meanings hereinbefore assigned to them unless there be something, either in the subject or context, repugnant to such construction (that is to say):—

(1) The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905-1919.

(2) The terms "telegraph" and "telegraph line" have the same meanings as in the Post and Telegraph Act 1901-1916.

(3) The expression "naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station, and any other wireless telegraph or telephone station, whether on shore or in any ship.

(4) The expression "His Majesty's Navy" or "His Majesty's ships" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

(5) The expression "Australia" includes the territorial waters of the Commonwealth of Australia and of any territory of the Commonwealth of Australia.

(6) The expression "military, signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia or between one such set of appliances and any other wireless telegraph or telephone station.

(7) The expression "Minister" means the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919.

2. The licensed appliances shall not be used by the licensee or any other person either on behalf or by permission of the licensee for the receipt of messages except messages authorised by this license.

3. The licensee shall observe the provisions of any regulations from time to time made under the Wireless Telegraphy Act 1905-1919 so far as the same are applicable to the licensee.

4. (a) The licensed appliances shall not without the previous consent in writing of the Minister be altered in respect of any of the particulars mentioned in the first and second schedules hereto.

(b) The licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

5. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid by means of the apparatus hereby licensed.

6. The licensee shall not deliver or cause to be delivered to any person any messages received by him by wireless telegraphy or telephony unless the transmission or delivery of such message has been approved by the Minister or by an officer duly authorised by him to approve thereof.

7. The Minister or any person authorised in writing by the Minister or the Secretary may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee for the purpose of inspecting and may inspect any appliances fixed or being in such places respectively for the purpose of receiving messages by wireless telegraphy or telephony and all other telegraphic or telephonic instruments and appliances fixed or being in such stations respectively and the working and the user of such appliances and telegraphic or telephonic instruments respectively.

8. (a) All appliances used or intended to be used under this license shall be so established, erected, maintained, and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraph line of the Postmaster-General which may from time to time exist or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or use thereof.

(b) In case any telegraph line of the Postmaster-General shall be damaged or the efficient working or use thereof shall be wholly or partially interrupted or otherwise interfered with and the Chief Electrical Engineer for the time being of the Postmaster-General's Department shall certify in writing under his hand that such damage interruption or interference has been caused directly or indirectly by any appliances used under this license, or by anything done by or on behalf or with the permission of the licensee in relation thereto, the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraph lines so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraph line if the said Chief Electrical Engineer shall certify that such addition or substitution is reasonably required.

(c) For the purpose of this Article, the expression "telegraph line" has the same meaning as in the Post and Telegraph Act 1901-1916 and the expression "telegraph line of the Postmaster-General" includes a telegraph or telephone line

belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Commonwealth of Australia or other body or person.

9. The licenses powers and authorities hereby granted shall not except with the previous consent in writing of the Minister be assigned transferred sub-let or otherwise disposed of or dealt with and the licensee shall not except with a like consent allow any other person or body to participate in any manner whatsoever in the benefits of such licenses powers or authorities.

10. (a) If and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient that His Majesty the King shall have control over the station or premises specified in the first and second schedules hereto and the appliances and instruments thereon it shall be lawful for the Minister to call upon the licensee to hand over to him on behalf of His Majesty the King such station premises appliances and instruments or any part or parts thereof and if the licensee shall comply with such demand the Minister or any person thereunto authorised by him may enter upon such station or premises and take possession of and use the same together with all appliances and instruments thereon.

(b) The Minister shall during the period the possession and use of the said station premises appliances and instruments are retained on behalf of His Majesty the King reimburse to the licensee all wages and salaries paid by the licensee to persons employed in connection with the said station or premises provided that the employment of such persons is necessary for the proper upkeep of the said station or premises and provided further that such wages or salaries are at the same rates as previously paid by the licensee for similar services.

(c) In the event of the licensee refusing to hand over on demand the said station or premises and the appliances and instruments thereon the Minister may immediately thereupon cancel this license without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of such station premises appliances or instruments.

11. The technical details of the herein licensed station are contained in the first schedule hereto, and the complete scheme of connections authorised to be employed is shown in the second schedule hereto.

12. (a) The licensee shall pay to the Minister for and in respect of license hereby granted a fee of Two pounds (£2) for each year or part of a year the license is in force in respect of the station at which the licensed apparatus is installed.

(b) The fee shall be payable to the Minister annually in advance.

13. The Minister may at any time in his absolute discretion give notice in writing to revoke and determine these presents and to

cancel the license or permission hereby given at the end of twenty-four hours from the time of service of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Minister under any covenant or provision herein contained on the part of the licensee to be observed and performed.

14. In the event of these presents and the license or permission hereby given being revoked and determined by the Minister under the power hereinbefore contained or any other power hereunto enabling him the licensee shall not be entitled to any compensation or damages by reason of the determination.

15. Nothing in these presents contained shall prejudice or affect the right of the Commonwealth of Australia from time to time to establish erect extend maintain and use any system or systems of telegraphic or telephonic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as it shall in its discretion think fit neither shall anything herein contained prejudice or affect the right of the Commonwealth of Australia from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs or telephones (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of Australia by means of wireless telegraphy or telephony or by any other means with or to any person or persons whomsoever upon such terms as it shall in its discretion think fit and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Post and Telegraph Act 1901-1916 or by the Minister under the Wireless Telegraphy Act 1905-1919.

16. Any notice request or consent (whether expressed to be in writing or not) to be given by or for the Minister under these presents may be under the hand of the Secretary for the time being to the Department being administered by the Minister and may be served by sending the same by registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee and in such case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at such place and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to such Secretary at his official address within the Commonwealth.

In witness whereof the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 has hereunto set his hand and seal the day and year first hereinbefore written.

SCHEDULE I.

Names of Station.	Description of Receiving Apparatus.
(1)	(2)

SCHEDULE II.

Complete scheme of connections authorised to be employed in the herein licensed station.

This drawing, purely diagrammatic, shows the circuits authorised to be employed in the receiver.

Signed, sealed, and delivered by the
Minister or Member of the Executive
Council for the time being admin-
istering the Wireless Tele-
graphy Act 1905-1919 in the
presence of—

This license is accepted by me under the provisions and terms and on the conditions above set out.

Signed, sealed, and delivered by the
said licensee in the presence of—

COMMONWEALTH OF AUSTRALIA.

EXPERIMENTAL AND INSTRUCTIONAL
LICENSE. TRANSMITTING AND RE-
CEIVING LICENSE FOR AMATEURS.

No. 19
Dated

To all to whom these presents shall come, I, the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 send greeting:

Whereas
of
in the State of
(hereinafter called "the licensee"), is desirous of establishing, erecting, maintaining, and using a system of wireless telegraphy or telephony as defined in section 2 of the Wireless Telegraphy Act 1905-1919, with the sole object of conducting demonstrations or experiments in wireless telegraphy or telephony: And whereas by reason of the provisions of the Post and Telegraph Act 1901-1916 and of the Wireless Telegraphy Act 1905-1919 it is unlawful to establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy or telephony except under and in accordance with a license granted in that behalf by the Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, and it is also unlawful, save as in the said Acts provided, to transmit telegrams or other communications by telegraph within the Commonwealth of Australia:

And whereas the licensee has made application for this license:

Now I, the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 aforesaid, in pursuance of the Wireless Telegraphy Act 1905-1919, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee from the date of these presents until these presents are determined as herein after provided, license and permission—

(i) To establish, erect, maintain, and use at the station specified in the first and second schedules hereto appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy or telephony (hereinafter called "the licensed appliances"), provided that the appliances installed at the station shall be of the character specified in the said first and second schedules, and operated in accordance with the conditions specified.

Provided that the licensed appliances shall be worked and the messages shall be transmitted and received solely for the purpose of conducting demonstrations in wireless telegraphy or telephony at public lectures or conducting experiments in wireless telegraphy or telephony for the advancement of science and for no other purpose whatever.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions, which may be altered, added to, or modified hereafter to meet public interests or requirements or emergencies.

1. In these presents (and in the schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction (that is to say):—

(1) The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905-1919.

(2) The terms "telegraph" and "telegraph line" have the same meaning as in the Post and Telegraph Act 1901-1916.

(3) The expression "naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph or telephone station, whether on shore or on any ship.

(4) The expression "His Majesty's Navy" or "His Majesty's ships" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

(5) The expression "Australia" includes the territorial waters of the Commonwealth of Australia and of any territory of the Commonwealth of Australia.

(6) The expression "military signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia, or between one such set of appliances and any other wireless telegraph or telephone station.

(7) The expression "Minister" means the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919.

2. The licensed appliances shall not be used by the licensee or any other person either on behalf or by permission of the licensee for the transmission or receipt of messages except messages authorised by this license.

3. The licensee shall observe the provisions of any regulations from time to time made under the Wireless Telegraphy Act 1905-1919 so far as the same are applicable to the licensee.

4. (a) The licensed appliances shall be so worked as not to interfere with the working of any wireless telegraph or telephone station established in Australia by or for the purposes of the Minister or any Department of the Commonwealth of Australia, or for commercial purposes, and in particular with the transmission or receipt of any messages between or at wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea. On no account shall His Majesty's ships be called by means of the licensed appliances.

(b) With a view to preventing such interference as aforesaid the licensee and every person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Minister or prescribed by the Minister with respect to avoiding interference between one wireless telegraph or telephone station and another.

(c) The licensed appliances shall not without permission, in writing, from the Minister, or an officer thereunto authorised by him, be altered in respect of any of the particulars mentioned in the first and second schedules hereto.

(d) The licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

5. (a) The licensee shall not (either by himself or by any person acting on his behalf or by his permission), by the transmission of any message by means of the licensed appliances or otherwise by the use of the licensed appliances, interfere with naval or military signalling.

(b) Whenever the operators of the said station of the licensee perceive, through the medium of the appliances used by them, that naval or military signalling is proceeding, they shall refrain from using the licensed appliances until all indication that naval or military signalling is proceeding shall have ceased.

(c) These provisions for the protection of naval or military signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid, by means of the apparatus hereby licensed.

7. The Minister or any person authorised in writing by the Minister or the Secretary, may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee, for the purpose of inspecting, and may inspect any appliances fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy or telephony and all other telegraphic or telephonic instruments and appliances fixed or being in such stations respectively and the working and the user of such appliances and telegraphic or telephonic instruments respectively.

8. (a) All appliances used or intended to be used under the license shall be so established, erected, maintained, and used as not either directly, or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working, or user of any telegraph line of the Postmaster-General which may from time to time exist, or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or use thereof.

(b) In case any telegraph line of the Postmaster-General shall be damaged or the efficient working or use thereof shall be wholly or partially interrupted or otherwise interfered with, and the Chief Electrical Engineer for the time being of the Postmaster-General's Department shall certify in writing under his hand that such damage, interruption, or interference has been caused directly or indirectly by any appliances

used under this license, or by anything done by or on behalf or with the permission of the licensee in relation thereto, the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraph lines so as to restore the same to efficient working order, and in adding thereto or substituting therefor either temporarily or permanently any other telegraph line, if the said Chief Electrical Engineer shall certify that such addition or substitution is reasonably required.

(c) For the purpose of this Article, the expression "telegraph line" has the same meaning as in the Post and Telegraph Act 1901-1916, and the expression "telegraph line of the Postmaster-General" includes a telegraph or telephone line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Commonwealth of Australia or other body or person.

9. Except with the consent in writing of the Minister the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefits of the licenses, powers, or authorities hereby granted or any of such licenses, powers, or authorities.

10. (a) If and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient that His Majesty the King shall have control over the transmission and receipt of messages by the licensed appliances, it shall be lawful for the Minister to call upon the licensee to hand over to him on behalf of His Majesty the King so much of the licensed appliances as is within Australia, or any part thereof, and if the said licensee shall comply with the demand the Minister or any person authorised by him may enter upon and take possession of the station specified in the first and second schedules and use the same together with all appliances and instruments thereon.

(b) The Minister shall, during the period the possession and use of the said station, appliances, and instruments are retained on behalf of His Majesty the King, reimburse to the licensee all wages and salaries paid by the licensee to persons employed in connection with the said station, provided that the employment of such persons is necessary for the proper upkeep of the said station, and provided further that such wages or salaries are at the same rates as previously paid by the licensee for similar services.

(c) In the event of the licensee refusing to hand over the said station and appliances on demand, the Minister may immediately thereupon cancel this license without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of the said station and appliances.

11. The technical details of the herein licensed station are contained in the first schedule hereto; and the complete scheme of connections authorised to be employed is shown in the second schedule hereto.

12. (1) The licensee shall pay to the Minister for and in respect of the license hereby granted a fee of Two pounds (£2) for each year or part of a year the license is in force in respect of the station at which the licensed apparatus is installed.

(2) The fee shall be payable to the Minister annually in advance.

13. The Minister may at any time in his absolute discretion by notice in writing revoke and determine these presents and cancel the license or permission hereby given at the end of twenty-four hours from the time of service of such notice, and at the expiration of that period the

license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any covenant or provision herein contained on the part of the licensee to be observed and performed.

14. In the event of these presents and the license or permission hereby given being revoked and determined by the Minister under the power hereinbefore contained or any other power thereunto enabling him, the licensee shall not be entitled to any compensation or damages by reason of the determination.

15. Nothing in these presents contained shall prejudice or affect the right of the Commonwealth of Australia from time to time to establish, erect, extend, maintain, and use any system or systems of telegraphic or telephonic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as it shall in its discretion think fit, neither shall anything herein contained prejudice or affect the right of the Commonwealth of Australia from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs or telephones (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of Australia by means of wireless telegraphy or telephony or by any other means with or to any person or persons whomsoever, upon such terms as it shall in its discretion think fit, and (save as in this license expressly provided) nothing herein con-

tained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Post and Telegraph Act 1901-1916 or by the Minister by or under the Wireless Telegraphy Act 1905-1919.

16. Any notice, request, or consent (whether expressed to be in writing or not) to be given or made by or for the Minister under these presents may be under the hand of the Secretary for the time being of the Department being administered by the Minister, and may be served by sending the same by registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and in such case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at such place; and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to such Secretary at his official address within the Commonwealth of Australia.

17. The licensee may communicate with any experimental radiotelegraph station provisionally authorised or fully licensed by the Minister for experimental purposes, providing that such communication does not interfere with the conduct of W/T signalling.

In witness whereof the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 has hereunto set his hand and seal the day and year first hereinbefore written.

SCHEDULE I.

CHARACTER OF APPLIANCES.

Name of Licensee and Address of Station.	Description of Transmitting Appliances.	Description of Receiving Appliances.	Wavelength to be employed in Transmitter.	Maximum Watt energy permitted to be employed in Transmitter.
1.	2.	3.	4.	5.
Type of aerial, height, construction				
Nature and voltage of primary power ..				
Transformer; ratio of windings				
Spark gap				
Particulars of transmitting oscillator				
Condenser—Capacity of				
Form of coupling				
Details of earth connections				

SCHEDULE II.

Complete scheme of connections and aerial system authorised to be employed in the herein licensed station.

This drawing, purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed, and delivered by the
Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 in the presence of—

This license is accepted by me under the provisions and terms and on the conditions above set out.

Signed, sealed, and delivered by the
said licensee in the presence of—

COMMONWEALTH OF AUSTRALIA.
LAND STATION LICENSE.

Dated 19

To all whom these Presents shall come, I, the Honourable

the Minister, or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 send greeting:

Whereas in the State of

(hereinafter called "the licensee") is desirous of establishing, erecting, maintaining, and using at belonging to the licensee appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy:

And Whereas by the Wireless Telegraphy Act 1905-1919 of the Commonwealth of Australia it is enacted that licenses to establish, erect, maintain, and use stations and appliances for the purpose of transmitting or receiving, messages by means of wireless telegraphy may be granted by the Minister or Member of the Executive Council for the time being administering the Act, for such terms and on such conditions and on payment of such fees as are prescribed:

And Whereas the licensee has made application for this license and has paid the prescribed fee payable in respect thereof:

Now I, the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 aforesaid, in pursuance of the Wireless Telegraphy Act 1905-1919, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee during the term or period commencing on the day of 19, and terminating on the day of 19, license and permission—

(i) To establish, erect, and instal and maintain, work, and use for the purpose hereinafter mentioned at the land station specified in the First Schedule hereto, appliances or apparatus for wireless telegraphy of the kind used in the system known as the system of wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus").

Provided that—

(a) The apparatus installed shall be of the character specified in the said First Schedule;

(b) A complete scheme of the connections intended to be employed shall be supplied by the licensee;

(c) The transmitting apparatus used on the land station shall be of such a character that the waves emitted are as pure and little damped as possible and the receiving apparatus used at the said station or stations shall

be of such a character as to afford the greatest possible protection from disturbance during the reception of signals.

(d) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 300 metres in length as measured by the standard of measurement in use by the Post Office in the United Kingdom for the time being and may have such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Minister.

(e) The speed of transmission and reception of messages shall not in normal circumstances be less than twenty words a minute, five letters being counted as one word.

(ii) To transmit and receive messages by means of the licensed apparatus between the said land station and coast stations. Provided that the transmission and receipt of messages from and at the said land station shall be subject to the Regulations under the Wireless Telegraphy Act 1905-1919; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus, or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the First Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject of context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905-1919.

The term "telegraph" has the same meaning as in the Telegraph Act 1869 of the United Kingdom.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station, whether a coast station or a ship station.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder; and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraphic Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The expression "land station" means a station, not being a coast station, established on land for the purpose of communicating by means of wireless telegraphy with the Government controlled wireless system.

The expression "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person, either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by this license.

3. (i) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(ii) Stations using wavelengths longer than those set apart for naval purposes shall not emit any subsidiary waves or harmonics likely to interfere with signalling or the commercial wavelengths or naval wavelengths in the vicinity.

(iii) If the Minister is of opinion that the working of the licensed apparatus specified in the First Schedule hereto is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister so to do, close the station.

(iv) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license, the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the Wireless Telegraphy Act 1905-1919, so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

9. The licensee shall at all times indemnify the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this license, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise: Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of the Commonwealth the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and re-transmit them with the least possible delay to the proper authorities by means of the licensed

apparatus or any other means in the power of the licensee.

12. The licensed apparatus of the said land station shall be worked only by a person or persons holding a certificate or certificates of competency issued by the Minister or by the Postmaster-General of the United Kingdom. Certificates of competency shall be granted only to persons who satisfy the Minister that they possess the requisite technical proficiency as regards operating and knowledge of the regulations governing signalling, and shall be in such form and subject to such conditions as the Minister shall from time to time prescribe.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or the Government of the Commonwealth or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee by means of the apparatus hereby licensed.

14. The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the Head Office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a Statute or general holiday.

15. The Minister or any person authorised in writing by the Minister or the Secretary may at all reasonable times enter upon the land station hereby licensed for the purpose of inspecting, and may inspect any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and use of such apparatus and telegraphic instruments.

16. The licensee shall exhibit on the land station established under this license a print or copy of the license certified under the hand of an appropriate officer of the Minister to be a true copy, and also such documents as may be prescribed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention 1912.

17. (1) The licensee shall pay to the Minister for an in respect of the license hereby granted a fee of One pound per annum.

(2) The fee payable under this license shall be payable before the issue of the license, and the fee payable upon the renewal of the license shall be payable before such renewal.

18. Except with the consent in writing of the Minister the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the license, powers or authorities hereby granted.

19. (a) If and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient that His Majesty the King shall have control over the transmission and receipt of messages by the licensed appliances, it shall be lawful for the Minister to call upon the licensee to hand over to him on behalf of His Majesty the King the licensed appliances, or any part thereof, and if the said licensee shall comply with the demand the Minister or any person authorised by him may enter upon and take possession of the station specified in the First and Second Schedules and use the same together with all appliances and instruments thereon.

(b) The Minister shall, during the period the possession and use of the said station, appliances, and instruments are retained on behalf of His Majesty the King, reimburse to the licensee all wages and salaries paid by the licensee to persons employed in connection with the said station, provided that the employment of such persons is necessary for the proper upkeep of the said station, and provided further that such wages or salaries are at the same rates as previously paid by the licensee for similar services.

(c) In the event of the licensee refusing to hand over the said station and appliances on demand, the Minister may immediately thereupon cancel this license without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of the said station and appliances.

(d) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

20. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Minister under or by virtue of these presents, shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the covenant herein contained;

(b) In case of any breach, non-observance, or non-performance by or on the part of the licensee of any of the covenants (other than a covenant for the payment of money) or conditions herein contained, and on the part of the licensee to be observed and performed;

or

(c) In case the licensee fails to comply with any regulation for the time being in force under the Wireless Telegraphy Act 1905-1919.

then and in any such case the Minister may by notice in writing revoke and determine these presents, and the license, powers, and authorities hereinbefore granted, and thereupon these presents and the said license, powers, and authorities shall absolutely cease, determine and become void, but without prejudice to any right of action or remedy which shall have, accrued or shall thereafter accrue to the Minister under the covenants on the part of the licensee, herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time to establish, extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit; neither shall anything herein contained prejudice or affect the right of the Minister from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or to the transmission of messages in any part of the Commonwealth or any Territory under the control of the Commonwealth by means of wireless telegraphy, or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit, and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister by or under the Post and Telegraph Act 1901-1916 or the Wireless Telegraphy Act 1905-1919.

22. Any notice, request, or consent (whether expressed to be in writing or not) to be given by the Minister under these presents may be under the hand of the Minister or any officer authorised by him to act on his behalf, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary at his official address within the Commonwealth.

SCHEDULE I.

PARTICULARS OF THE LAND STATION REFERRED TO IN THIS LICENSE.

Name and Address of Licensee.	Locality of Site of Station.	Nature of Services performed.	Hours of Service.	Normal Range of signalling in miles.		Character of apparatus.		Power.	
				By night.	By day.	System of Radiotelegraphy and Characteristics of the System of Emission.	Wavelength in metres.	Source and maximum output. Maximum to be taken by transmitting instruments.	If Alternator is used. Number of cycles per second.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.

Other particulars:—

SCHEDULE II.

Complete scheme of connections and aerial system authorised to be employed in the herein licensed station.

This drawing, purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed and delivered by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, in the presence of—

This license is accepted by me under the provisions and terms and on the conditions above set out.

Signed, sealed and delivered by the said licensee in the presence of }

NAVIGATION ACT.

G The Commonwealth Parliament passed in 1912 a Navigation Act which contains a clause making it compulsory for ships trading in Australian waters to be equipped with apparatus for wireless telegraphy. This matter is dealt with in section 231 of the Act, and the text of the section given below is as under:—

EXTRACT FROM NAVIGATION ACT,

1912.

DIVISION VI.

231. (1) Except as prescribed, every foreign-going ship, Australian trade ship, or ship engaged in the coasting trade, carrying fifty or more persons, including passengers and crew, shall before going to sea from any port in Australia be equipped with an efficient apparatus for wireless communication in good working order in charge of one or more persons holding prescribed certificates of skill in the use of such apparatus.

(2) For the purposes of this section apparatus or wireless communication shall not be deemed to be efficient unless:

(a) It is capable of transmitting and receiving messages over a distance of at least 100 miles, day and night.

(b) The person controlling the operator undertakes in writing to the Minister to exchange, and does, in fact, exchange, as far as may be physically practicable (of which the master shall be the judge) messages with shore or ship stations using similar or other systems of wireless communication; and

(c) There is provided, in connection with the apparatus, and ready for use whenever from any cause the ordinary supply of electrical power is not available, a battery of accumulators of such capacity as to insure for a period of at least six hours communication of the efficiency prescribed in paragraph (a) of this sub-section.

(3) The equipment shall, if so prescribed, include a silent chamber for the receipt of messages.

(4) The master of a ship required by this section of the regulations to be equipped with wireless telegraphy apparatus shall not take her to sea, and the owner of a ship required to be so equipped shall not permit her to go to sea, unless the requirements of this section have been complied with.

PENALTY: One Thousand Pounds.

(5) The regulations may prescribe the times and hours during which an operator shall be in attendance on the apparatus, ready to receive or transmit messages.

(6) Except as otherwise prescribed, the provisions of this section shall not apply to ships plying exclusively between ports in Australia less than two hundred miles apart.

(7) The Governor-General may make regulations in accordance with the provisions of any International Convention to which the United Kingdom is a party relating to the use of wireless telegraphy on ships, and such regulations may be in addition to, or in substitution either wholly or in part for the provisions of this section.

STATUTORY RULES.

1921. No. 104.

REGULATIONS UNDER THE NAVIGATION ACT, 1912-1920.

H I, the Governor-General, in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this twelfth day of May, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,

W. MASSY GREENE,

Minister of State for Trade and Customs.

NAVIGATION (WIRELESS TELEGRAPHY) REGULATIONS.

1. These Regulations may be cited as the Navigation (Wireless Telegraphy) Regulations, 1921.

2. In these Regulations, unless the contrary intention appears—

"Automatic Apparatus" means an automatic apparatus approved by the Board of Trade of the United Kingdom;

"On Watch" means on watch in the wireless telegraph room of the ship;

"Signal of Distress" means the wireless distress call as specified in Schedule IV to the Act; and

"The Act" means the Navigation Act, 1912-1920.

3. (1) Subject to the next succeeding sub-regulation, these Regulations shall apply to ships (British and foreign) of the classes enumerated in the next succeeding Regulation which—

(a) Carry more than twelve passengers; or
(b) Are of sixteen hundred tons gross registered tonnage or upwards.

(2) These Regulations shall not apply to—

(a) River and bay ships;

(b) Limited coast-trade ships which do not trade beyond 100 nautical miles from principal port of departure; or

(c) Ships not registered in Australia (other than British ships regularly employed in trading from a port in the Commonwealth) unless they take on board, at a port in the Commonwealth, passengers to be conveyed to another port, within or without the Commonwealth.

4. (1) For the purposes of these Regulations ships shall be classified as follows:—

Class I.—Australian trade and foreign-going ships carrying 200 or more persons.

Class II.—(a) Australian-trade and foreign going ships carrying 50 but less than 200 persons; and

(b) Limited coast-trade ships carrying 50 or more persons; and

Class III.—Ships carrying less than 50 persons.

(2) In computing, for the purposes of this Regulation, the number of persons carried by a ship, there shall be included the normal crew of the ship and the maximum number of passengers provided for in the passenger certificate (if any) of the ship.

(3) Until the first day of October One thousand nine hundred and twenty-two all foreign-going ships, when actually carrying less than two hundred persons, including passengers and crew, and proceeding between ports of call in the Commonwealth, shall, notwithstanding anything contained in this regulation, be deemed to be classified in Class III.

5. Those ships only to which these Regulations apply shall be ships which are required to be provided with a wireless telegraph installation, to maintain a wireless telegraph service and to be provided with certificated operators and watchers in accordance with section 231 of the Act.

6. (1) The wireless telegraph installation with which ships are to be provided in accordance with section 231 of the Act shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention for the Safety of Life at Sea, 1914), or of any international agreement superseding the International Radiotelegraph Convention, 1912.

(2) In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade of the United Kingdom, a ship of Class III shall be provided, in addition, with such an apparatus unless the normal duration of the voyage of the ship from one port of call to the next does not exceed eight hours.

7. The installation shall be of the spark or interrupted continuous wave type.

8. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this Regulation as to emergency installations as well as the requirements as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting, by day, under normal conditions and circumstances, clearly perceptible signals from ship to ship over a range of at least 200 nautical miles.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of this Regulation as to range if it is able to maintain, over sea, by day, with a Post Office Standard Station when employing a receiver without amplification devices, communication on a 600-metre wave at a range of one and a half times the number of nautical miles respectively prescribed by this Regulation.

9. There shall be provided, between the bridge and the wireless telegraph room, means of communication by voice pipe, telephone or other means approved by the Director of Navigation, and an operator or watcher when

on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

10. If not fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall be always on watch :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. Two operators, of whom one shall hold a First or a Second Grade Certificate.

(c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Regulations, and either a certificated operator or a certificated watcher shall always be on watch at other times :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and two watchers

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and one watcher.

(c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall always be on watch at the times specified in the Schedule to these Regulations :

Provided that if the duration of the voyage on which the ship is employed does not exceed eight hours from port to port the operator shall be on watch during the whole time of the voyage.

11. If fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by a certificated operator, or by a watcher, or by means of the automatic apparatus :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Two operators, one of whom shall hold a First Grade Certificate.

(b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II or III shall carry one operator, who shall hold a First or a Second Grade Certificate, and while the ship is at sea

the operator shall be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by an operator, or by a watcher, or by means of the automatic apparatus:

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Regulations.

12. For the purposes of the last two preceding Regulations, the number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

13. (1) For the purposes of these Regulations:

(a) An operator shall be deemed to hold a First Grade Certificate if he holds a First Class Certificate of Proficiency issued by the Postmaster-General under the Wireless Telegraphy Regulations 1920 (being Statutory Rules, 1920, No. 256) made under the Wireless Telegraph Act 1905-1919, and has had at least three years' experience as an operator;

(b) An operator shall be deemed to hold a Second Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has at least one year's experience as an operator;

(c) An operator shall be deemed to hold a Third Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has had less than one year's experience as an operator; and

(d) A watcher means a watcher certificated by the Postmaster-General, or by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force.

(2) First, Second or Third Grade Certificates, or equivalent certificates, granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force, shall be accepted as First, Second or Third Grade Certificates within the meaning of these Regulations.

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time*	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea	Meridian of 30° W.; Coast of Greenland	Meridian of 30° E. to the South of the Coast of Africa; Eastern limit of Mediterranean, Black Sea, and of the Baltic; 30° E. to the North of Coast of Norway	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea	Eastern Limit of Zone A	Meridian of 90° E.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean	Eastern Limit of Zone C	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean	Eastern Limit of Zone D	Meridian of 70° W. to the South of the Coast of America; West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico	Meridian of 70° W. to the South of the Coast of America; East Coast of America	Meridian of 30° W.; Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

* NOTE.—Following the practice adopted in the Merchant Shipping (Wireless Telegraphy) Rules, 1920, issued by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919, Greenwich Mean Time is, for the purposes of this Schedule, reckoned from *midnight*, and not from *midday*.

STATUTORY RULES.

1921. No. 132.
REGULATIONS UNDER THE NAVIGATION ACT,
1912-1920.

I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this fourteenth day of July, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,
W. MASSY GREENE,
Minister of State for Trade and Customs.

AMENDMENT OF NAVIGATION (WIRELESS TELEGRAPHY) REGULATIONS.

(Statutory Rules, 1921, No. 104.)

Regulation 4 of the Navigation (Wireless Telegraphy) Regulations is amended by inserting at the end of sub-regulation (1) the following proviso:—

"Provided that, until the first day of October, One thousand nine hundred and twenty-two, all Australian-trade and limited coast-trade ships to which these Regulations apply shall be deemed to be classified in Class III."

STATUTORY RULES.

1921, No. 179.

REGULATIONS UNDER THE NAVIGATION ACT,
1912—1920.

(Second Amendment, 1921.)

I, The Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this fourteenth day of September, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,
W. MASSY GREENE,

Minister of State for Trade and Customs.
Amendment of Navigation (Wireless Telegraphy) Regulations. (Statutory Rules, 1921 No. 104.)

The Navigation (Wireless Telegraphy) Regulations 1921 are amended:—

(a) By inserting at the end of paragraph (b) of sub-regulation (1) of regulation 13 the following proviso:—

"Provided that, where it is shown to the satisfaction of the Director of Navigation that a sufficiency of operators holding First or Second Class Certificates of Proficiency issued by the Postmaster-General and having at least one year's experience as an operator are not available in the Commonwealth, he may to the extent of the deficiency in number of such operators, by writing under his hand, permit of the employment, as Second Grade Operators, of persons holding First or Second Class Certificates of Proficiency but with less than one year's experience as operators, and such persons so employed shall be deemed to be Second Grade Operators for the purposes of these Regulations"; and

(b) By inserting at the end of the Schedule thereto the following proviso:—

"Provided that, until otherwise prescribed, the time of watch for operators on Australian trade and limited coast-trade ships to which these Regulations apply may, in lieu of those set out in the schedule, and at the option of the owner, be in accordance with the provisions of the agreement between the Commonwealth Steamship Owners' Association and others of the one part and the Radio-Telegraphists' (Marine) Institute of Australasia of the other part, dated the 29th March, 1920, certified in the Commonwealth Court of Conciliation and Arbitration on 22nd September, 1920."

AUSTRIA

(See also Map Section)

THE Republic of Austria (Die Republik Österreich) was proclaimed on November 12th, 1918; it forms but a small portion of the erstwhile Austro-Hungarian Monarchy.

It is bounded by Czecho-Slovakia and Germany on the north, Czecho-Slovakia and Hungary on the east, the Kingdom of the Serbs, Croats and Slovenes and Italy on the south and Switzerland on the west. It has an area of 30,766 square miles and a population of 6,131,445.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sektionschef Ing. Anton Stachel	Chief of Section VII for Telegraphs, Telephones and Pneumatic Postal Affairs, Public Department of Communications	Vienna, 1 Borseplatz 1.
Ministerial Councillor Friedrich Teufenstein.	Chief of the Telegraph and Telephone Department	Vienna.

ORGANISATION.

In Deutsch-Altenburg a 25 kW. transmitting installation was erected in the year 1915, and was instituted as a temporary station for general working. Further, there was available as a reserve a 5 T V installation. As a permanent

station the building of a 45 kW. transmitting station in Deutsch-Altenburg was completed in August, 1919, and it started working at that date. The 5-T V station still continues in existence as a reserve station.

At present the Austrian Telegraph Administration possesses a long distance radio station in Deutsch-Altenburg and also one at Laaerberg. The latter is on the Poulsen System. There is also at Wein-Burg a receiving station with Braun frame receivers. These stations are all under the control of Section VII of the Public Department of Communications.

For the forwarding of correspondence only the radio installations of the State Administration are used in Austria. The other installations, for which concessions have been granted, serve either for experimental purposes or for the testing of radio installations of private firms.

The Austrian Government, with the consent of the National Legislative Assembly, has decided to entrust the organisation of commercial wireless telegraphy in Austria to the Marconi Wireless Telegraph Company of London, who have undertaken to form within six months an Austrian Marconi Company, with its registered office in Vienna. The London Marconi Company will subscribe more than half the capital, the Austrian Government will subscribe 30 per cent.

The London Marconi Company will erect two transmitting stations and three receiving stations near Vienna and one control station in the centre of Vienna, and hand them over ready for use to the Austrian Marconi Company, which will immediately after registration take over the concession. This concession confers the exclusive right of conducting public wireless services between Austria and all other countries for a minimum period of thirty years.

ADMINISTRATION.

The issue of regulations relative to wireless telegraphy in connection with aviation, time, weather, and meteorological reports is under consideration.

The following decree regulates the administration of wireless telegraphy in the Republic:—

A—Decree of Ministry of Commerce, 7th January, 1910.

A The following Decree of the Ministry of Commerce, dated January 7th, 1910, is concerned with wireless telegraph stations in the Austrian Empire, on board Austrian ships, and on ships of foreign nationality in Austrian territorial waters:—

(1) In accordance with a High Decree of Parliament of January 16th, 1847, and the Decree of the Ministry of Commerce, dated April 28th, 1905, the erection and working of Wireless Telegraph stations in the Austrian Empire and on Austrian ships is a State concession to acquire which a written application (liable to Stamp Duty) containing a description of the station and a diagram of connections, must be submitted.

(2) The choice of system, apparatus, and fixtures, as well as the establishment of coast and land rates within the limits of the Wireless Telegraph Agreement of 1909, and the supplemental regulations are the prerogative of the Ministry of Commerce.

(3) The general regulations for Wireless Telegraph stations on board ships are shown below.

(4) Wireless Telegraph stations on board ships must fulfil the following conditions:—

(a) They must be of equal technical effi-

ciency to systems other than that adopted in the stations, and they must be able to inter-communicate with other systems.

(b) The system adopted must be one of "syntonisation."

(c) The speed of transmission and reception must not, under normal circumstances, be less than twelve words (each of five letters) per minute.

(d) The power possessed by the apparatus must not exceed, in normal conditions, 1 kilowatt. A greater power can be used when the ship is under an obligation to exchange messages at a longer distance than 300 kilometres from the nearest coast station, or when the transmission can only be effected by means of a higher power than specified.

(5) The working of Wireless Telegraph stations on board foreign ships in Austrian territorial waters is dependent upon the previous grant of a State concession. This regulation does not apply to warships or ships in distress. If a foreign vessel employs its Wireless Telegraph station without authorisation, the State authorities may take steps to prevent the working of the station in Austrian territorial waters.

BAHAMAS

(See under BRITISH WEST INDIES.)

BAHREIN ISLANDS

(See under PERSIAN GULF.)

BASUTOLAND

(See also Map Section)

BASUTOLAND, an inland native territory of South Africa lying between $28^{\circ} 45'$ and $30^{\circ} 40'$ S. latitude, and a longitude of $27^{\circ} 0'$ and $29^{\circ} 30'$ E., is governed by a resident Commissioner under the direction of the High Commissioner for South Africa and located at Maseru, its principal town. The latter high official possesses legislative authority which is exercised by proclamation. The "Territory" covers an area of 11,716 square miles, and has been directly under the authority of the Crown since 1884; it forms an irregular parallelogram on the north-east of the Cape Colony. The population is about 500,544.

ADMINISTRATION.

In 1904 a proclamation was issued, which we print below, making provision for the working of wireless telegraphy within the territory, but at present there are no wireless stations.

A—Proclamation making provision for Wireless Telegraphy.

A PROCLAMATION. No. 5 of 1904.

By His Excellency the High Commissioner for South Africa.

Whereas it is expedient to make provision for the working of wireless telegraphy within the territory of Basutoland;

Now therefore by virtue of the powers in me vested I do hereby proclaim, declare and make known as follows:

1. No person shall establish or use any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires without having previously obtained a license as hereinafter provided.

2. (1) It shall be lawful for the Resident Commissioner to authorise the issue of a license for either of the purposes mentioned in section 1 and to revoke the same at any time, and there shall be payable in respect of such license the sum of one hundred pounds.

(2) Every such license shall be deemed to be granted upon such terms and conditions as

the High Commissioner may from time to time prescribe by notice in the *Gazette*.

3. Any person who shall establish or use or attempt to establish or use any such apparatus or installation as is mentioned in section 1 in contravention of the provisions of this Proclamation shall be liable upon conviction to a penalty not exceeding two hundred and fifty pounds and in default of payment to imprisonment with or without hard labour for a period not exceeding three months and in case of a second or subsequent conviction to a penalty not exceeding five hundred pounds or in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

4. This proclamation shall take effect from the date of its publication in the *Gazette*.

Given under my hand and seal at Johannesburg this twenty-fourth day of February, One thousand nine hundred and four.

MILNER,
High Commissioner.

BATHURST

(See under GAMBIA.)

BECHUANALAND PROTECTORATE

(See also Map Section)

LYING between the Molopo River on the South and the Zambesi in the North and extending from the Transvaal Province and Matabeleland on the east to South-West Africa, the Bechuanaland Protectorate comprises some 275,000 square miles and has a population of about 152,983.

It is under the government of a Resident Commissioner with headquarters at Mafeking in the Cape Province.

ADMINISTRATION.

With the exception of the passing of legislation making provision for the working of Wireless Telegraphy within the Protectorate nothing has taken place in connection with Wireless Telegraphy and Telephony.

A—Proclamation No.6 of 1909. (Text not to hand).

BELGIAN CONGO

(See also Map Section)

FOUNDED in 1885 by the late Leopold II, King of the Belgians, the Congo "Free State" was placed under his sovereignty. It was subsequently annexed by Belgium under the Provisions of the Treaty of

November 28th, 1907. The governing body of the colony consists of fourteen members, eight of whom are appointed by the King of the Belgians, three chosen by the Senate, and three by the Chamber of Representatives. The King is represented in the colony by a Governor-General assisted by several Vice-Governors-General. Its area is estimated at nearly one million square miles, and it possesses a population of about eleven millions.

CONTROL.

The wireless telegraphic service of the Belgian Congo possesses a General Directorate at Brussels and a Local Directorate at Stanleyville, in the colony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
<i>At Brussels—</i>		
Lt.-Col. Adjoint d'E. M. Wibier	Director-General	2, Rue de L'Esplanade, Brussels
M. François Bezerie ..	General Secretary	Do.
M. Raymond Brailard ..	Chief Engineer	Do.
<i>In the Congo—</i>		
M. Fernand Bourguet ..	Director	Stanleyville
M. Mathieu ..		Coquilhatville
M. Van Cleynenbreughel)	Controllers	Stanleyville
M. Mouchet ..		Elizabethville

The network with Boma at the head is divided into sections comprising 15 stations as follows:—

(1) The section of the Bas-Congo-Kasai, comprising the stations of Banana (the coastal station), Kinshasa, Lusambo.

(2) The section of the Equator: Coquilhatville (being reconstructed to C.W.), Basankusu, Umangi-Lisala, Basoko, Buta.

(3) The section of Stanleyville (being replaced by a high power C.W. station to communicate direct with Elizabethville 1,360 km. and Kanga 1,500 km.), Bunia-Kilo.

(4) The section of Lualaba: Kindu, Kongol, Lukuga, Kikondja, Elizabethville (being reconstructed as Stanleyville to communicate direct to Boma-Kanga, 1,680 km.).

There is a station at Kigoma on Lake Tanganyika, formerly in German East Africa, which is now part of the Belgian Congo system.

In addition to these there is a small station at Usumbura, which is looked after by the Special Administration of the Urundi-Ruanda. The wireless telephone stations (C.W.) are set up around Tchikapa (Kasai).

At the head of each section is a chief, assisted by chief operators of stations and constructional engineers.

ORGANISATION.

As a result of his travels in the Congo, King Albert was impressed with the great inconvenience caused by lack of suitable communication between the principal settlements of this vast colony, and decided from that moment to remedy this defect.

At the end of 1910 he drew up a programme in three parts of which the first consisted of linking Boma with Banana as a test. On the results obtained was to be considered the question of instituting another section, that of communication between Boma and Elizabethville, a much more important scheme in view of the fact that this part of the colony had never before made use of wireless telegraphy. The third point included wireless communication between the Congo and Belgium, at first by means of relay stations, and subsequently direct.

In January, 1911, the first two stations were installed—at Banana and Boma—able to communicate with the coast station at Loango which was, in turn, the terminal point of a submarine cable. The same year the King charged Mr. Goldschmidt and Captain (now Lt.-Col.) Wibier to instal a chain of stations in such a way as to form a wireless nexus throughout this vast territory. As a result Kinshasa, Coquilhatville, Lusambo, Bansankusa, Umangi-Lisala, Basoko, Stanleyville, Kindu, Kongolo, Kikondja, and Elisabethville stations were erected.

This network has been completed, and during the war the stations of Bunia-Kilo and Lukuga were opened to service. Actually there are fifteen wireless stations now working in the Belgian Congo. In addition there are under construction a station at Buta, in the district of Uele, and a powerful inter-continental station at Kanga (Boma), the latter destined for direct communication with Belgium.

Finally, steps are being taken which it is hoped will enable the three local capitals of Boma, Stanleyville and Elisabethville to directly inter-communicate without resorting to the use of relay stations.

The general traffic dealt with by the system exceeded 500,000 words in 1913, and 5,000,000 words in 1920, and is being increased daily.

There are no stations utilised for aviation purposes.

All the stations intercept press telegrams from Europe, which are sent free to the colony. They receive also time signals from Lyons.

During 1921 the first attempts at Wireless Telephony were made in the district of Tchikapa (Kasai). They were undertaken by Mr. Goldschmidt for the International Society of Forestry and Mining, who installed a private station to relay them to the main system; they are, however, not yet finished.

ADMINISTRATION.

The rules under which wireless telegraphy is administered in the colony are those of the Wired Telegraphic Service now in force. There are none specially devoted to wireless. The staff has to pass a severe examination at the headquarters at Brussels which decides the engagements.

BELGIUM

(See also Map Section)

BELGIUM, after being joined with Holland from 1815, formed itself into an independent State in 1830, under Prince Leopold of Saxe-Coburg, who ascended the throne on July 21st, 1831. According to the constitution of that date, Belgium is "a Constitutional Representative and Hereditary Monarchy," the legislative power being vested in the King, the Senate and the Chamber of Representatives. The present King Albert, born on April 8th, 1875, succeeded his uncle on December 17th, 1909.

The total area of the kingdom is estimated at 11,744 square miles, with a population of 7,684,272.

CONTROL.

Wireless telegraphy in Belgium is under the control of the Ministry of National Defence with regard to the Army and Navy and the Telegraph and Telephone Administration, which forms one of the departments of the Ministry of Railways, Marine, Posts and Telegraphs for public service.

For technical purposes the Administration is divided into two departments and seven districts. Each district, administered by an engineer-in-chief and assisted by a principal engineer and other engineers, includes several sections or special technical services.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. X. Neujean ..	Minister of Railways, Posts and Telegraphs ..	Brussels
Mr. A. Roosen ..	Director-General of Telegraphs and Telephones ..	Do.
Mr. Pierrard ..	Director-General of Marine ..	Do.
Mr. E. Piérard ..	Chief Engineer, Director of Telegraph Administration ..	Do.
Mr. A. Deldime ..	Director of Telegraph Administration ..	Do.
Mr. d'Ardenne ..	Chief Engineer, Director of Service, Chief of Technical Office, Telegraph Department ..	Do.
Mr. M. Henrion ..	Chief Engineer, Director of the Service of Special Apparatus, Radiotelegraphy and Radiotelephony ..	Do.
Mr. Sadzot ..	Principal Engineer, Technical Office, Telegraph Department ..	Do.
Mr. R. Corteil ..	Principal Engineer, Wireless Section ..	Do.
Mr. C. Caenepenne ..	Engineer, Wireless Section ..	Do.
Mr. R. Legueux ..	Engineer, Service of Special Apparatus Radiotelegraphy and Radiotelephony ..	Do.
Mr. Van Heemstée ..	Assistant Engineer, Wireless Section ..	Do.

ORGANISATION.

In 1901, when wireless was still in its infancy, trials were made between La Panne and a Belgian mail boat, to which trials, Mr. A. Roosen, Director-General of Telegraphs; Mr. Pierrard, Director-General of Marine; and Mr. E. Pierard, Director of the Telegraph Administration, devoted all their attention, and contributed to the application and development of wireless in Belgium.

The results obtained having been adjudged sufficiently satisfactory for the establishment of wireless between the mail boats and the Belgian coast, provision was made in 1902 for the installation of a coast station at Nieuport (Bains)*, and of ten stations on the mail boats, for the purpose of increasing the security of navigation of these ships. This was the first public wireless service inaugurated on any ship afloat.

As progress was made in the domain of wireless, experiments were undertaken to establish the value of improved methods and new apparatus. These trials led in 1909 to plans for completely reorganising the original installations. Subsequently, modifications were introduced at Nieuport (Bains)* and to the mail boat installations.

A temporary station is in operation at the waterworks at Ostend until the new Ostend station is ready, and is fitted with a 5 kW. Marconi musical spark installation, as well as with a 1½ kW. Marconi installation.

Another station is in operation at the Pilot House at Antwerp, fitted with a 1 kW. S.F.R. installation.

An intercontinental station is under construction at Ruysselede, near Bruges, which will enable communication to be maintained direct with North and South America and the Belgian Congo. In addition, a Belgium-Great Britain-France station equipped with high speed apparatus is also to be established.

There is a C.W. valve station at the aerodrome at Evere (BAV) with a range of 400 kilometres for aeroplane route service; also the observatory at Uccle (H.S.) possess a C.W. valve station for aviation and general meteorological bulletins.

ADMINISTRATION.

The administration of Wireless Telegraphy in Belgium is regulated by a Law and Royal Decrees, which are reprinted below:—

A—Law of July 10th, 1908, regulating the use of wireless telegraphy and telephony.

B—Royal Decree of October 19th, 1908, regulating the application of charges on wireless messages.

* Destroyed during the war.

- C—Royal Decree of November 3rd, 1913, regulating the conditions of installation and the working of wireless stations.
- D—Decree regulating ships' licenses, September 10th, 1918.
- E—Technical and administrative regulations relating to ship stations, October 15th, 1918.*
- F—Circular No. 1 of October 18th, 1918, addressed to shipowners.
- G—Decree of August 7th, 1920, regarding Amateur Wireless installations.
- H—Extracts from Royal Decree of November 8th, 1920, relating to regulations for ships.

A

**I. LAW OF JULY 10TH, 1908,
RELATING TO TELEGRAPHY
AND TELEPHONY BY ETHER
TRANSMISSION.**

ART. 1.—The Government is authorised to undertake the establishment and transmission of wireless telegraphy and telephony by ether waves.

ART. 2.—On Belgian territory or on board of a Belgian steamer or vessel no one is allowed without authorisation previously obtained from the Government to erect, establish or cause to be erected or work apparatus for radio transmission capable of carrying out or prejudicing communications.

Each infraction of the clauses of the provisions of the present Article involves liability to a fine varying from 200 to 2,000 francs, together with imprisonment varying from eight days to a year, or either of these penalties alternatively. Such infringement will carry the additional penalty of confiscation for the benefit of the State of the apparatus and all other objects specially designed for their working. Moreover, the Law Officers shall be able to order suspension in the carrying out of the confiscation of all apparatus and other objects or of a part thereof by placing them in temporary sequestration for a term which may be fixed by the tribunal. This sequestration shall be raised if the interested party or his legal representative shall obtain authorisation to make use of the apparatus. In default of such authorisation, the confiscation of his effects shall take place immediately on the expiry of the term fixed under the judgment, unless the competent Minister shall authorise the delinquent either to destroy the apparatus or to transfer its possession to a duly authorised concessionaire.

The preceding arrangements shall apply even in case of acquittal of the accused, when it has been established that the apparatus and other objects giving rise to the prosecution come under the category covered by the two first paragraphs of the present Article.

ART. 3.—The Government shall fix the rates, as well as the rules of administration and order relative to radiotelegraphy and telephony. Infringement shall be punished in accordance with the penalties established by the law of March 6th, 1908.

ART. 4.—The authorisations referred to in Art. 2 are granted by the Minister exercising jurisdiction over the telegraphic and telephonic services in agreement with the other ministers affected. They shall specifically enumerate their duration, the conditions of installation, use of apparatus, charges where such are made, royalties payable to the public treasury, penalties for infringement and all other limit-

ing conditions, dictated by the interests of public order, as well as by the security and defence of the realm. In the event of infringement of the conditions of authorisation, the latter may be withdrawn by the Minister who granted it. Nevertheless, no royalty can be claimed when it has been proved to the satisfaction of the Minister in Charge of the granting of authorisations that the applicant has no other object than that of experimenting with or making use of the apparatus for his private purpose without making any charge whatsoever.

ART. 5.—No one can establish or work on board a foreign ship or vessel apparatus for radio transmission which can carry out or prejudice radiotelegraphic or radiotelephonic communication, so long as the ship, or vessel, is located in Belgian Territorial Waters, if its action be not in accord with the prescribed regulations set out in Art. 3. The competent Minister may at any time forbid the use of apparatus, or lay down with regard thereto such measures of precaution, supervision and control as he judges necessary.

All infringements of the regulations of the present Article are liable to a fine of 100 to 500 francs. The Law Officers may order the sequestration of apparatus, and of all other objects specifically adapted to their working, for the duration of the stay of the aforesaid vessel in Belgian waters. Such sequestration may be annulled if the interested party obtain from the competent Minister an authorisation to make use of the apparatus in question.

If, after the annulment of the sequestration, the interested party commits a fresh infraction of the conditions laid down, the fine may be doubled and the apparatus and other objects confiscated for the benefit of the State.

ART. 6.—If for any cause, either by reason of public order or the security and defence of the realm, the Government shall judge necessary to suspend the whole, or part of the service, the concessionaire shall be obliged to obey the first instructions given him to that end.

In the same circumstances the competent Minister may either order the apparatus to be put out of action or sequestered, or he may put the apparatus in the hands of his own agents instead of those of the concessionaires. These measures shall be taken for the duration of the period judged necessary by the Government and shall give rise to no claim for indemnification at the hands of the State.

ART. 7.—The penal laws relative to wireless telegraphy and telephony are applicable to governmental radiotelegraphy and telephony, as well as to such installations and services as have been duly authorised for public communication.

* The Regulations of October 15th, 1918, are specially adapted for wartime, and will soon be modified to suit peace conditions.

ART. 8.—The Government may designate the functionaries who shall be sworn in as officers of judiciary police for the investigation of the infringement relative to wireless telegraphy and telephony. The official reports drawn up by these functionaries shall be considered correct until they are proved otherwise.

The above-mentioned functionaries shall take precedence, so far as infringements relative to wireless telegraphy and telephony are concerned, over all other officers of judiciary police, with the exception of the Public Prosecutor and the Police Magistrate.

ART. 9.—When there are found to be sufficient traces of the existence of wireless telegraph or telephone installations not regularly authorised or employed, the police magistrates shall visit the localities in which the aforesaid installations shall be presumed to exist, in order to make all necessary investigations into the truth of the allegations, even although it may be necessary to secure access to private property for that purpose.

He may take with himself one or more experts or functionaries sworn in in accordance with the terms of the preceding Article.

He may either effect himself or cause to be effected, by any and all of the officers of the judiciary police, seizure or dismantlement or temporary sequestration of the apparatus set up or employed without regular authorisation, as well as that of all other objects subject to confiscation in accordance with the terms of Arts. 2 and 5 heretofore set out.

ART. 10.—The State undertakes no responsibility for the service of communication by radiotelegraphic or radiotelephonic means.

ART. 11.—The present law shall come into operation the day after its publication.

B 2.—ROYAL DECREE OF THE 19TH OCTOBER, 1908, RELATING TO CHARGES FOR RADIO-TELEGRAMS.

Royal Decree authorising the Minister of Railways, Posts and Telegraphs to settle the amount of charges fixed when necessary in the authorisation for delivery by application of Articles II and IV of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony by ether transmission.

In view of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony;

In view of the International Radiotelegraphic Convention concluded at Berlin in 1906 and the further Acts which complete it:

and

Inasmuch as it is desirable to simplify—so far as charges are concerned—the formalities which appertain to the delivery of Acts authorising the establishment and working of ether transmission, at the suggestion of our Minister of Railways we hereby agree:

Sole Article.—Within the limits fixed by the International Convention relating to Radiotelegraphy and Telephony, our Minister of Railways, Posts and Telegraphs is hereby authorised to settle the amount of charges, when such arise, in the authorisations which he is empowered to issue under the authority of Articles II and III of the Law of the 10th July, 1908.

Given at Laeken, the 29th October, 1908.

(Sgd.) LEOPOLD.

C 3.—ROYAL DECREE OF THE 3RD NOVEMBER, 1913, RELATING TO THE CONDITIONS UNDER WHICH WIRELESS TELEGRAPHY SHALL BE INSTALLED AND WORKED.

In view of Art. III of the Law of 10th July, 1908, which authorises the Government to settle the rules of administration and police relative to radiotelegraphy and telephony:

In view of the Law of 6th March, 1908, relating to the penalties incurred by contravention of general measures of interior administration, as well as to the penalties which may be inflicted under the rules laid down by provincial and communal authorities:

and

In view of the proposal of our Minister of Marine, Posts and Telegraphs, we have settled and hereby decree:

ART. 1.—On Belgian territory and on board ships or vessels of Belgian nationality, every and each proposal for the installation of apparatus for ether transmission, capable of assisting or prejudicing the transmission or reception of radiotelegraphic or radiotelephonic signals, as well as all proposals for modification in their employment, and also every and each proposal for the erection or modification of an installation which has already been duly authorised, ought to be submitted to the Department of Marine, Posts and Telegraphs as a preliminary to their starting operations.

Any request for authorisation must indicate the character of the installation, the object of its use, so far as concerns wireless stations on board ship, tariff of charges proposed, detailed list of the apparatus and of the methods of working, wavelengths, hours of watch, and generally all information of a character such as will facilitate detailed examination of the scheme. There shall be moreover thereon set forth the steps it is proposed to take to prevent interference with the service of other official or authorised stations.

ART. 2.—Such authorisations are issued subject to the reservations and conditions which may be judged necessary in the interests of the convenience and defence of the realm, including the safeguarding of public and service messages.

ART. 3.—A new authorisation becomes necessary:

1. If the station has not been installed or modified and put in working order within the period fixed by the Decree of Authorisation.

2. If it has been put in working order or made use of under the conditions other than those set out in the Decree of Authorisation.

ART. 4.—Installations not regularly authorised which shall have been set up previous to the coming into force of the present Decree shall not be privileged thereby: their service must be suspended and a request for authorisation applied for under the conditions and forms set out under Article I of the present Decree.

ART. 5.—On entering into Belgian territorial waters foreign ships fitted with wireless installations capable of assisting or prejudicing transmission or reception of radiotelegraphic or radiotelephonic signals shall cease communication with any neighbouring stations other than the nearest State stations. They shall announce their presence to these coastal stations and await authorisation or invitation to communicate either with the aforesaid or some other coastal station.

The preceding arrangements shall not apply to foreign ships and vessels, provided that previous to their entering within Belgian territorial waters they shall have been provided under order of the competent Belgian Minister with his special and regularly accredited permit for communication. They shall not interfere in any way with distress signals or the answers to distress signals emanating from other ships or vessels.

To sum up: Foreign ships and vessels are enjoined from the time of their entering into Belgian territorial waters to cease all working which may prejudice the communications of any radiotelegraphic or radiotelephonic stations whatsoever.

ART. 6.—On Belgian territory and within Belgian territorial waters as well as on board Belgian ships and vessels located in foreign waters, duly appointed delegates of the Government shall have free access at all hours of day and night, in accordance with Article VIII of the Law of 10th July, 1908, to all ships, vessels and steamers on which regularly authorised installations may be working, or for which a communicating permit has been granted. The owners, managers, charterers, commanders, agents, masters, and personnel are enjoined to facilitate by every possible means the duties of verification and control vested in these delegates.

ART. 7.—The owners, managers and charterers are civilly responsible for the payment of fines decreed against their commanders, directors, agents, masters, or personnel. Our Minister of Marine, Posts and Telegraphs is charged with the execution of the present Decree.

ART. 8.—The present Decree shall come into force the day after its publication dated Brussels, 3rd November, 1913.

4.—DECREE OF THE 10TH SEPTEMBER, 1918, RELATING TO SHIPS' LICENSES.

Albert, King of the Belgians, to all here present and to come, greeting.

In view of Art. 26 of the Constitution which confers the exercise of legislative power on the Ruling Sovereign, in concert with the Chamber of Representatives and the Senate; and in view of the impossibility of assembling the Legislative Chambers.

Under the advice of our Minister of Railways, Marine, Posts and Telegraphs, and Foreign Affairs, and in conjunction with our Ministers united in Council we have decreed and do decree.

ART. 1.—On and after 15th October, 1918, it is enacted that before starting from either a Belgian port or a port belonging to an allied or neutral nation of Belgium, sea-going vessels engaged, or that may become engaged wholly or partially in commercial transport, must be furnished with a license issued in the name of the Minister of Railways, Marine, Posts and Telegraphs, by the Director-General of Marine or by his representative.

ART. 2.—Other requests for licenses must come from the shipowner or charterer or their agents and must be set out in writing in conformity with the provisions of a model approved by Ministerial decree.

ART. 3.—Every license shall be issued for one or several voyages or for a limited period. Any license given for more than a single voyage is always liable to cancellation.

ART. 4.—A license will be refused whenever the authority entrusted with the investigation of the request shall judge that the vessel may—so far as the itinerary or conditions of shipment are concerned—be utilised in a manner more convenient for national interests than it would be if the voyage were carried out under the arrangements set forth in the application, or when such a voyage as that therein set forth would unduly expose the vessel to the risks of war, which the national interests demand shall be avoided.

ART. 5.—A license shall be also refused if the authority entrusted with the investigation of the request shall judge that by its general condition, or that if its engines, fittings, means of defence, or composition of personnel, the vessel is insufficiently well-found with regard to safety for the voyage for which the license is being requested.

ART. 6.—Marine Commissioners, Consuls, and Agents designated for that purpose by the authority entrusted with the consideration for the request for license, shall have the right of access at all times and in all places on board of Belgian sea-going vessels with the object of investigating whether the aforesaid vessel fulfils the conditions necessary for the granting of a license or whether the conditions under which the license may have already been granted are well and duly carried out.

Every owner, charterer, or master is enjoined to give the aforementioned officials every necessary aid in the discharge of their duties.

ART. 7.—The Marine Commissioner in Belgian ports and the Belgian Consul in foreign ports may, without prejudice to Art. 9 of the Decree of the 2nd February, 1916, withdraw the permission to navigate from any vessel not furnished with a license or which shall navigate in violation of the conditions of the present Decree.

They shall be able to arrest, or have it put under arrest by the local authorities—the ship may even be prohibited from putting to sea.

ART. 8.—In the event of violation of the regulations of the present Decree, the Marine Commissioner or the Council shall draw up a circumstantial indictment, every item of which shall hold good until disproved. A copy of this indictment will be sent within 24 hours to the captain of the ship.

ART. 9.—The captain, shipowner, or charterer, who may at any time have been guilty of an offence against the regulations of the present Decree, shall be liable to imprisonment varying from a week to two years, together with a fine varying from 26 frs. to 2,000 frs., or, alternatively one of these penalties. Confiscation of the ship will be enforced, and if enforcement be not possible, the tribunal shall substitute therefor the payment of a fine equal to the value of the vessel.

If there be any extenuating circumstances, the confiscation of the vessel, or the payment of a sum equal to its value, may be obviated in consideration of a payment of some sum less than its value.

ART. 10.—All the provisions of Section I of the Penal Code apply to the infringement of regulations set out in the present Decree.

ART. 11.—Any individual, Belgian or foreign, who shall commit outside the Royal domains, an offence against the present Decree, can be proceeded against in Belgium. If he does not appear, judgment may be passed in default.

ART. 12.—So far as the present Decree is concerned, by "captain" may be understood any person who exercises the captain's function on board.

We hereby promulgate the present Decree and order that it shall be sealed with the State Seal and published in the *Moniteur*.

Given at our Headquarters,
10th September, 1918.

Sealed

(ALBERT).

REGULATIONS RELATING TO TECHNICAL CONDITIONS, INSTALLATION, UPKEEP, SURVEY AND TRAFFIC OF RADIOTELEGRAPHIC STATIONS ON BOARD BELGIAN VESSELS.*

Dated 15th October, 1918.

ART. I.

Systems of Radiotelegraphic Apparatus.

The choice of wireless apparatus and arrangements to be employed is left open under the express reservation of parliamentary approval, by the Department of Railways, Marine, Posts and Telegraphs of Belgium, which is entrusted with the supervision and control of Radiotelegraphic Installations on board Belgian ships.

Account will be principally taken of the efficiency of the system from all points of view, including the reliability of machines and apparatus, facilities for supervision, for the upkeep of the station, for the replacement of apparatus or parts which may be damaged.

It is extremely desirable, however, that choice should be made of a system with a musical note. Such a kind of note will be obligatory for vessels plying in tropical zones.

ART. 2.

Construction of Radiotelegraphic Installation (Conditions to be fulfilled).

Installations must fulfil the conditions laid down in the Radiotelegraphic Convention of London, 1912, and the supplements thereto, modified by the present code of Rules and later on by subsequent regulations.

(a) *Principal Transmitting Station.*—Radiotelegraphic installations must be able to transmit by day, from one ship to another of the same class, signals which can be clearly read under normal circumstances and conditions at the minimum distance laid down hereafter.

200 nautical miles (about 1,852 metres) for vessels of 6,000 tons and upward.

100 nautical miles for vessels of 3,000–6,000 tons.

75 nautical miles for vessels of 1,500–3,000 tons.

40 nautical miles for vessels of less than 1,500 tons.

Special conditions with regard to range may be imposed for vessels devoted partly, or wholly, to long distance passenger traffic, or such vessels as ply under special traffic conditions.

With the object of enabling the operator to keep himself effectively in touch with, and to regulate the working of the transmitting station, and the energy radiated therefrom by the antennæ-earth circuits, there shall be supplied an unshunted thermal ammeter, specially adapted for measuring currents of high frequency.

It must be possible to pass rapidly from a wavelength of 600 metres to that of 300 metres and vice versa.

* These Regulations are specially adapted for wartime, and will soon be modified to suit peace conditions.

(b) *Apparatus for Syntonisation and Reception.*—Besides the regulating arrangements relative to the reception of wavelengths of 600 metres or less (see Service Regulation annexed to the London Convention of 1914, Art. 7, Section C), the apparatus must allow for reception, with a margin of insurance against interference of transmissions operated on a wavelength up to 3,000 metres.

Use must be made of sensitive and very stable detectors specially adapted for the reception of musical notes.

The reception apparatus must include at least two detectors.

Arrangements must be made for avoiding any induction due to badly established electric circuits, or to any other cause which may tend to obscure faint signals.

Some suitable arrangement must ensure the silence of receiving telephones during transmission, whether the latter is being made through the main station, or the emergency set.

A suitable and conveniently placed buzzer must be carried for the verification of the satisfactory working of the different circuits of the reception apparatus and of the detectors.

(c) *Emergency Transmitting Gear.*—Every board-ship station, whatever may be the constitution of its principal Transmitting Station, must include an emergency set, in conformity with Art. 11 of the Regulations of Service appended to the International Radiotelegraphic Convention of London, with the object of ensuring the possibility of reception when the current of the ship's generator fails, or some mischance puts the principal station out of action.

This emergency set must of necessity be actuated by an accumulator battery with a sufficient capacity and of at least 24 volts. If, however, the principal transmitting station carries an accumulator battery suitably equipped and located, this battery or a part thereof, may serve as the source of energy of the emergency gear.

The emergency set must have a minimum range of 80 nautical miles for vessels of 6,000 tons and upward; or for those of smaller tonnage, partly or solely engaged in long distance passenger service; of 50 nautical miles for vessels of 1,500–6,000 tons which do not come under the above-mentioned category; of 30 nautical miles for vessels of less than 1,500 tons.

When the emergency set includes an induction coil it must be possible to utilise it: (a) for transmitting by direct excitation (plain aerial); (b) for the emission of syntonised and slightly damped waves obtained by feeding the condenser of the primary oscillating circuit of the principal set from the secondary of this coil.

The above apparatus must allow of a rapid change from one of these methods of transmission to the other.

All arrangements must be made so that the emergency set may be put into action instantaneously.

ART. 3.

Antennæ.

(a) *General Conditions.*—Antennæ must always be maintained in perfect condition, not only with regard to rigidity but also with regard to electrical resistance.

All the connections of antennæ must be rigidly soldered with the greatest care. Soldering must be carried out with resin to the exclusion of all liquid which might act on metal.

Every precaution must be taken that no strain be put upon a soldered joint, or upon any part which has been heated.

The same precautions must be taken in the case of a broken connection.

Besides the principal antennæ which is in everyday use, there shall be carried on board a single-strand antenna in reserve as well as a small emergency antenna.

(b) *Principal Antenna*.—This must be of a multiple-stranded type strongly fixed.

This antenna must be furnished with straying guides suitably insulated, with their ends attached to the yards in order to avoid shifting under wind-strain or the motion of the ship.

(c) *Reserve Single Strand Antenna*.—In order to afford a temporary stopgap when the principal antenna has been badly damaged by bad weather and when circumstances render reconstruction impossible for some little while, and with the object of carrying on a makeshift radiotelegraphic service, every vessel must carry a single strand reserve antenna of a convenient shape and size. This antenna shall be stretched on a special support furnished with its own insulator—constructed of an unbreakable and elastic material like rubber or caoutchouced rope—and placed in the wireless cabin ready for the operator's use.

The two masts intended to serve as support shall be furnished each with a reserve block fixed as high as possible and with a continuous haliard serving exclusively for the haulage of the single strand antenna. These blocks and gear for the spare set must always be maintained in perfect order.

(d) *Emergency Set*.—Experience has shown that the explosion of a torpedo or a mine fairly frequently entails the fall of a mast, and consequently tears down the antennæ at the same time, thus preventing the vessel from sending out wireless calls for aid.

In order to neutralise the consequences of such a mishap every ship must be furnished with a small emergency antenna *totally separate from the masts*.

This antenna must be multiple stranded with the object of ensuring a sufficient sending range. It may be of a prismatic or cylindrical type with four or six strands (of the pattern usually spoken of as "sausage"); it shall be fixed by the aid of blocks, say, on one side to the top of a funnel and on the other to the apex of a small spar attached to the wireless cabin or the wheel house, etc.

This antenna should be given as much extension, both from the point of view of capacity and height, as it is practically possible under the circumstances. In the neighbourhood of a funnel it would not be possible to use for its fixture either blocks, insulators or fastening material which might be affected by heat or steam such as ropes, ebonite, rubber, etc.). This emergency antenna must be permanently fixed on the exterior to an insulator with a special lead-in of a type similar to the insulator of the main antenna. Every care must be taken to ensure the practicability of its being instantly connected with the apparatus for transmission and reception in the interior of the cabin.

(e) *Metal Stays*.—The metal stays of masts and other gear, arranged more or less parallel and at a short distance from the strands of the antennæ, must be effectively broken by insulators of high mechanical strength in such a way as to avoid any appreciable absorption of energy.

(f) *Tension of Antenna Stays*.—Care should be taken against stretching the stays too tightly so as to avoid antennæ being torn away

in consequence of severe vibrations of the mast head caused by explosion, collision, etc.

ART. 4.

Electric Generating Group.

Every electric generating group must be constructed and arranged so as to maintain continuous service.

(a) *Ship's Regular Generators*.—If there be machinery on board for lighting the ship, etc., it can equally well serve for supplying energy to the wireless station, provided that when all the apparatus for which it is normally employed is being served there remains an ample supply of electric power for working the radiotelegraphic installation.

(b) *Special System*.—For this purpose it is necessary to choose a very rigid system of construction which is not liable to derangement by powerful shocks and which can be quickly connected up. No systems of electro generation shall be allowed which do not possess a minimum power of $2\frac{1}{2}$ kw. with compound excitation on the dynamo, machines of less power not being of the requisite robust qualities. A power of $2\frac{1}{2}$ kw. must be exclusively reserved to the wireless station and contingently to the lighting of the wireless cabin. In the interests of the safety of the ship the electric generating group must be placed as far as possible in the upper part of the machinery room, or, if it consists of an internal combustion motor, in the immediate neighbourhood of the wireless telegraph station, but so situated that working does not interfere with the operator.

(c) *Working*.—The electric generating system shall work continuously throughout the voyage and the current must be always at the disposal of the operator.

In every gang of engineers one of them must be specially told off to conduct and maintain the electric generating system, and this duty must not in any case fall upon the operators.

(d) *Voltmeter*.—The switchboard belonging to the electric generating system must include an absolutely reliable voltmeter and ammeter.

ART. 5.

Location of the Wireless Telegraph Station—Cabin.

(a) *Location*.—The wireless station must be installed whenever possible on the upper bridge, not too much towards the stern of the ship because the revolutions of the screw produce vibrations which hinder the reception of feeble signals. As far as possible a location shall be chosen free of smoke-stacks, chains, metallic fittings and, as far as possible, out of reach of the waves.

(b) *Cabin*.—This must be solid and well built, perfectly watertight and of a sufficient size to comfortably contain the apparatus, and to serve in case of need as quarters for the operators, besides being sufficiently sound-proof to allow of the reception of faint signals.

The motor alternator system of the sending station must be enclosed in a cupboard sufficiently sound-proof to prevent the noise made by its revolutions interfering with reception; the latter ought to be possible without involving any stoppage of the generating machine.

It is advisable to quarter the operating staff in the wireless cabin. This arrangement allows of the most rapid action in the case of mishap and consequently affords greater security.

If circumstances do not permit operators to have their bunks made up in the wireless cabin, choice shall be made for their location in a position as near as possible to the wireless station and on one of the upper decks.

The cabin must be fitted with an emergency lighting system independent of the ship's electric generating set, petrol lamps, candles, etc. The operator must always have ready to hand means for getting a light. A ship's lantern must be at the disposal of the operator in the wireless cabin, so that in case of need he may proceed during the night to overhaul the exterior apparatus.

Arrangements should be made that no light can, during the night, filter through to the outside, when the doors of the wireless cabin are opened. (Thick black curtains should be used or automatic light stoppers, operating as soon as the doors are opened.)

The wireless cabin shall be fitted with a ship's chronometer which must always show Greenwich mean time. (G.M.T.)

Easy and rapid access to the roof of the wireless cabin must be provided by an iron ladder so as to enable ready verification of antennæ connections, lead-in insulators, etc.

It has been observed that submarines when bombarding a vessel generally endeavour to destroy the wireless cabin at the first opportunity. These cabins are conspicuous on account of the outline formed by the insulators leading down from the antenna. It will be found an excellent precaution to hide these insulators by (e.g.) awnings which follow the contour of the cabin and overlap its roof.

(c) *Means of Communication.*—The operator must not leave the wireless cabin and abandon his listening-in, in order to receive a communication from the officer on watch, or in order to hand to him a message which he has received, or to ask for current, etc.

It is equally necessary that a third party shall not intervene in the transmission of these messages, such a course being always liable to lead to dangerous errors.

A telephone or speaking tube must therefore be erected between the wireless cabin and the bridge.

If the operators have their bunks fitted in a place apart from the wireless cabin, an electric bell shall be installed in their state room with a push in the wireless cabin, so as to give the radiotelegraphist on duty an opportunity of summoning his colleague.

If there be only a single operator, and if he sleeps in a separate cabin, an electric bell shall be installed in that cabin with a push on the bridge, so as to give the officer on watch means for calling the operator when the latter is not on duty.

All these means of communication must invariably be kept in perfect working order.

ART. 6.

Technical Conditions of Installation.

(a) *Erection and Fitting.*—The rapid execution of erection under present conditions must not interfere with the elementary precautions of assuring the efficient working of the wireless station and providing against risks of short-circuiting and fire.

The connections must also be carefully made by means of a flexible cable insulated by two layers of vulcanised rubber, the whole covered with lead, with an insulation resistance of at least 600 megohms per kilometre. This cable shall moreover be mechanically protected by a tube of iron or steel in every part where it is exposed to deteriorating influences.

A special line leading from the switchboard of the electric generating group shall furnish power to the wireless station. No other circuit must be connected up with this line except, in cases of emergency, a lighting circuit for the wireless cabin. Fuses must in this case be inserted in order to protect the lamp or lamps. A bi-polar interrupter and contact-breaker must be placed:

(a) In the machine-room, on the switchboard of the electric system in the special circuit serving the wireless station.

(b) Within the wireless station itself in the circuit carrying the continuous current.

(c) Within the wireless cabin in the alternating current circuit at the ends of the alternator.

In the case of the two contact-breakers placed in the continuous feed circuit, the one on the switchboard of the electric generating system, and the other in the wireless cabin, the former must be considerably stronger than the latter in order to avoid its replacement with fusible material when faulty manipulation (or some accident to the wireless instruments) results in the melting of the fuses in the wireless cabin.

The switchboard of the wireless station shall be fitted with the necessary measuring instruments for observing the working of the machines and the wireless apparatus.

Nevertheless, it is permissible to replace continuous and alternating current voltmeters on this switchboard by pilot lamps of appropriate voltage.

The continuous current voltmeter—or the pilot lamp which takes its place—must give the operator constant opportunity for assuring himself that the generator is in working order and that there is no interruption in the circuit which feeds the wireless station.

(b) *Machines—Low Frequency Circuit.*—These machines and this apparatus must be very carefully insulated between the windings and between the windings and the frame. They must be submitted to a test for dielectric strength under a continuous voltage of 1,000 volts applied for five minutes when cold.

(c) *High Tension Apparatus.*—The insulation must have and must preserve a high degree of efficiency. This apparatus must be able to stand the following test: The sending station must be operated with the antenna circuit disconnected, and with each terminal of the secondary of the transformer earthed in turn for a period of five minutes, together with its core and metallic casing. Both machines and instruments must be effectively protected against any excess of strain due to the high frequency circuits.

(d) *Accumulator Batteries.*—It is strictly forbidden to switch any circuit whatsoever—lighting, ventilating, etc., on to the accumulator batteries of the principal set, or on to the battery of the emergency set, or to transfer any units of the battery elsewhere; these must never be used, for instance, for lighting purposes during a temporary stoppage, etc.

The only allowable exception consists of the connecting on to the battery of the principal set—if such a source of supply be utilised for that set—a pilot lamp of 20 watts at the maximum which takes the place of a voltmeter. Any such lamp must be protected by a special double-pole fuse.

No pilot lamp may under any circumstances be fitted on the battery of the emergency set.

Operators are held personally responsible for any misuse of their batteries.

The batteries of accumulators must always be kept completely charged during the voyage. This complete charging must be effected before departure, and if necessity arises they must be re-charged every day, or every other day, according to the amount of use that has been made of them.

The accumulator switchboard must include :

(a) An ammeter showing the strength of the charging and discharging currents.

(b) A well-calibrated voltmeter connected to the terminals of the battery.

So far as the battery of the emergency set is concerned it is always permissible to omit the ammeter when the charging current is automatically limited to one or two values determined by the introduction of fixed resistances in the circuit.

Since the battery of the emergency set is very seldom at work care must be taken to ensure its maintenance in good order.

For this purpose a special apparatus must be provided for discharging the battery through a resistance.

This discharge shall be carried out at Ports of Call, and care must be taken immediately afterwards to re-charge the battery completely.

Steps shall be taken to make sure of the preservation in good order of the batteries during the periods when the ship's dynamo has stopped working.

(e) *Syntonsisation*.—Regulations against sending out signals in the larger number of allied ports and in certain neutral ports plainly renders difficult a proper tuning up of the ship's station after installation.

Nevertheless, it is easy to effect an approximate syntonsisation without infringing the above-mentioned regulations by simply exciting the aerial with the help of a suitable buzzer. It is, therefore, formally recommended that this buzzer tuning method shall be used after installation, preparatory to the operation being completed after the ship has left the port. The operator will be guided in these tests by the reading of his antenna ammeter.

This syntonsisation must be made for each of the two regular wavelengths (300 and 600 metres) and for each of the three antennæ, the regular, the single strand, and the emergency.

Tables clearly indicating the different tuning adjustments must be posted up in the cabin in clear view of the operator.

(f) *Plans of the Connections—Working Arrangements*.—Amongst the documents carried by the station, there must be included detailed plans of the connections of the installations and of all the apparatus, with the object of helping operators in looking for and rectifying any faults that may occur.

Radiotelegraphists must thoroughly understand the working of their station. They must practice themselves in establishing instantly, and without experimentalisation the necessary connections for bringing into action the emergency set, the emergency aerial, different wavelengths, etc.

ART. 7.

Operating Personnel.

(a) *Nationality*.—The Belgian Government established on the 4th May, 1917, the following regulations concerning the nationality of the operating staff:—

(i) The radiotelegraphic stations of Belgian ships must be served, in principle, by operators of Belgian nationality.

(2) In default of Belgian operators the owner of stations may, at their own responsibility and with the previous authorisation of the Belgian Government, have recourse to subjects of Allied nationality to the exclusion of neutral subjects, until they have been able, with as little delay as possible, to replace them by Belgian subjects.

(3) It is only quite exceptional that a neutral operator will, under any circumstances, be allowed to fill a post on board. A specific request must be made in advance, if need be by telegram, and the owner of the station must furnish detailed references. He will be held responsible for any acts that may be committed by this employé.

In any case, any such authorisation will be valid solely for a single trip.

Demands for emergency authorisation must, if need arise, be addressed to: The Administrator of Belgian State Telegraphs, Radiotelegraphic Service, 15, Place de l'Hôtel-de-Ville, Le Havre, France. The telegraphic address of which is: Service Radiotelegraphique Etat Belge, Le Havre.

(b) *Qualification*.—Every operator, whatever may be his nationality, in service on board Belgian ships must possess the Belgian Radiotelegraphic operating license of the first class, and have a good working knowledge of English.

(c) *Physical Qualifications*.—The special character of the service in times of war constitutes a complete bar against the employment of any operator not completely robust, or in full possession of all his limbs, or in *fine* anyone who is not physically perfect.

(d) *Disciplinary Measures*.—If an operator gives cause for any reasonable complaint on the part of the Belgian, or Allied Authorities, on the part of the owner of the ship, of the captain, of the owner of the station, etc., with regard to any misdemeanours committed in the course of the execution of his service, he may be disqualified, either temporarily or for the duration of the war, his license being suspended for the period of his disqualification. A notice thereof will be sent to the Minister of the Interior if the individual so affected proceeds to appeal. If he has been suspended without pay from his functions as Radiotelegraphist on board Belgian ships he will immediately be placed at the disposal of the military authorities.

Operators are, moreover, subject to the Disciplinary and Penal Code of the Mercantile Marine.

ART. 8.

Organisation of the Service.

(a) *Listening-in*.—During the whole length of the voyage listening-in must be completely continuous. This can only be assured by relays of two operators in watches of four hours on and four hours off. The operator on watch may not even temporarily quit his post in case of urgent need without having been replaced by his colleague not on duty. Nevertheless, if the supply of qualified operators belonging to Belgian, or Allied nations shall be temporarily insufficient, the owner of the ship may be exceptionally authorised to have the service carried on by a single operator. This latter must in that case so organise his listening-in as to receive all the war warnings which may affect the navigation of the ship, as well as radiotelegraphic time-signals at least once in the 24 hours.

Such an authorisation as this must be applied for to the Department of Railways, Marine, Posts and Telegraphs. The person so applying

must state the probable period which will elapse before he can recruit or train a second operator.

(b) *Carrying out of the Service.*—For the carrying out of the Radiotelegraphic Service operators are placed under the supreme authority of the commander of the vessel.

They are strictly forbidden to send out signals of any sort, or to answer a signal, even one of distress, without the authorisation or instructions of the officer on watch. They must never answer any station utilising the Telefunken System. No Allied vessel possesses a set of this type.

All transmission—obviously cases of distress excepted—must be made with the smallest amount of power compatible with the circumstances, so as to reduce as far as possible the zone in which the signals may be picked up by enemy sets, thus enabling them to determine the position of the ship.

All executive messages relating to navigation, as well as all distress signals, must be brought with all speed to the knowledge of the officer on watch *exactly as they stand*; the operator must never undertake to judge whether a message of this kind does, or does not, affect the navigation of his ship, the commander alone is the arbiter in such a matter.

Itinerary.—The operator on watch must make himself acquainted with the itinerary, the position and the course of the ship.

(c) *Duty in case of Distress.*—In the case of accident, explosion, etc., the operator, or operators, must immediately test their instruments to see if they are still in good working order. If the current of the ship's generator has failed they must switch on, without loss of time, the connections of the emergency set and test their antennæ. If the principal antenna be out of order, and if time presses, they must link up their gear with the emergency antenna, taking care to free it, whenever necessary, from all metal contact which may earth it, or from the principal antenna.

A trial with the auxiliary coil with direct excitation (plain aerial) will immediately inform the operator with regard to the quality and insulation of the antenna.

In a word, he must act in accordance with circumstances, so as to be able to send out his signal with the smallest possible delay; the gain of a few seconds may save the lives of all the passengers. It is only if the captain considers that sufficient time is available, and if the emergency antenna be not in sufficiently good order, that the operator may proceed to repair the principal antenna, switch on the single strand antenna, or even erect a make-shift antenna.

As soon as a set is ready to send, he must advise the captain and ask for orders, getting them *confirmed in writing*, and these orders must be followed exactly.

It is the paramount duty of the radiotelegraphist not to abandon his post so long as there is any possibility of sending or receiving; unless the commander has given him the order to do so in view of the imminent abandonment of the ship.

(d) At sea the operator must be ready at any moment to send out signals of distress with the smallest possible delay and with the maximum of energy and efficiency that the circumstances permit; he will make his arrangements accordingly. Thus for instance in the event of damage being done to the aboard-ship generator or to the principal set the emergency gear must be put into working operation.

No distress call may be radiated without the express order of the commander of the ship. It is absolutely necessary that the operator should remain collected at the critical moment of action, mishap or an attack. Upon him may depend the lives of all the passengers to say nothing of his own as well as the preservation of the ship and its freight.

He must never lose sight of the fact that it is useless to send out a distress signal without its being accompanied by the name of the ship in full and as exact an indication as possible of its position. The form of the distress call must follow strictly the instructions of the Naval Authorities in charge of all commercial ships.

Every positional error or change of position must also be radiated.

If an operator receives no answer to his distress calls he must repeat them with intervals of listening-in, and on each emission must recapitulate all the needful particulars. Should the operator conclude that his appeals are vain he should send out a new series of calls after having proceeded in the following manner. Considerably amplify the coupling between the primary oscillation circuit and that of the antenna so as to obtain an impure badly tuned and more damped emission, which stands the chance of affecting the reception of a larger number of stations and consequently of being picked up. It must be remembered, however, that the range of such an emission is less than that of a properly syntonised call. Recourse may also be had on occasions to the emergency gear with induction coil acting on a plain aerial.

Ship's Register.

(e) On every ship the operators should keep a register with numbered pages in which they will progressively enter the following particulars—showing the time in G.M.T. and the name of the operator on watch:—

(1) The start and finish of the watch of each operator as well as any interruptions, their duration and their cause.

(2) Any faults which may occur in the transmitting or reception gear, any lack of current, etc.

The nature and the cause of these mishaps must figure in the report, as well as the duration of the resulting interruption.

(3) The result of the periodic experiments conducted or some mention of the reason for which they have not been made.

(4) A record of all communications carried on with foreign stations and which did not affect their own ship.

It will suffice to make a simple record which will allow later on of these communications being reconstituted and identified. For example:—

17 h. 53 ABC de XYZ—27 mots code mqzr dvpv....

17 h. 56 XYZ demande repetition depuis hdpz, etc., etc.

(5) The complete text of all messages received regarding the navigation of the ship and communicated to the officer on watch.

(6) All distress calls picked up.

(7) The exact text of every message sent.

(8) If possible and if stations permit, in the case of accidents enter all details relative to the execution of the radiotelegraphic service (distress calls, replies, steps taken for safety, etc.).

An operator is forbidden to enter in the steamship register any translation into plain language of a coded text. His register must,

moreover, be verified and checked every day by the commander of the ship.

This register being by its nature essentially confidential must only be handed over to the Belgian and Allied authorities.

In the event of disaster operators must endeavour to save their ship's register, and if there be any risk of its falling into enemy hands they must throw it into the sea.

Account of Accident.

(f) In the event of its being necessary to abandon ship, or if the operator or operators are able to preserve their steamship register, they must address it to the Administration of Belgian Telegraphs at Havre through the intermediary of a Belgian Consul residing in the neighbourhood of the port at which they are disembarked. This register must not be sent by post. Whether the register has been sent or not, the operator (or operators) must in addition indite with as little delay as possible a report giving, with specific mention of dates and times, every detail relating to the execution of the radiotelegraphic service both before and after the accident (distress calls, life-saving procedure, etc.).

Mention must be made of what has happened to the ship's register, and if circumstances permit this report must be submitted by the operator, or operators, to the captain for his signature and he will make thereon any observations which he thinks fit. This document shall then be addressed by registered post to: l'Administration des Télégraphes belges Ministères belges, Le Havre (France).

Allocation of Operators.

(g) In the interest of the security of navigation it is well to maintain as far as possible the allocation of an operator to a specific ship or at all events to ships which ply under the same conditions, *i.e.*, between the same ports or countries.

Regard may be had for the purpose of this rule to temperaments in certain cases; for instance, it is advisable to consider the necessity of relieving operators navigating in tropic seas after long enforced idleness of a ship, or after illness, accident, leave, etc.

Confidential Character of Wireless Messages.

(h) Every operator must have taken the oath of observing the most absolute secrecy with regard to wireless communication under the penalty of Articles 149 and 150 of the Belgian Penal Code.

The attention of operators is expressly directed to the point that in time of war any detail relating to the radiotelegraphic service is of a character essentially confidential; every indication relative to the manner of framing and transmitting certain messages, to the presence of certain ships, to the routes followed, to convoys and their escorts, to distress calls, to sinking, etc., *in fine* everything which concerns navigation, must remain absolutely secret.

Every indiscretion coming to the ears of the enemy may have the most serious consequences.

The utmost discretion is therefore necessary, and more particularly in neutral countries and in the presence of neutral subjects—including amongst them their wireless men.

ART. 9.

Maintenance and Investigation.

Operators are responsible for the maintenance of radiotelegraphic installations. The

commander of the ship must accord them the help of the personnel on board necessary for the investigation and upkeep of antennæ apparatus, etc.

Every part of the radiotelegraphic installation must be constantly maintained in perfect order, special care being given where such parts are subject to high tension.

Periodic Tests.

(1) Twice a day, morning and evening, a test shall be carried out of the principal transmitting set and of the emergency set in local circuit; that is to say, the antenna being disconnected. This test (signals or continuous sending) shall last for the length of time which the operator judges necessary to make sure that all is in order.

(2) Every unnecessary message is forbidden on the high seas. In order to make certain of the satisfactory working of the station (including radiation and insulation of antennæ) opportunity shall be taken at the moment of starting the voyage for proceeding rapidly and at irregular intervals to the following emission tests.

Choice must be made of a time when the traffic between neighbouring stations is small and care must be taken not to choose the hours when war warnings are being issued. These tests shall be reduced in duration to the minimum. They shall proceed as follows:

(a) With the principal set on the principal antenna send out a call of a few seconds; the deviation of the amperemeter of the antenna will allow an operator to judge immediately if the installation be working well (it is unnecessary to keep up this sending until the needle of the apparatus becomes absolutely motionless).

(b) With the coil of the emergency set excite the principal antenna in plain aerial; a long white spark strong and crackling will indicate that the insulation of the antenna is good, the emission of short sending will suffice. (c) Make the same test to verify the insulation of the emergency set.

(3) Make a daily verification of the spare detector.

In case of any parts of a machine or apparatus being found to be out of order take steps to remedy this at once. Never leave it over for later on.

ART. 10.

Spare Material—Gear.

(a) *Spare Material.*—The Radiotelegraphic Station must contain the following material:—

(1) A complete transmitting condenser (primary circuit) of a fixed capacity and ready for service.

(2) An aerial lead-in insulator (or a spare tube).

(3) Antenna wire, insulators and accessories in sufficient quantity for the construction of a new main antenna.

(4) A telephone with double headgear and two leads.

(5) A galvanometer for the testing of circuits.

(6) Various wires and ropes.

(7) Various accessories and spare parts, etc.

(b) *Gear and Tools.*—The operators must have at their disposal an ample supply of tools, especially such as are necessary for soldering antennæ and apparatus; their tool chest must contain *inter alia* a hydrometer for verifying the density of the accumulator electrolyte, and a portable and accurate voltmeter graduated from zero to 3 or 4 volts in order to measure the individual cell voltages.

ART. II.

Special Arrangements.

On board ships coming under this category absolutely special precautions must be carried out.

The wireless cabin must *de rigueur* be located on the upper deck and built in such a way as to be distinct and airy; the insulation of the antennæ and of the metallic stays must, moreover, receive special attention.

Supplementary precautions may be imposed in accordance with circumstances.

ART. I2.

Various Arrangements.

Modifications to Installations.—Ship installations must not be modified without the previous assent of the Department of Railways, Marine Posts and Telegraphs.

Nevertheless, in case of partial (or total) incapacity for working, a new installation may be temporarily erected, provided that it conforms with the conditions imposed for the authorised station.

A new request for authorisation must be sent in without delay, wherein shall be set forth the necessity for having carried out any modification of the installations approved.

The licensee of a board-ship station (*i.e.*, the holder of an authorisation to instal, or of a sea-going radio license) is obliged at all times to follow the instructions given by the Department of Railways, Marine, Posts and Telegraphs, in whose control are vested all ships' stations, and to carry out within the specified times all modifications or additions which are judged necessary, not only with regard to installations and apparatus but also with regard to the manning, qualification and service of the operating personnel.

At need, the Department above mentioned shall carry out, or cause to be carried out, at the expense of the owner, all testing, repair, modification, or addition of which the execution is judged necessary to ensure good working of the installations or the safety of the ship, without any responsibility under this heading being incurred by the State.

Lifebelts.—The wireless cabin, whether or no it serves as the operators' state room, must contain for each of the radiotelegraphists a lifebelt of an efficient and approved type.

Other life-saving apparatus of the same character shall be at the disposal of operators in the places in which they are located if they do not sleep in the wireless cabin.

These life-saving appliances must be always kept in perfect order.

ART. I3.

Measures of Discipline and Control.—The officials of the Belgian Government duly appointed for that purpose have, at all times of the day or night, not only in Belgian territorial waters, but outside those waters, as well as on board Belgian vessels in foreign ports, free access to the installations of the authorised ship station and free disposal of the documents relating to the service of that station.

The owner (that is to say, the holder of an authorisation for installation or of a radiotelegraphic license) as well as his representative, employees, charterers, captains, officers, operators, masters and personnel are bound to facilitate by every means the work of supervision and control vested in these officials.

Under its controlling rights, the Department of Railways, Marine, Posts and Telegraphs may demand that the wireless register of the ship be forwarded to it.

Access to the Wireless Cabin.—Access to the wireless cabin is strictly forbidden to the personnel of the ship, except in such cases where access is necessary for the purposes of duty; and the same interdiction applies to any foreigner with the exception of the authorised naval authorities of Allied Powers.

In the absence of the radio officers, the cabin must be locked up after the windows have been closed on the inside, the key shall be handed to the commander of the ship or, in his absence, to the chief officer.

INFORMATION TO BE FURNISHED IN THE REQUESTS FOR AUTHORISATION APPERTAINING TO RADIOTELEGRAPHIC STATIONS.

ART. I4.

Applications to be sent, under registered cover, to the Minister of Belgian Railways, Marine, Posts and Telegraphs, at Sainte-Adresse, Seine-Inférieure, France.

(a) *Where a Ship is not already furnished with Wireless* :—

Application.—Social status, name, Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (steamer, sailing vessel, motor launch), net tonnage, speed, business, itinerary, whether carrying passengers regularly or occasionally; whether on occasion freighted with volatile and inflammable goods.

System of Apparatus.—What system of apparatus do you purpose installing on board your ship? Name and address of the supplier of the installation and apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Here give a description of the various parts and arrangements of the proposed installation, with plans or the connections and apparatus.

[N.B.—Descriptions and plans must be of such a character as to indicate whether the proposed installations conform to the prescribed conditions.]

The power available at the terminals of the wireless alternator (voltage and current); frequency of current.

Number of sparks per second.

Minimum range by day of the stations as estimated by the supplier.

Constitution of the emergency set.

Accumulator battery of the emergency set, number of cells, type, voltage, capacity, in ampere-hours.

Does the sending set include a battery of accumulators?

Number of cells, voltage capacity in ampere-hours.

Antennæ.—The form and approximate dimensions of the main antenna. How is it proposed to instal the emergency antenna? Where will it be fixed? Its shape and approximate dimensions.

Electric Generating System.—If an electric generating system exists on board, show what kind of motor it carries (steam, petrol, etc.).

Power, voltage, and method of excitation for the dynamo.

The power available for feeding the wireless station.

Where is this electric generating system located?

If it is necessary to instal a special electric generating system :—

Name and address of the firm which supply it.

A description and plan of the system, type of motor (steam, petrol, etc.).

Power, voltage and method of exciting the dynamo.

Erection of the Station.—Where is it planned to instal:—

(a) The wireless cabin (are you constructing a special cabin or are you adapting one already existing)? On what deck? In what place? (Here add a plan and elevation.)

(b) The accumulator battery.

(c) The electric generating system (if a separate system is necessary).

(d) Operators' quarters.

Operating Personnel.—What qualified persons have you available to work your station?

Time for Erection.—How long a period do your suppliers need for the delivery of the material and for installing it on board your vessel?

About what time and in what port will this installation be set up?

The Proposed Signalling Arrangements.—Call letters—normal range in nautical miles. Wireless system and the character of emission. Wavelengths. Nature of services. Hours of service.

Board-ship charges: per word in francs.

Board-ship charges: minimum per radiotelegram in francs.

(b) *Where a vessel is already furnished with a wireless station that requires modification or completion in conformity with the stipulations of the present regulation.*

Applicant.—Social status, name and Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (whether steamer, sailing boat or motor-launch), net tonnage, speed, nature of traffic, itinerary; whether it regularly or occasionally carries passengers; whether on occasion freighted with volatile and inflammable articles.

System of Apparatus.—What is the system of apparatus installed on board your ship? Name and address of the supplier and of the installer of this apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Add a description of the various parts and make-up of the existing installation with a plan of its connections and apparatus.

What are the modifications you propose introducing to put it in accord with the conditions of the present regulation?

[N.B.—Descriptions and plans must allow of its being seen whether the installation and proposed modifications are in conformity with the new conditions laid down.]

Power available at the terminals of the alternator (voltage and current); frequency of the current.

Number of sparks per second.

Minimum range by day of the existing station.

Is there an emergency set? What is its constitution?

The accumulator battery of the emergency set, the number of cells, type, voltage, and capacity in ampere-hours.

Does the principal set include an accumulator battery?

Number of cells, type, voltage, and capacity in ampere-hours.

Antenna.—Form and dimensions of the principal antenna.

How is it proposed to instal the emergency antenna?

Where will it be fixed? The form and approximate dimensions thereof.

Electric Generating System.—What sort of motor does it carry (steam, petrol, etc.)?

Power, voltage and method of exciting theynamo.

What is the power available for feeding the wireless installation?

Is the electric generating set installed to serve solely the wireless station? Or is it to supply the lighting of the ship, electric motor-pumps, ventilators, etc.?

Where is the electric generating system installed? On what deck?

Location of the Station.—Where is it proposed to instal:

(a) The wireless cabin: on what deck? at what point? (Include here diagrams in plan and elevation.)

(b) The accumulator battery of the emergency set, as well as that of the principal transmitting set (if it carries one)?

(c) Operators' quarters?

Operating Staff.—What qualified persons have you at your disposal for working the station?

If you have on board only a single Belgian operator, how soon can you arrange to have the station worked by a second Belgian radiotelegraphist, or provisionally by one of Allied nationality?

Time Occupied by the Modifications.—How long do you estimate your suppliers and workers will take in modifying and completing your installations to accord with the conditions of this new regulation?

About what date and in what port will these modifications probably be carried out?

F APPLICATION OF THE DECREE OF THE 10TH SEPTEMBER, 1918, RELATIVE TO SHIPS' LICENSES. CIRCULAR NO. 1.

The attention of shipowners is directed to the fact that in pursuance of Article V of the Decree of the 10th September, 1918, relating to shipping licenses, Belgian vessels of 1,500 tons or over must be fitted with a radiotelegraphic station for the transmission and reception of ether messages through the agency of a competent personnel. The erection of these stations, their constitution, their operation, their supervision, etc., are regulated by international agreements and by Belgian laws and regulations in matters of radiotelegraphy.

With as little delay as possible, and at latest before the 15th November, 1918, every owner of a vessel liable to the above-mentioned obligation must, in conformity with Article I of the Royal Decree of November, 1913, deposit under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs of the Belgian State, located at Sainte-Adresse, Seine Inferieure, France, a request for authorisation to instal a radiotelegraphic station.

ONE SEPARATE REQUEST MUST BE MADE FOR EACH VESSEL.

Directions with regard to the particulars necessary to be furnished in such requests for authorisation will be found at the close of the administrative regulations affecting wireless telegraphy, dated 15th October, 1918.

The Department of Railways, Marine, Posts and Telegraphs, having regard to national interests and to the arrangements concerning apparatus and operators, shall settle the order in which vessels shall be fitted with their radiotelegraphic station and shall assign to each one of them the date at which it shall be completely installed and in a perfect condition for working.

The attention of shipowners is specially directed to the conditions of Articles 1 and 2 of the Royal Decree of the 3rd November, 1919,

which will be very strictly enforced. The authorisation for making installations must be obtained before any measure can be taken by the interested parties with the object of initiating the work.

A radiotelegraphic license shall be granted to the owner of a vessel when the installations have been recognised as conforming to the conditions imposed. This license will be granted for one or several voyages, or for a certain fixed period. It will be cancelled if it be established at any moment that the installations have not been set up and worked in accordance with the conditions stipulated in the licence or in a later regulation.

The licensee (one who benefits under an authorisation for a wireless installation or of a radiotelegraphic license) shall be bound at all times to follow the instructions given him by the Department of Railways, Marine, Posts and Telegraphs, and must carry out within the specified period all modifications or additions which are judged necessary, both with regard to installations and apparatus, so far as concerns its material, and the qualification and service of the operating staff.

Whenever needful the above-mentioned Department shall initiate, or shall cause to be initiated, at the cost of the licensee, any verification, repair, modification or addition which may be judged necessary to ensure the satisfactory working of the installations or the security of the ship without involving any responsibility therefore on the part of the State.

Except with special permission previously obtained, board-ship stations must be worked by specialised operators of Belgian nationality.

Telegraph Administration.

No. 1665 R.

Dated at Havre, 21st October, 1918.

CIRCULAR LETTER TO SHIPOWNERS WHOSE VESSELS ARE ALREADY FITTED WITH A RADIOTELEGRAPHIC STATION.

GENTLEMEN.—Article V of the Decree of the 10th September, 1918, relating to ships' licenses makes the granting of these permits subject to certain conditions affecting the manning and conditioning of the ship.

The Circular No. 1 addressed to shipowners has brought to your notice that, in conformity with Article V above, every Belgian seagoing vessel above 1,500 tons net must be fitted with a radiotelegraphic station in charge of a competent staff.

You will have found annexed to the Circular in question the text of certain arrangements which regulate the erection, working and conduct of the stations.

The Decree shall come into force on the 15th October, 1918. A certain amount of delay will be allowed you for modifying the radiotelegraphic installations already in existence on board Belgian vessels and to complete the engagement of the operating staff in accordance with the stipulations of the Belgian administrative regulations with regard to radiotelegraphy under date of the 15th October, 1918.

On the expiry of these delays all wireless authorisations or licenses issued previously will expire and be cancelled.

Kindly forward with as little delay as possible and at latest by the 15th November, 1918, under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs, located at Sainte-Adresse, Seine Inférieure, France, a fresh request for authorisation with regard to radiotelegraphy. *A separate request must be made for each ship.*

Directions as to particulars you are required to furnish in your request for authorisation will be found at the close of the Administrative Regulations dated 15th October, 1918.

After examining your request I will let you know the length of time granted you for installing and working your present station under the rules newly imposed.

A fresh radiotelegraphic license will be granted to the ship as soon as we have verified that these conditions are fulfilled.

In order to guard against mistakes and loss of time, all correspondence relating to radiotelegraphic installations (requests for particulars, personnel, licenses, etc.) must be addressed directly to:

Service de Radiotélégraphie de l'Etat Belge
Administration des Télégraphes,
15, Place de l'Hôtel de Ville,
LE HAVRE (France);

and telegrams to:

Service Radiotélégraphique Etat Belge.
LE HAVRE (France).

Please acknowledge receipt of this letter.

Your obedient servant,
(Sgd.) Belgian Inspector-General of
Telegraphs for Minister of
Marine, Posts and Telegraphs.

MINISTERIAL DECREE REGARDING AMATEUR WIRELESS INSTALLATIONS.

THE MINISTER OF RAILWAY, MARINE, POSTS
AND TELEGRAPHS.

DECREES:

G The conditions regulating the establishment and the working of receiving wireless stations are fixed in accordance with the following:—

ART. 1.—Requests for authorisation must be addressed to the Director-General of Telegraphs and Telephones at Brussels.

The person making the request must indicate the precise place and functions of the proposed station and must furnish for approval a description of the apparatus.

The applicant must prove if such should be the case that he is of Belgian nationality.

ART. 2.—Authorisation is granted:—

(a) By the Director-General of Telegraphs and Telephones when the applicant be of Belgian nationality.

(b) By the Minister of Railways, Marine, Posts and Telegraphs to whom the request should be transmitted by the Director-General with his advice, if the applicant be a foreign subject.

ART. 3.—The station authorised will be utilised exclusively for reception of time and weather signals; the transmission of any other electrical signals is formally prohibited.

The use of amplifying valves is not allowed. However, the Administration of Telegraphs and Telephones may, in certain particular cases, which must be submitted for approval and after enquiry and examination of the reasons given by the applicant, grant an authorisation to use such apparatus under conditions to be determined by the Administration.

ART. 4.—Under the penalty of immediate withdrawal of the authorisation, the applicant must scrupulously observe, and cause others to so observe, the secrecy of any information which is not intended for public use.

The contents of radiotelegrams other than meteorological telegrams which will eventually be received by the Postal Authorities, must be neither written nor divulged to anyone outside the officials appointed by the Administration of Telegraphs and Telephones, or of the judicial authority. The withdrawal of the authorisation

as a result of a contravention of this Law, will be eventually carried out without prejudice to the applicant of any punishment provided for by Law.

ART. 5.—The applicant is forbidden to receive any payment or remuneration whatsoever for the reception of information by means of the station authorised.

ART. 6.—The Government reserves to itself the right to examine installations authorised. When necessary the applicant will grant to the duly commissioned delegates of the Government free access to the said installations, and will facilitate by every means in his power such examination by the delegates.

ART. 7.—The applicant alone is responsible for all consequences whatsoever, resulting from the present authorisation, not only from the point of view of mistakes which may be made, but also in regard to all matters connected with patent rights or of any other rights of a third party. The responsibility of the State is, and will remain, entirely separate in connection with the present authorisation.

ART. 8.—The applicant is held responsible for notifying the Director-General of Telegraphs and Telephones of all alterations which he proposes to make to his apparatus. This must not be changed without the previously obtained consent of the Administration of Telegraphs and Telephones.

This administration may, however, at any time, and for whatever cause, suspend or revoke the authorisations granted, without the payment of any indemnity whatsoever, or without giving any reason for such suspension or revocation.

This permission neither includes any privilege either for this particular authorisation or for any subsequent authorisation of the same nature.

It is not transferable without the express permission in writing of the Administration of Telegraphs and Telephones.

At the request of the Administration of Telegraphs and Telephones the applicant must immediately place his apparatus out of working order.

ART. 9.—The applicant must hold himself responsible for all expenses and charges whatsoever, occasioned by permission granted to him.

ART. 10.—The applicant will pay a fixed annual fee of 20 francs for every authorised receiving station.

The first payment will be made before obtaining the authorisation; it will cover the remainder of any year from the day of the authorisation to the following December 31st.

Subsequent fees will be paid during the month of January of each year. No refund will be made by the Treasury no matter for what reason the use of the apparatus previously authorised be discontinued.

This applies equally in the case of the station being discontinued by order of the Administration of Telegraphs and Telephones.

ART. 11.—Stamp Duties and subsequent Registration Fees will be charged to the applicant.

Done at Brussels, August 7th, 1920.

(Signed) P. POULLET,
The Minister.

H Extracts from Royal Decree of November 8th, 1920, relating to regulations for ships.

(a) Provisional license for radiotelegraphic operation on board ship.

Administration of Telegraphs and Telephones. Brussels, August 3rd, 1921
22, Rue de Berlaumont 22.

Radiotelegraphic and Radiotelephonic Service.

No. 2886/R.

Provisional license for radiotelegraphist operator on board ship.

The present provisional license for radiotelegraphist on board ship of the first class has been delivered to

M. born at the of Belgian nationality.

The recipient has been subjected to a practical examination in audible transmission and reception at a speed of 20 words per minute.

M. has taken the oath relative to the secrecy of radiotelegraphic correspondence prescribed by the international regulations.

THE PRESENT PROVISIONAL LICENSE IS ONLY VALID UNTIL DECEMBER 21ST, 1920, TWENTY-ONE AND LATER.

Made in duplicate at Brussels, the 1921.

The Engineer-in-Charge of the Radiotelegraphic and Radiotelephonic Service.
The Chief of Floating Stations.

Signature of holder of the license.

(b) Notice of authorisation.

Administration of Telegraphs and Telephones. Brussels, 192

No. M.

By your letter of the you have solicited the authorisation to establish a private wireless station for the purpose of at

I have the honour to inform you that the desired authorisation has been accorded you under the conditions of the ministerial law of August 7th, 1920, of which the text is sent to you herewith.

The annual tax of 20 francs must be settled by cheque or postal order to the order of the Central Telegraph Department, Brussels. This order can be paid at any post office (excepting agencies), or to any rural postman on rounds. It is recommended that the following should be written legibly on the order:—

1. The number of the account to which the order is payable.
2. The name of the sender.
3. The nature of the payment (tax for wireless station).

Yours faithfully,

The Director General.

BERMUDAS (THE)

(See also Map Section)

A BRITISH Colony with representative Government, consisting of a group of 360 small islands (about 20 inhabited) the Bermudas are 580 miles east of North Carolina and 677 distant from New York. They are noted for their climate and scenery and constitute a favourite winter resort for Americans. The area is a little under 20 square miles, with a population of 21,987.

ADMINISTRATION.

There are two wireless stations working in the Colony. Wireless telegraphy is administered under the following enactments:—

A—The Wireless Telegraph Act, 1903.**B—The Wireless Telegraph Act, 1909.****THE WIRELESS TELEGRAPH ACT, 1903.**

A From and after the passing of this Act it shall not be lawful for any person in these islands to transmit or receive messages across the seas (by an Act of 1910 this was amended by the addition of the words "or between places in these islands") by means of any wireless telegraph, or to instal, erect, construct, establish, or maintain in these islands any instrument, apparatus, or other thing for the purpose of transmitting or receiving such messages, unless such person shall hold a written license from the Governor authorising the same, and such license shall be in force and unrevoked; and any person who shall offend against the provisions of this enactment shall be liable, on summary conviction before any two justices, for a first offence to a penalty not exceeding £25, and for a second or subsequent offence to a penalty not exceeding £100.

2. Any license issued by the Governor under this Act may at any time be revoked by him by a written notice given to the person to whom such license was issued, or by the publication of such revocation in the *Gazette*, and after such revocation such person shall not be entitled to any privilege or protection by virtue of such license.

3. Any license under this Act may be issued subject to such conditions and restrictions as the Governor may from time to time consider desirable in the public interest.

4. If any Justice of the Peace shall be satisfied from the information on oath of any credible person that there is good reason to believe that any of the provisions of the first section of this Act have been or are being violated, he may issue a search-warrant to any constable or constables authorising and requiring him or them, with or without assistants, at any hour of the day or night to enter into, and go through and search, inspect and examine any premises where such violation is suspected to have been or to be committed for the purpose of ascertaining whether such violation has been or is being committed; and if, upon such search, any instrument, apparatus, or other thing apparently used, or capable of being used, for the purpose of transmitting or receiving messages across the sea by wireless telegraphy shall be found, it shall be lawful for such constable or constables to seize and carry away, or otherwise to secure the same; and if, upon a hearing before any two Justices of the Peace, they shall adjudge and determine that any such instrument, apparatus, or other

thing, has been used, or is capable of being used, for either of the purposes aforesaid, they may adjudge the same to be forfeited, and such forfeiture may be in addition to any penalty which may be imposed on any person under this Act in respect of such instrument, apparatus, or other thing.

5. Any instrument, apparatus, or other thing which shall be adjudged to be forfeited under the provisions of this Act shall be sold or otherwise disposed of in such manner as the Governor shall direct, and if sold the net proceeds of such sale shall be paid into the public treasury, after payment thereof of such reward, if any, as the Governor shall award to the informer, or to any constable or constables executing the search-warrant under which such articles were seized.

6. This Act shall continue in force until and throughout the last day of December, 1907. (*By the Wireless Telegraphy Act Continuing Act, 1907, the Act of 1903 is continued in force indefinitely.*)

THE WIRELESS TELEGRAPH ACT, 1909.

B The Governor having informed the Legislature that a despatch has been received from the Secretary of State for the Colonies drawing attention to the desirability of making Regulations as to the use of Wireless Telegraphy apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, is was deemed expedient to confer on the Governor in Council the power to make such Regulations as may be necessary for the purpose aforesaid, and the following Act came into force in March, 1909:—

1. It shall be lawful for the Governor in Council to make regulations as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, for preventing such apparatus being worked so as to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established or worked in these islands, or with the transmission of messages between any such station and ships at sea.

2. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whilst in the territorial

waters of these islands shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

3. Any regulations made under this Act may impose fines for any breach thereof not exceeding £20 for a single offence, and not

exceeding £5 a day for a continuing offence, and such fines shall be recoverable with costs in any Court of Summary Jurisdiction consisting of any two Justices of the Peace.

4. All regulations made under this Act shall become operative on the date of their publication in the *Gazette*, or on such later date as shall be fixed by the regulations for the purpose.

BHUTAN

(See also Map Section)

SITUATED in the Eastern Himalayas, the state of Bhutan lies between $26^{\circ} 45'$ and 28° N. latitude and between 89° and 92° E. longitude. It has an area of about 20,000 square miles and a population of about 250,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information regarding wireless in Bhutan.

BOLIVIA

(See also Map Section)

THIS State possesses no seaboard, and, therefore, no maritime stations. The total area of the Republic is reckoned at 514,155 square miles. Geographically it lies between latitude 8° and 23° S., its longitude extending from $57^{\circ} 30'$ to 73° W. The population is estimated at about 2,889,970. Lake Titicaca, a wonderful stretch of water, about 150 miles in length and breadth and 12,545 feet above the level of the sea, marks the boundary between Bolivia and Peru, and still forms an important means of communication between the countries, although the most direct means of transit consists of the railway between Arica (Peru) and La Paz, the capital of Bolivia.

The Government consists of a President, two Vice-Presidents and five Ministers of State.

CONTROL.

Wireless telegraphy forms at present a branch of the Posts and Telegraphs, which is administered by the State.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Abdon Saavedra ..	Minister of Government and Public Works	La Paz
Mr. R. Villalobos ..	Director-General of Posts and Telegraphs	La Paz
Mr. Humberto Asin ..	Chief of Radiotelegraphic Service	La Paz

ORGANISATION.

Bolivia entered the International Telegraphic Convention on June 1st, 1907, in the fourth category, and gave in its adherence to the International Radiotelegraphic Convention on October 29th, 1915.

At present the following stations are in operation: The station of Viacha, which owing to its proximity to the capital is the first or central station of the Republic. The power is 15 kilowatts, it has four masts of 80 metres each, the working range is 1,200 kilometres during the day, it communicates with the Peruvian stations of Lima and Cachendo, and with the Bolivian stations of Riberalta, Yacuiba, Trinidad, whilst its communications are received at all offices of the Republic. The apparatus was supplied by the Marconi Company, and the service was inaugurated on the 20th October, 1916.

The station of Riberalta, installed by the Marconi Company, has the same power, the same height and number of masts, etc., as that of Viacha, communicating with the Brazilian stations of Porto Velho, Sena Madureira, the

Peruvian stations of Yquitos and Cachendo, and the Bolivian stations of Viacha, Cobija, Trinidad, Villa Bella, Cachuela Esperanza and Guayaramerin; the station has been in operation since October, 1915.

The station of Yacuiba, also, is of the same type as the two previous ones. The work was commenced by engineers of the Marconi Company, and was concluded in August, 1915. Its service with foreign nations is with Asuncion (Paraguay), and it also communicates with Antofogasta (Chile), but its principal aim is to communicate with the stations known as the Pilcomayo stations, so named from their being situated on the banks of that river.

The other stations in order of importance are as follows: Trinidad, the power of which is 6 kilowatts, and system "Telefunken," has a mast 80 metres high, and communicates with the stations of Viacha and Riberalta. It was installed in 1919.

Cobija.—The service of this station was inaugurated on May 4th, 1919; it communicates with Riberalta and the Brazilian station of Xapury. Its power is 5 kilowatts, and it is fitted with a mast 80 metres high. The apparatus was supplied by the Marconi Company.

The stations of Cachuela Esperanza, Manoa, Villa Bella and Guayaramerin are of the "Telefunken" system. They have a range of 150 kilometres, their power is 4 kilowatts, and each of these stations has two masts twenty metres in height. They communicate between themselves and with Riberalta, and were opened in January, 1920.

The stations called the Pilcomayo stations are installed at the small military forts of Ballivian, D'Orbigny and Esteros. That of Ballivian is the first which was installed in the Republic, the date being February 21st, 1914. The system of the three stations is the "Telefunken," and their power is 0.6 (six-tenths of a kilowatt) in the primary, notwithstanding which they communicate perfectly at a distance of 380 kilometres, by day, although in that district there is 90 per cent. of high wood. The height of the masts is 20 metres each, there being two masts to each station.

At each of the 15 kilowatt stations, which intercommunicate, a chief has been appointed who supervises the personnel of the neighbouring stations of lesser power, for which it has been necessary to create three divisions, which have received the names of Northern, Central and Southern Radiotelegraph Zones. Included in the first are the stations of Cobija, Villa Bella, Cachuela Esperanza, Manoa and Guayaramerin, the chief of which stations is stationed at Riberalta; to the second zone, viz., the Central zone, belongs only Trinidad, having Viacha as its central station, and finally Yacuiba which is the chief station of the Southern zone, in which are included the stations of Ballivian, Fort D'Orbigny and Esteros. Frequently this last mentioned zone is called the Chaco zone.

A radiotelegraphic school was established during 1917 in La Paz, under the direction of Mr. Asin, the Superintendent of Radiotelegraphy. There are no wireless clubs or societies in the Republic.

ADMINISTRATION.

At present no special laws or regulations have been passed for the administration of wireless, but a Bill for that purpose is in course of being drafted.

BRAZIL

(See also Map Section)

THE great Republic of Brazil extends on both sides of the Equator. It stretches between $4^{\circ} 22' N.$ and $33^{\circ} 45' S.$ latitude, and lies within the limit of $34^{\circ} 40'$ and $73^{\circ} 15' W.$ longitude covering an area estimated at 3,275,510 square miles and has a population of 30,645,296. Originally a colony of "Britain's oldest ally," the most cordial relationship between Brazilians and British is traditional with both nations.

CONTROL.

The radiotelegraphic stations of the country are exclusively under the control of the Government, and their administration is regulated by the Minister of Public Works with respect to installations of a civil character, and by the Ministers of State for War and the Navy with respect to installations destined for national defence and the services of the military and naval forces.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Pires do Rio	Minister of Public Works	Ministerio da Viação
Dr. Antonio Nogueira Penido	Director-General of Telegraphs	Reparticao Geral dos Telegraphos.
Dr. Francisco Bhering ..	Sub-Director Technical Department	Do.
Dr. Veiga Miranda ..	Minister of Marine	Ministerio da Marinha
Admiral Max de Frontin ..	Chief Naval Staff	Do.
Capt. Tenente Mario do Barros Barreto	Chief Naval Radio Service	Do.
Dr. Pandia Calogeras ..	Minister of War	Ministerio da Guerra.
Lt. Aranha de Vasconcellos	Chief of Army Radio Service	Do.

ORGANISATION.

The radiotelegraph service of the Brazilian coast serves both the Navy and the National Telegraph. All radio stations are connected with the National Telegraph system for the purposes of radiotelegraphic traffic giving through services with the interior.

There are no direction finding stations, but time signals and meteorological bulletins are sent out from the Ilha do Governador Naval Radio Station.

There are no private, experimental or amateur wireless installations; all have been abolished by order of the Government. There are no wireless societies, clubs or publications. The only company manufacturing *wireless apparatus* in Brazil is the Campanhia Nacional de Comunicações sem Fio, Rio de Janeiro, which company also conducts a wireless school. The Telegraph Department have established an official School of Radiotelegraphy, which however will not be open for some time. Dr. Francisco Bhering, Sub-Director of the Telegraph Department and a professor of the Polytechnic Engineering School, has been appointed first Director. One of the salons has been given the name of Marconi, in honour of the great inventor. Another salon bears the name of Morse.

According to the latest information available (December 31st, 1919) the following constitute the number of stations at present working:—

LAND STATIONS.

Coast Stations	27
Stations for Internal Communication only ..	11
(There are no privately owned Land Stations.)	

SHIP STATIONS.

Naval vessels	30
Merchant vessels	119

ADMINISTRATION.

A Commission composed of members of the Civil, Naval, Military and Educational authorities are studying the Decree, No. 3,296 of July 10th, 1917, with a view to modifying it. No information is, however, at present available regarding either their findings or its relation to the existing Decree.

By decrees Numbers 14,712, of 7th March, and 14,950 of 17th August, 1921, the Brazilian Government has granted to the Companhia Radiotelegraphica Brasileira a concession for the installation and exploitation of high power stations for trans-oceanic communication. The text of these decrees is not available.

The following laws and regulations govern the administration of wireless in the Republic:—

A—Extract from Act relating to the Brazilian Merchant Service.

B—Extract from Law No. 2,719 of December 31st, 1912.

C—Law 2,738 of January 4th, 1913.

D—Decree No. 3,296 of July 10th, 1917.

ACT RELATING TO THE MERCHANT SERVICE.

A

The following Articles refer to Wireless Telegraphy:—

ART. 159.—Those boats must without exception be provided with radiotelegraphic apparatus, approved by the General Direction of Telegraphs, with the necessary power to allow of communication with the wireless stations in the zones in which they trade, when:

(a) they carry passengers and are employed in the coastal trade, of any description whatsoever, and have a registered tonnage of over 300 tons, and for those boats employed in river trade having a registered tonnage of over 500 tons.

(b) They are only employed in the coastal trade as cargo boats, but carry over 30 (thirty) souls all told.

ART. 160.—After the promulgation of this regulation, no ship shall be registered by any Port Authority if it has not complied with the regulations of the preceding Article, the license to navigate being refused to any ship which, within one year from the date of the promulgation of this regulation, shall not have fulfilled the depositions set forth herein.

LAW NO. 2,719.

DECEMBER 31ST, 1912.

B

The above Law fixes the Coast Tax at 6 francs for a telegram up to 10 words, and 60 centimes for each extra word.

Included in the rate is the transmission between a coast station and the telegraph stations to which the wireless station is directly joined up.

There is a land telegraph charge (*via* National lines) of 25 centimes a word without minimum on telegrams destined to telegraph stations which are not directly connected up with a coast station.

For telegrams exchanged between Brazilian coast stations and ships flying the Brazilian flag the ship tax has been fixed at 240 reis a word with a minimum of 10 words, the coast tax at 400 reis a word with a minimum of 10 words, and the land telegraph charge (if any) at 200 reis a word without a minimum.

LAW NO. 2,738.

JANUARY 4TH, 1913.

C

A new wireless district was created by the above Law, with a credit of 732 contos, to include the Acre, Amazonas, and Para wireless stations, and these stations have since been taken over by the Telegraph Department and opened to public traffic.

WIRELESS LAW NO. 3,296.

JULY 10TH, 1917.

D

The National Congress resolves:—

ART. 1.—The service of radiotelegraphs (telegraphs without wires) in the territories and territorial waters of Brazil is exclusively within the sphere of federal Government.

Sole Paragraph.—The service of radiotelegraphy comprises also radiotelephony (telephones without wires).

ART. 2.—The establishment and exploitation of radiotelegraph stations are within the sphere of the Ministry of Public Works, in respect to its application of a civil character and the Ministries of War and Marine in reference to its applications destined to national defence and to the service of the Army and Navy.

Sole Paragraph.—The three above-mentioned Ministries will enter into an agreement in respect to the localities in which must be established the stations necessary for commerce, for navigation and for the defence of the national territory.

ART. 3.—The Government may give permission to third parties, nationals, without monopoly whatsoever, to instal or work one or more high-power stations in suitable places on the littoral; under the terms of the International Regulations concerning wireless telegraphy and also the Brazilian regulations which are in force for the execution of the same service; for the exclusive purpose of establishing inter-oceanic and inter-territorial communications with corresponding stations in other countries.

Par. 1.—These stations must be linked with the National Telegraphs, by whose intermediary shall be collected and distributed the international radiotelegraphic service to and from Brazil in such a manner that the Government shall receive the terminal rate in force.

Par. 2.—The rights that are conferred and the disposals contained in this article may only be used by the Government after the conclusions adopted in respect to this subject by the International Pan-American Convention, which at the recent conference in Buenos Aires was arranged should be held at Washington in 1917.

ART. 4.—The States within the area of their territories which are not yet served by telegraphs with or without wires, and may wish to establish radiotelegraphic stations, shall interest the Department of Telegraphs to instal and work them, debiting the respective costs against such States, and for the purposes of the adjustment of the accounts shall be considered as mutual traffic administrations with the Department.

ART. 5.—The National shipping companies whose steamers have accommodation for more than 50 passengers and whose voyages are longer than 150 miles from the port of origin of its ships and the site of the registered office of the company must instal on board of such steamers a radiotelegraphic station with a minimum range of 100 nautical miles, which shall be worked by an operator who holds a certificate of fitness granted by competent authority. The installations on board shall be provided with emergency apparatus and battery which will permit a continuation of the service in case of the failure of supply of electrical energy by the generators that depend on the main installation.

ART. 6.—Foreign ships will be permitted within or without the territorial waters of Brazil to use the radiotelegraphic stations which they have mounted on board to correspond with the coastal stations erected by the Department of Ways and Public Works previously being authorised by the same Ministry or the Department to this end and subject to the prescriptions and regulations governing this service.

Paragraph.—Foreign warships will be licensed by the authority designated by the Minister for Marine.

ART. 7.—The establishment and working of the coastal radiotelegraphic stations and others of a civil character in the interior of the country will be entrusted to the Department of Telegraphs, to which will fall the duty also of the superintendence and carrying out of all the service of fiscalisation in relation to the employment of this kind of telegraph system by the State by national shipping companies whether by fixed or moving stations and the execution of administrative acts, the promulgation of the dates of openings, the range and the class of each station and the inauguration of proceedings relative to misdemeanours committed against this branch of the service.

Sole Paragraph.—The said Department shall create a special section to which shall be entrusted the management of the service, and also it shall form a school of radiotelegraphy and it shall have authority to contract within or without the country with a professional teacher to take charge of the said school. The only persons qualified or admissible for the personnel of the said radiotelegraphic stations shall be nationals, holders of a certificate of competency issued by the above school, or by other holders of diplomas, admitted to work in the country.

ART. 8.—All the radiotelegraphic stations that were established in Brazilian territory and on board of national ships and on board of foreign ships whilst they remain or navigate on the rivers or territorial waters of Brazil, and claim to establish communication with the national stations for this purpose authorised, must be subject to the rules and regulations of the interior and international services that may be in force.

ART. 9.—Radiotelegraphic correspondence is authorised between national mercantile ships and also between them and foreign ships that possess radiotelegraphic stations aboard as well as between the said ships and the Brazilian coast stations dependent upon the Ministry of Public Works.

ART. 10.—Whatever concession to persons for the establishment of a radiotelegraphic service or whatever authorisation given to use the respective apparatus installed on board foreign ships may be revoked if they do not comply with the rules and regulations or if the Ministries of Marine and War judge it necessary for the security of the country or its defence.

ART. 11.—When the civil or military Federal authorities dependants of the Ministries referred to in Art. 2 have to make scientific or technical experiments in radiotelegraphy they must give notice to the Ministries to which they depend, and when they make experiments on behalf of functionaries of other Ministries, then they must give notice to the Ministry of Ways and Works.

ART. 12.—No other besides the Federal authorities may make experiments or establish experimental radiotelegraphic stations without

previous permission of the Ministry of Ways and Public Works, who can give the same with the restrictions and cautions necessary for the security and interests of the State and the efficiency of the traffic of the official stations.

ART. 13.—All the rules and regulations of the Department-General of Telegraphs shall apply to the service of radiotelegraphy with reference to the secrecy to telegrams and as to damages caused to the stations or their material.

ART. 14.—The Government will proceed in the terms of the legislation in force against those who, without permission, exploit, whether publicly or clandestinely, a radiotelegraphic service, and in time of the disturbance of public order or external war these offences shall be classified and punished in the first case as an act of resistance to constituted authority and in the last case as an act of spying.

ART. 15.—Those coastal and interior radiotelegraphic stations which are dependencies of the Ministry of Ways and Public Works, and not reserved for special purposes, will be open for public correspondence.

Sole Paragraph.—No responsibility will be accepted by the radiotelegraphic service for errors of the service or faulty delivery of telegrams, in the terms of Art. 41 of the regulations revised in London.

ART. 16.—Any Brazilian radiotelegraphic station, whether civil or military, terrestrial or marine, will be obliged to give preferential attention to calls for succour that are received by them.

ART. 17.—In all radiotelegraphic stations the public service shall have preference to private service, save in cases of *force majeure* (accidents and calls for succour).

ART. 18.—Whatever be the object for which radiotelegraphy be established the respective services shall be organised in a form not to cause disturbance to other radiotelegraphic stations, and the respective Ministries shall in all cases adopt provisions and rules necessary to such end.

ART. 19.—Radiotelegrams proceeding from a ship which flies a flag of a non-adherent country to the regulations upon radiotelegraphs of the Convention of London as well as those addressed to ships of such countries shall be transmitted by Brazilian stations only in cases where the respective country has previously declared that it will conform to those rules and regulations in the adjustment of accounts.

ART. 20.—When the Ministries of Marine or War have to establish radiotelegraphic stations for special ends in strategic points and fortified places on land or sea, they will proceed in agreement with each other and with the Ministry of Ways and Public Works when choosing of the site and deciding upon the manner of carrying out the work, to the end that they shall not interfere with their mutual traffics.

These stations may be worked by telegraphists of the civil administration.

Whilst civil functionaries man the stations established in strategical or fortified places they shall be subject to military regime.

ART. 21.—All coastal radiotelegraph stations worked by the Department of General Telegraphs must receive and transmit meteorological observations, and there must be provided installations at one or more stations of the apparatus necessary to transmit time signals in the manner established by the Time Conference held in Paris in October, 1912.

Sole Paragraph.—The national ships provided with apparatus for wireless telegraphy and the foreign ships in the same condition can signal to the coast stations when they are within reach of them their observations about the weather, which will be communicated to the Meteorological Observatory of Rio de Janeiro, and to the ships, on the other hand, will be communicated the observations from that Observatory.

ART. 22.—To the radiotelegraphic service of Brazil are applicable the International Radiotelegraphic Convention held in London and the rules which may be laid down for the execution of the present law.

ART. 23.—The adjustment of accounts shall be made six-monthly between the Department General of Telegraphs and the agencies of the companies of national and foreign ships, and in their absence with the administrations to which those ships are attached in accordance with what is established by Art. XLII of the International Regulations (revised in London).

ART. 24.—The call letters of the stations on board the national war and merchant ships

will be distributed by the Department of General Telegraphs in accordance with the series of indicators reserved for Brazil by the Secretary of the International Union of Telegraphs of Berne.

ART. 25.—The radiotelegraphic stations in the interior of the country shall be established and worked by the Department of General Telegraphs, organising proper radiotelegraphic districts in regions where there are none, connecting them with the telegraphic service by means of wired lines and working with a parallel service of wired telegraphs.

ART. 26.—Annuling all whatsoever acts in this connection effected by the Government prior to the promulgation of the present law.

ART. 27.—It shall be the sphere of the Ministry of Ways and Public Works to make provision for the establishment and initiation of an international radiotelegraphic service and with the adjoining countries as well as the drawing up of the basis of a definite agreement and referendum to the National Congress.

ART. 28.—All previous acts to the contrary are revoked.

BRITISH EAST AFRICA

(See under KENYA COLONY and PROTECTORATE, ZANZIBAR and PEMBA.)

BRITISH GUIANA

(See also Map Section)

Including: Demerara.

THIS Colony, which includes the counties of Demerara, Essequibo, and Berbice, lies on the north-east coast of South America, and has a total area of 89,480 square miles, with a population of 297,691. The Government is administered by a Governor with a Court of Policy consisting of fifteen other members, seven official and eight elected.

CONTROL AND ORGANISATION.

Both the ownership and working of all radiotelegraphic stations are vested in the Government. Only one station is open for public correspondence with ships.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. G. Spain, M.Am.I.E.E., M.I.R.E.	Officer-in-Charge, British Guiana Wireless Department	Georgetown, British Guiana
E. Hobbs	Wireless Station Superintendent	"

ADMINISTRATION.

The administration of wireless telegraphy is carried out under the following regulations:—

A—The Telegraphic Ordinance, 1903.

B—Ordinance No. 7 of 1910.

A This Ordinance may be cited as "The Telegraph Ordinance, 1903."

2. In this Ordinance "telegraph" means an electric, galvanic, or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communication by means of electricity, galvanism or magnetism, whether the same be transmitted by means of wires or cables or without wires or cables.

3. The Governor-in-Council shall have the exclusive privilege of establishing, maintaining and working telegraphs between the Colony and places outside of the Colony.

Provided that the Governor-in-Council may grant a license on such conditions and in consideration of such payments as he thinks fit, to any person, company or body corporate, to establish, maintain or work a telegraph between the Colony and any place or places outside the Colony; and

Provided that nothing in this Ordinance shall apply to or in any way affect the rights already granted to the West India and Panama Telegraph Company, Limited, under any Ordinance or Ordinances passed before the Commencement of this Ordinance.

ORDINANCE No. 7 of 1910.

B 1. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony, except under and in accordance with a license granted in that behalf by the Governor-in-Council.

(2) A person shall not work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor-in-Council, and the Governor-in-Council may by any such regulations, impose penalties recoverable summarily for the breach of any such regulations, not exceeding fifty dollars for each offence, and may provide for the forfeiture on any such breach of any apparatus

for wireless telegraphy installed or worked on such ship.

(3) If any person establishes a wireless telegraph station without a license in that behalf, or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding fifty dollars, and on conviction on indictment, to a fine not exceeding five hundred dollars, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license.

(4) If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a license in that behalf or contrary to the provisions of the regulations made under sub-section two of this section, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Governor or the Postmaster-General and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

(5) The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided, That nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1910.

BRITISH HONDURAS

(See also Map Section)

THE Crown Colony of British Honduras lies in Central America within 18° 29' 5" to 15° 53' 55" N. latitude and 89° 9' 22" to 88° 10' W. longitude. It abuts on the Atlantic, and is bounded on the north by Yucatan (Mexico), on the west and south by Guatemala, and on the east by the Caribbean Sea. The total area is about 8,592 square miles, with a population of 45,317.

CONTROL.

The ownership and working of the one radiotelegraphic station is vested in the Government. It is open for continuous ship service and has been recently refitted with a 25 kW. arc transmitter, the intention being to bridge the Admiralty station at Jamaica. An experimental license has been granted to St. John's Roman Catholic College in Form 2 issued by H.B.M. Postmaster-General in 1905.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Gerald S. W. Smith ..	Colonial Postmaster ..	Belize.
Mr. James Owen Hall ..	Superintendent of Wireless Telegraphs ..	Do.

During the war no privately owned apparatus was allowed in the colony, but laws are being prepared for the regulation thereof in accordance with the London Convention of 1912.

ADMINISTRATION.

Wireless telegraphy in British Honduras is regulated by Chapter CXCIX of the Consolidated Laws of British Honduras (revised edition), the text of which will be found below.

A—Consolidated Law.

B—Schedule.

C—License to use Wireless Telegraphy for Experimental Purposes.

CHAPTER CXCIX OF THE CONSOLIDATED LAWS OF BRITISH HONDURAS (REVISED EDITION).

TO REGULATE WIRELESS TELEGRAPHY.

A 1. *Interpretation.*—In this chapter "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *License to Install, &c., Wireless Telegraphic Apparatus.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus not to be worked on merchant ships except in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this chapter.

4. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purpose of this chapter, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this chapter.

(2) The regulations in the schedule to this chapter shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrants.*—If a District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship contrary to the provisions of this chapter or of any regulations made under this chapter, or of any license granted under this chapter, he may grant a search warrant to any police officer or any person appointed in that behalf by the Superintendent of Police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalty for contravention of chapter.*—(1) Any person who shall offend against any provision of this chapter or any regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding two hundred and fifty dollars, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) *Procedure.*—Proceedings shall be taken before the District Commissioner for the Belize District on the complaint of the Superintendent of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE—Section 4 (2).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

ii. In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His

Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

EXPERIMENTAL FORM 2.

Dated

LICENSE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES.

C This Indenture made the day of One thousand nine hundred and between the Colonial Secretary of the Colony of British Honduras on behalf of the Government of British Honduras of the one part and (hereinafter called "the licensee") of the other part.

Whereas the licensee is desirous of establishing installing and working an amateur wireless telegraph apparatus for demonstration purposes with the sole object of giving instruction in the Science Classes of Saint John's College;

And whereas by reason of the provisions of Chapter 199 of the Consolidated Laws (Revised Edition) it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place except under and in accordance with a license granted in that behalf by the Governor and it is also unlawful save as in the said Law provided to transmit wireless telegrams within the Colony;

And whereas at the request of the licensee the Governor has agreed to grant to the licensee the license powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing;

Now this Indenture witnesseth that in consideration of the premises and of the matters hereinafter appearing it is hereby agreed and declared between and by the parties hereto and the licensee (as to the covenants and agreements hereinafter contained on his part) doth hereby covenant and agree with the Colonial Secretary and the Colonial Secretary (as to the covenants and agreements hereinafter contained on his part) in exercise of all powers and authorities enabling him in this behalf doth hereby covenant and agree with the licensee in manner following (that is to say):—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in Chapter 199 of the Consolidated Laws (Revised Edition).

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

2. Subject to the provisions of this Indenture the licensee shall during the term or period commencing on the and terminating on the have license and permission from the Colonial Secretary—

to establish install and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule.

3. The licensed apparatus shall not be used by the licensee or by any person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

4. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony or the territorial waters abutting on the coasts thereof and in particular with the transmission or receipt of any messages between or at any wireless telegraph station established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

5.* (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at the station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall if so required in writing by the Colonial Secretary cease to use the licensed apparatus.

(4) If the Colonial Secretary is of opinion that the working of the licensed apparatus at the station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

* This clause will be omitted in the case of inland installations.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this indenture.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by the Government of the Colony.

7. The Colonial Secretary and his engineers and agents may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the Colonial Secretary the right for the purpose aforesaid of entry from time to time into and on such station and premises as may be in the possession or occupation of any person or persons other than the licensee.

8. All apparatus used or intended to be used under this license shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Colony.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by Wireless Telegraphy it shall be lawful for the Governor by warrant under his hand to direct and cause the licensed apparatus to be taken possession of in the name and on behalf of His Majesty.

10. The Colonial Secretary may at any time with the Governor's approval give notice in

writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may by writing revoke and determine these presents and the license powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said license powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Any notice request or consent (whether expressed to be in writing or not) to be given by the Colonial Secretary under these presents may be served by sending the same by registered post letter to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Colonial Secretary.

Signed on behalf of the Government of British Honduras

Colonial Secretary.

Witness.

Signed by the licensee on behalf of

Belize, British Honduras.

Licensee.

Witness.

THE SCHEDULE BEFORE REFERRED TO :—

CHARACTER OF APPARATUS.

Name of Station.	Maximum Range of Signalling with the Licensee's Own Apparatus.	Power (Current and Voltage).	Source of Power.
(1)	(2) miles	(3) Current and Voltage ..	(4) Batteries

BRITISH INDIA

(See also Map Section)

Including :

Baluchistan, Sikkim, Andaman and Nicobar Islands, Laccadive Islands.

GREAT BRITAIN'S connection with India followed on that of the Portuguese, Dutch, and French in the fifteenth, sixteenth, and seventeenth centuries respectively. The London East India Company, formed to concentrate in a single corporation the isolated British trading efforts in the Far East, was incorporated under Royal Charter by Queen Elizabeth on December 31st, 1600.

The famous Indian mutiny in 1857 brought a realisation of the fact that a commercial company is not suited for administering an Empire, and in 1858 Queen Victoria assumed "the Government of the territories in India,"

In 1877 the British Queen adopted the title of "Empress of India," and at present the name "British India" covers all territories governed by the King-Emperor through the Viceroy of India, or through any officer subordinate to him; whilst "India" means "British India," together with any territories of any native prince of chief under the suzerainty of His Majesty, exercised through the Governor-General of India or any officer subordinate to him (Act 52 & 53 Vict., C. 63, S. 18).

Continental India (including Baluchistan) stretches between 8° 0' and 37° 0' N. latitude, and lies in 61° 0' to 101° 0' E. longitude. Delhi, the new capital, is in 77° 0' E. longitude. The total area covers 1,802,629 square miles, with a population of over 319,075,132.

CONTROL.

The control of radiotelegraphy in India is vested in the Director-General of Posts and Telegraphs. With the exception of portable or semi-portable stations worked by the Military or Royal Air Force, all wireless stations in British India are either worked by or under license from the Director-General or by Local Governments. Similar methods of control are being proposed for the States in India, though at present none of these possess wireless apparatus. This will not be the case, however, in the very near future.

The Indian Wireless Board was formed in 1920 to co-ordinate all radio requirements in British India.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. R. Clarke, C.S.I., O.B.E., M.L.A., I.C.S.	Director-General of Posts and Telegraphs ..	Simla
Commander R. L. Nicholson, D.S.O., late R.N.	Director of Wireless Telegraphs	Simla
Mr. P. J. Edmunds	Divisional Engineer, Wireless (Research) ..	Karachi
Mr. N. H. Swinstead	Divisional Engineer, Wireless (Traffic) ..	Simla
Mr. P. Ryan	Divisional Engineer Wireless (Engineering) ..	Karachi
Mr. R. N. Hawes	Divisional Engineer Wireless (Instruction) ..	Karachi
Mr. S. W. Longhurst	Assistant Divisional Engineer, Wireless ..	Simla
	Assistant Divisional Engineer, Wireless ..	Karachi

ORGANISATION.

The general organisation of radio stations and their intended development is set out in the following Memorandum:—

MEMORANDUM.

DEVELOPMENT OF WIRELESS COMMUNICATION IN BRITISH INDIA.

Note (1).—This Memorandum has received the sanction of the Government of India.

Note (2).—It does NOT include wireless communication with the United Kingdom and other parts of the world, but the policy outlined will fit in with the scheme of Imperial Wireless Communications approved by the Imperial Government.

I.—DEFINITIONS.

Coast Station.—A station whose primary function is communication with ships at sea.

Inland Station.—A station whose primary function is communication with other land stations.

II.—GENERAL.

Government of India have the exclusive privilege of erecting, maintaining and working wireless telegraphs in British India and exercise this right by maintaining stations open for public correspondence and by granting licenses to private individuals to erect and work wireless

telegraphs in British India and in ships and aircraft registered in British India.

2. Besides a number of portable and semi-fixed stations of small power which are employed as temporary stations where and when required and the stations in Sandheads Pilot Vessels, the Government of India maintain the following permanent stations:—

(a) *Coast Stations.*—Bombay, Calcutta, Diamond Island, Karachi, Madras, Port Blair, Rangoon, Victoria Point.

(b) *Inland Stations.*—Allahabad, Delhi, Lahore, Maymyo, Mhow, Nagpur, Peshawar, Quetta, Secunderabad, Jutogh, Patna, Poona.

III.—COAST STATIONS.

3. At present about half the daily programme of these stations has to be given over to communication with Inland stations. At the large ports and important cities, a programme so divided neither fulfils the requirements of the ship traffic nor provides anything approaching the necessary service required by the Inland organisation. It is therefore necessary to have

separate stations at such places, and it is intended to provide separate Inland and Coast stations at the following ports:—

Rangoon, Bombay, Calcutta, Madras, Karachi.

4. Work has commenced at Rangoon and Madras which when completed, will provide each of these ports with a Coast station working entirely with ships and also with an adequate Inland station which will work entirely with other such stations.

IV.—INLAND STATIONS.

5. (a) The Inland stations together with the Coast stations (during the times the latter are not working with ships) form the nucleus of an organised wireless service, which provides facilities for Government, public and press traffic at the Inland Telegraph rates between these places. This may be termed the "Inland System."

(b) The functions of the Inland system are to supplement land lines, relieve congestion thereon and provide an alternative for the same in case of interruption. At present no Inland stations are erected to connect places between which no land line exists but there is no reason why this should not be done, if required.

(c) If the functions are to be performed and the system run on a commercial basis, stations must be equipped so that they are on an equality with land lines as regards speed of working and accessibility. Further, they must be fully used in normal times, so as to be kept efficient for service in emergency.

(d) At present the service is limited owing to:—

- (i) Low speed of working;
- (ii) Telegraph lines being generally capable of carrying the normal traffic;
- (iii) Stations being situated at a distance from the telegraph office, necessitating considerable rehandling of messages sent by wireless.

(e) It is intended to overcome these limitations by fitting high-speed apparatus and arranging that the stations are operated from the telegraph offices. It is also intended to fit all Inland stations with continuous wave apparatus.

V.—FEEDER STATIONS.

6. It will be seen, therefore, that apart from its temporary limitations the Inland system's facilities are restricted to the principal ports, cities and centres of India. In order to extend these facilities and feed and distribute from the Inland system in localities where such extension is necessary and to provide alternative routes for traffic, it is proposed to permit the installation of groups of small stations working as units.

7. Such a unit may consist of any number of stations termed "*Feeder Stations*," whose power, range, etc., will depend on the local requirements.

8. If it is required that a particular group of Feeder stations shall be linked to the Inland system, one station in the group must be close to the Inland station of the locality. This is termed the "*Main Feeder Station*" of the group.

9. If such linking is not required, no Main Feeder station is necessary.

10. If, however, such linking is required, but there is no Inland station in the locality, it may be provided by one of the following methods:—

(a) The erection of a Main Feeder station close to the nearest Inland station, making the necessary arrangements with the Local

Government in whose locality such Inland station stands; or

(b) Arranging to use a Main Feeder station belonging to another Local Government if such is practicable.

11. *Not to work with Inland Stations.*—In no circumstances can a Feeder station work direct with an Inland station. It therefore follows that the type of installation required for Feeder stations is independent of the type of the Inland stations. They may be large, small, fixed, semi-fixed or portable; generally they will use telegraphy but may be fitted for telephony also, or telephony alone, according to local requirements and conditions.

12. *Communication with other localities.*—Normally this will be via the Inland system, but arrangements can be made in special cases to permit inter-communication between Feeder groups of different localities.

13. *General organisation.*—It is intended to develop the organisation on the following lines:—

(a) Government of India will be entirely responsible for the development and working of Inland stations.

(b) Local Governments may decide their requirements as to the necessity or otherwise of establishing Feeder stations for the purpose of promoting internal security and retain complete control as to their sites, numbers, hours and class of service, etc., subject to the sanction of the Government of India.

(c) Before deciding on the establishment of any Feeder station, Local Governments should consult the military authorities regarding the location and the actual site of the stations and give full consideration to their views. (This does not apply to military sets which are part of the equipment of the Army; they will normally not be part of the Feeder organisation.)

(d) Government of India will advise as to types most suitable for Feeder stations in any locality and are prepared to obtain, erect, maintain and work the Feeder stations on behalf of the Local Government in accordance with the local requirements, provided the local authorities undertake to acquire and maintain the sites and erect the necessary buildings and meet the initial and recurring costs, which will include charges on account of supervision and inspection.

(e) Licenses will not be required for Feeder stations erected by Local Governments.

(f) The Government of India reserve to themselves the liberty to take over the system of Feeder stations in any locality on payment of the then value of the buildings and plant.

14. *Personnel.*—(a) The supervising and operating staff will normally be civil, but military personnel may be employed if the Local Government so decide. If civil, this staff may be recruited from General Service Telegraphists or locally according to the requirements of the Local Government.

In any case, this staff must be trained by and entirely under the Department of Posts and Telegraphs, and their costs will be included in the total cost of maintaining and working the stations.

(b) Menial staff (engine-drivers, peons, etc.) will be recruited locally, and may be paid by the Local Government or the Department of Posts and Telegraphs as may be most convenient. In the latter case, the Local Government will be debited with the cost.

15. *Apparatus and Plant.*—(a) The Local Government having indicated its requirements, the Department of Posts and Telegraphs will specify, order, obtain and erect the necessary apparatus, subject to the concurrence of the Local Government, the latter meeting the cost thereof which will include the necessary overhead charges.

(b) It is essential that the Department of Posts and Telegraphs should superintend the actual erection and installation of the apparatus, since they will have to look after it subsequently, and the importance of correct first fitting cannot be over-estimated; further, it is easier for the Wireless Engineering Branch efficiently to maintain machinery if they have erected it in the first place, than if they take over running machinery erected by another authority.

16. *Buildings.*—The Department of Posts and Telegraphs can specify the buildings required for any particular set and give approximate estimates, but they must be erected by the Local Government.

17. *Revenue.*—(a) Unless high-speed gear is fitted in the Feeder and Main Feeder stations (which, although not difficult, will in most cases be unnecessary owing to the comparatively small amount of traffic), it must be understood that these stations are more of an insurance against interruption and congestion upon land-lines than a commercial enterprise.

(b) In the first place Government of India propose that the following should be the general arrangement as regards revenue:—

(i) Except as provided in (iii) below, all messages sent by wireless shall be booked at the telegraph office. Nothing shall be handed in direct to the wireless station unless special instructions to that effect are given;

(ii) Subject to such limitations as the Government of India may from time to time impose, a Local Government shall be permitted to utilise its Feeder stations for the transmission of State traffic pertaining to it and within the limits of the province free of payment to the Central Government.

(iii) If desired, arrangements can be made for local State traffic as mentioned in (ii) to be handed in direct to the wireless stations;

(iv) In the event of interruption or congestion of traffic on the land-lines, public or commercial traffic may be transferred by arrangement between the Postmaster-General and the Local Government to a Feeder station for transmission. In such case the collecting rate shall be divided between the Department of Posts and Telegraphs and the Local Government on terms which will be announced from time to time.

(v) In cases of emergency the Local Government shall have complete power to decide the communication which shall be maintained between the stations, the class of traffic that shall be carried and every other matter concerning the working of the Feeder stations in the locality. Provided always that the Department of Posts and Telegraphs is kept aware of the arrangements made.

(vi) In all cases the Local Government shall have the power to decide the priority of traffic.

18. *Operating, Supervision and Upkeep.*—

a) The Department of Posts and Telegraphs will be entirely responsible for training the supervising and operating staff, and will also be responsible that suitable and sufficient supervisors are placed in charge of stations or groups of stations.

(b) The Department of Posts and Telegraphs will also be responsible for advising the Local Government as to steps to be taken for the upkeep and improvement of stations, and are prepared to put into execution such orders as the Local Government may issue, provided that if such orders entail expenditure, the Local Government shall find the money.

(c) The Department of Posts and Telegraphs will also arrange for periodical inspections of the stations.

(d) The administration of the stations will be in the hands of the Divisional Engineer, Wireless Engineering Division, and the local Postmaster-General as is the case with Inland stations.

19. *Communications between the Local Government and Post and Telegraph Department.*—

(a) On general questions communications should be direct between the Local Government and the Director-General of Posts and Telegraphs.

(b) On purely technical questions it is desirable that the senior wireless officer in charge of the stations of the locality should be general adviser to the Local Government, and that all correspondence should be referred to him for remarks before being forwarded to the Director-General of Posts and Telegraphs.

(c) The Divisional Engineer, Wireless Engineering Division, should be allowed to correspond direct with the wireless officers in charge of stations on matters concerning the technical administration of such stations.

(d) The Director-General of Posts and Telegraphs or his representative should have free access to any of the stations at all times.

VI.—LICENSED STATIONS.

20. Licenses to import, erect, maintain and work wireless telegraphs in British India may be granted to persons approved by the Government of India. These licenses will embrace the following types of stations:—

(a) Non-commercial stations, which are those erected for experimental, instructional and research purposes and by amateurs.

(b) Limited commercial stations, which are those erected to provide wireless facilities for the purpose of business or private communications, which facilities the Government of India are unable or unwilling to provide. Licenses for these stations will be given on the understanding that the Government of India or Local Government shall be at liberty to take over the station at any time on a 12 months' notice and on payment of such valuation of the buildings and plant as may be agreed between the parties, subject to reference to arbitration in the case of failure of agreement.

21. Licenses will be issued to approved applicants on behalf of the Governor-General in Council by the Telegraph Authority (Director-General of Posts and Telegraphs) subject to the concurrence of the Local Government concerned. Applications for licenses should normally be forwarded through the Local Government, and in all cases will be referred to the Local Government for remarks and concurrence before the license is issued.

22. Licensed stations will be of small power and may be used for private communications, research, experiment or instruction. They may be either telegraph or telephone sets.

23. The licenses provide, *inter alia*, for:—

(i) The protection from interference with Government of India, Local Government and other licensed stations;

(ii) Government of India to take them over in times of emergency;

(iii) Inspection by Government of India.

24. Licensed stations will be entirely controlled by the Department of Posts and Telegraphs (Wireless Branch) subject to such consultation with and reference to the Local Government concerned as may be necessary.

VII.—TYPES OF FEEDER STATIONS AND ESTIMATES.

25. *Tables I and II.*—Tables I and II show details of the types of wireless sets suitable for Feeder stations, together with estimates of cost.

26. In calculating actual cost many local factors have to be taken into consideration, but the amounts shown are round figures extracted from a detailed scheme worked out for the installation of a group of ten Feeder stations for the United Provinces.

27. The cost of a Feeder station may be divided into the following items, which again may be conveniently sub-divided as shown:—

(a) First cost—

(i) Apparatus and plant;

(ii) Buildings;

(iii) Land;

(b) Annual recurring charges—

(iv) Maintenance;

(v) Staff.

The principal factors governing the above items may be considered in some detail.

28. *Apparatus and plant.*—The apparatus and plant selected depends on the requirements of the locality as regards:—

(a) *Wireless power required.*—This is practically governed by the "Range," *i.e.*, the distance over which reliable day and night communication is required. The ranges shown may be taken as thoroughly reliable under all conditions, except during the periods of atmospheric disturbance from April to September, which periods seldom exceed 10 hours in any one day. In common with all forms of telegraphic communication, wireless suffers interruptions from the elements of nature, being affected by electrical disturbances in the atmosphere. The effects of these disturbances can be overcome by using transmitting sets of such high power that very severe atmospheric disturbances do not prevent reception of signals at the receiving stations. The cost of such an arrangement would be prohibitive in most cases. India is subject to very severe atmospherics for approximately 10 hours a day from April to September. During the remainder of the year, atmospherics are either non-existent or very slight.

Note—There is every reason to believe that the atmospheric difficulty will not long continue to be so serious.

(b) *Degree of reliability of power supply.*—This depends entirely on the proposed functions of the station and may be expressed as follows:—

(i) "Self contained," *i.e.*, the station generates its own power and is quite independent of any external source of supply.

(ii) "Partially dependant," *i.e.*, the station normally obtains power from an external source, but is fitted with a stand-by generating set.

(iii) "Entirely dependant," *i.e.*, the station has no power other than that supplied from an external source.

(c) *Service to be maintained.*—This embraces the number of hours per day it is desired to work the stations; whether communication shall be direct with all or any of the other stations in the group or through intermediate stations; and in the near future will include the question of fitting high-speed transmission and reception or otherwise.

Note.—At present hand-speed working an average of 18-20 words per minute may be assumed.

29. It will be noted that (a), (b) and (c) above are related as regards the staff required, which factor in turn reflects on the size or number of quarters for the same.

30. The service also affects the annual recurring charge as regards the item "Maintenance."

31. *Buildings.*—The buildings required may be divided into those required to accommodate the:—

(a) Apparatus and Plant, called "The Station";

(b) Staff, referred to as "Quarters."

32. *The Station.*—The buildings required for the station are generally of the same type for all sets mentioned in the tables. The rough minimum dimensions are as follows:—

(a) One room, 9' × 12' × 10' high;

(b) " " 6' × 12' × 7' high;

(c) " " 9' × 6' × 7' high;

(d) One petrol and oil store, 4' × 4'.

In the small station (100-120 watts) the room at (c) is not required.

In all cases the verandahs and roofs, etc., must be in accordance with the requirements of the locality.

33. The estimates under this head are a very rough approximation for new buildings fulfilling the minimum requirements. Where buildings already exist which are or can be made suitable, there will be a very considerable saving in cost. Other considerations being equal, this should be borne in mind when selecting the site of the station.

34. *Quarters.*—The number of staff, which again depends on the service to be maintained, affects the number of quarters.

In this case existing buildings should be made use of, if possible, and a considerable saving will be effected.

35. In any case if free quarters are provided they must be very handy to the station, otherwise it will be necessary to increase the staff to carry out the service. The service cannot be expected to be efficient, or the station properly looked after, if the staff have to travel some distance backwards and forwards to their work.

36. If free quarters are not provided, house rent allowance (H. R. A.) must be granted in lieu. This makes a very considerable saving on the first cost, but slightly increases the annual recurring charges.

37. The question must be settled locally, but it may be remarked that the provision of free quarters enormously increases the efficiency of the station and reduces the administrative difficulties in connection with accommodation for staff, which is otherwise an ever-recurring source of anxiety.

38. *Sites.*—The requirements of a suitable site for a station are practically the same for all the sets mentioned in the tables, *viz.*:—

(a) A fairly level plot about 150 × 50 yards, clear of trees and high buildings.

TABLE I.—First Cost.

APPARATUS AND PLANT.				BUILDINGS.		TOTALS:				
Type of Wireless Telegraph Set.	Power supply required.	Range in miles.	(i). Completely self-contained power.	(ii). External power and stand-by generating set.	(iii). Entirely dependent on external power.	Station.	Quarters.	With new buildings for station and quarters.	With new buildings for station quarters available or not provided.	With new buildings for quarters (if provided); station available.
						Accommodation for A. and P.	Foundations, anchorages, etc., office furniture.			
1½ kW. Continuous Wave ..	5-6 kW.	375	34,000	26,000	21,000	3,700	420	{ (i) 50,420 (ii) 42,420 (iii) 37,420 }	{ 38,120 30,120 25,120 }	{ 46,720 38,720 33,720 }
½ kW. Continuous Wave ..	2 kW.	150	21,050	20,000	15,000	2,520	340	{ (i) 36,310 (ii) 35,260 (iii) 30,260 }	{ 24,010 22,960 17,960 }	{ 33,690 32,640 27,640 }
100-120 Watt Continuous Wave ..	600Watts	75	13,200	13,200	10,500	1,640	340	{ (i) 27,480 (ii) 27,480 (iii) 24,780 }	{ (i) 15,180 (ii) 15,180 (iii) 12,480 }	{ (i) 25,840 (ii) 25,840 (iii) 23,140 }
60 Watt Continuous Wave ..	300Watts	60	8,000	7,500	7,200	1,600	280	{ (i) 22,180 (ii) 21,680 (iii) 21,380 }	{ (i) 9,880 (ii) 9,380 (iii) 9,080 }	{ (i) 20,580 (ii) 20,080 (iii) 19,780 }
20 Watt Continuous Wave ..	100Watts	30	5,500	5,000	4,200	1,200	200	{ (i) 19,200 (ii) 18,700 (iii) 17,900 }	{ (i) 6,900 (ii) 6,400 (iii) 5,600 }	{ (i) 13,000 (ii) 17,500 (iii) 16,700 }

For every Deputy Assistant Engineer employed add Rs. 10,000 for quarters.

TABLE II.—Annual Recurring Charges.

Type of Wireless Telegraph Station.	Power supply required.	STAFF.			TOTALS.	
		Range in miles.	Maintenance	Free quarters.	House-rent allowance in lieu of quarters.	House-rent allowance in lieu of quarters.
1½ kW. Continuous Wave ..	5-6 kW.	375	2,000	7,700	8,700	10,700
½ kW. Continuous Wave ..	2 kW.	150	1,000	7,700	8,700	9,700
100-120 Watt Continuous Wave ..	600 Watts	75	500	7,700	8,700	9,200
60 Watt Continuous Wave ..	300 Watts	60	400	6,600	7,500	7,900
20 Watt Continuous Wave ..	100 Watts	30	400	6,600	7,500	7,900

For every Deputy Assistant Engineer (Wireless) employed, the following additional charge is incurred:—

Average annual pay and allowances with free quarters ..	Rs. 6,800
Average annual pay and allowances with house-rent allowances in lieu of quarters ..	7,400

(b) Accessible to the local telegraph office and the local power supply, if the latter is to be employed.

(c) If possible, the site to be located so that its longer side is pointing roughly in the direction of the station with which it is intended to communicate.

(d) Defensibility.

Note.—See also paragraph 33.

39. No estimate of the cost of land has been included. It must be acquired and maintained by Local Government.

40. *Maintenance.*—This item depends on the range and service required. (See paragraph 28.)

The degree of reliability of power supply hardly effects the item as in most cases the cost of generating power in a station is approximately the same as the cost of purchasing it.

41. *Staff.*—This depends mainly on the service; the degree of reliability of power supply governs the question as regards employment or otherwise of an engine driver.

42. As indicated above, the cost of the staff is also affected by the question of quarters or house rent allowance in lieu.

43. Another factor which has not been considered is the question of a junior technical officer for general charge of a group of Feeder stations. If a group consists of two or more stations, an officer of the grade of Deputy Assistant Engineer (Wireless) will be required. He should be normally located at the headquarters of the group.

44. *Basis of Estimates.*—The estimates are expressed in rupees and are based on the assumption that a service of 14 hours on week days and 4 hours on Sundays throughout the year is required from the station.

This can be maintained by two operators; four are required for a 24-hour daily service.

45. The headings of the tables may be taken to embrace the following respectively:—

Heading.	Items.
<i>Apparatus and Plant</i>	Purchase of stores for generating and wireless sets, masts, mast rigging, aerials and necessary wiring stores. Freight on same from England or India, as the case may be, to the station. Cost of installing same at the station.
<i>Buildings—Station</i>	Accommodation for apparatus and plant. Foundations for sets and masts; mast anchorages and office furniture.
<i>Buildings—Quarters</i>	Quarters for 1 married, 1 unmarried operator, engine driver and 4 menials, according to scale including furniture.
<i>Maintenance</i>	Fuel, lubricating oil and consumable stores, or power supplied from external source in lieu; Materials for replacement of parts; Casual labour and petty cash.
<i>Staff</i>	Two operators, 1 engine driver, 2 peons, 1 waterman and 1 sweeper
46. The first cost and annual recurring charges on account of the Deputy Assistant Engineer (Wireless) are shown separately.	
DELHI.	R. L. NICHOLSON,
The 26th January, 1922. Director of Wireless.	

ADMINISTRATION.

The administration of radio in British India is governed by the following Acts, Notifications and Regulations:—

- A.—Indian Telegraph Act, 1885, as modified by subsequent Acts (VII and XIV of 1914).
- B.—Notifications under the Sea Customs Act, 1878.
- C.—Notifications under the Indian Telegraph Act.
- D.—The Indian Wireless Telegraphy (Shipping) Act, 1920, and Notifications under the same.
- E.—General Instructions governing Licenses for Wireless Telegraphs in British India.
- F.—Import (Wireless Telegraphs) License.
- G.—Fixed Stations License.
- H.—Mobile Stations License.

Licenses to work wireless telegraphs for business or experimental or instructional purposes are issued, and it is intended to allow "Broadcasting" under license by private individuals.

The situation as regards radio in the States in India is not quite so clear as in British India, but Government are taking steps to obtain the co-operation of the States and are endeavouring to make the conditions therein similar to those obtaining in British India.

INDIAN TELEGRAPH ACT 1885.

ACT No. XIII OF 1885.

[As amended by Act, 1914 (VII of 1914) and Act, 1914 (XIV of 1914).]

An Act to amend the law relating to Telegraphs in India.

A WHEREAS it is expedient to amend the law relating to Telegraphs in India, it is hereby enacted as follows:—

PART I.—PRELIMINARY.

1. (1) This Act may be called the Indian Telegraph Act 1885;

(2) It extends to the whole of British India including the Sonthal Parganas and the pargana of Spiti, and it applies also to—

(a) All native Indian subjects of His Majesty in any place without and beyond British India,

(b) All other British subjects within the territories of any Native State in India, and

(c) All servants of the King, whether British subjects or not, within the territories of any Native State in India.

(3) It shall come into force on the first day of October, 1885.

2. The Indian Telegraph Act 1876, is hereby repealed.

But all licenses granted and rules made under that Act or any Act thereby repealed, and now in force, shall, so far as they could be granted or made under this Act, be deemed to have been respectively granted and made hereunder.

3. In this Act, unless there is something repugnant in the subject or context:—

(1) "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for making, transmitting or receiving telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism:

(2) "Telegraph officer" means any person employed either permanently or temporarily in connection with a telegraph established, maintained, or worked by the Government, or by a person, licensed under this Act:

(3) "Message" means any communication sent by telegraph, or given to a Telegraph officer to be sent by telegraph, to be delivered:

(4) "Telegraph line" means a wire or wires used for the purpose of a telegraph with any casing, coating, tube or pipe enclosing the same and any appliances and apparatus connected therewith for the purpose of fixing or insulating the same:

(5) "Post" means a post, pole, standard, stay, strut or other above ground contrivance for carrying, suspending or supporting a telegraph line:

(6) "Telegraph authority" means the Director-General of Posts and Telegraphs, and includes any officer empowered by him to perform all or any of the functions of the Telegraph authority under this Act:

(7) "Local authority" means any Municipal Committee, District Board, body of Port Commissioners or other authority legally entitled to, or entrusted by the Government with, the control or management of any Municipal or Local fund.

PART II.—PRIVILEGES AND POWERS OF THE GOVERNMENT.

4. (1) Within British India, the Governor-General in Council shall have the exclusive privilege of establishing, maintaining and working telegraphs:

Provided that the Governor-General in Council may grant a license, on such conditions

and in consideration of such payments as he thinks fit, to any person to establish, maintain or work a telegraph within any part of British India.

Provided further that the Governor-General in Council may, by rules made under this Act and published in the *Gazette of India*, permit, subject to such restrictions and conditions as he thinks fit, the establishment, maintenance and working—

(a) Of wireless telegraphs on ships within Indian territorial waters, and

(b) Of telegraphs other than wireless telegraphs within any part of British India.

(2) The Governor-General in Council may, by notification in the *Gazette of India*, delegate to the telegraph authority all or any of his powers under the first proviso to sub-section (1).

The exercise by the telegraph authority of any power so delegated shall be subject to such restrictions and conditions as the Governor-General in Council may, by the notification, think fit to impose.

5. (1) On the occurrence of any public emergency, or in the interest of the public safety, the Governor-General in Council or a Local Government, or any officer specially authorised in this behalf by the Governor-General in Council may—

(a) Take temporary possession of any telegraph established, maintained or worked by any person licensed under this Act; or

(b) Order that any message or class of messages to or from any person or class of persons, or relating to any particular subject brought for transmission by, or transmitted, or received by, any telegraph, shall not be transmitted, or shall be intercepted, or detained, or shall be disclosed to the Government or an officer thereof mentioned in the order.

(2) If any doubt arises as to the existence of a public emergency, or whether any act done under sub-section (1) was in the interest of the public safety, a certificate signed by a Secretary to the Government of India or to the Local Government shall be conclusive proof on the point.*

6. Any Railway Company, on being required so to do by the Governor-General in Council, shall permit the Government to establish and maintain a telegraph upon any part of the land of the Company, and shall give every reasonable facility for working the same.

7. (1) The Governor-General in Council may, from time to time, by notification in the *Gazette of India*, make rules consistent with this Act for the conduct of all or any telegraphs established, maintained or worked by the Government or by persons licensed under this Act.

* As supplied to the Hyderabad Residency Bazaars, the Cantonment of Secunderabad (inclusive of the area hitherto known as the "Contingent Station" of Bolarum), the Cantonment (hitherto known as the "Contingent Station" of Aurangabad), and the Railway lands in the territories of His Highness the Nizam of Hyderabad (other than the Railway lands in Berar and those in the Notifications of the Government of India in the Foreign Department, No. 4564-I., dated the 18th November, 1891, and No. 3244-I. B, dated 26th August, 1897); for "to the Local Government" read "First Assistant Resident" (*vide* Foreign Department Notification No. 531-I. B., dated 4th February, 1904).

(2) Rules under this section may provide for all or any of the following, among other matters, that is to say :—

(a) The rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted;

(b) The precautions to be taken for preventing the improper interception or disclosure of messages;

(c) The period for which, and the conditions subject to which telegrams and other documents belonging to, or being in the custody of, telegraph officers, shall be preserved; and

(d) The fees to be charged for searching for telegrams or other documents in the custody of any Telegraph officer.

(3) When making rules for the conduct of any Telegraph established, maintained or worked by any person licensed under this Act the Governor-General in Council may, by the rules, prescribe fines for any breach of the same :

Provided that the fines so prescribed shall not exceed the following limits, namely :—

(i) When the person licensed under this Act is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees, for every day after the first during the whole or any part of which the breach continues;

(ii) When a servant of the person so licensed or any other person, is punishable for the breach, one-fourth of the amount specified in clause (i).

8. The Governor-General in Council may, at any time, revoke any license granted under section 4, on the breach of any of the conditions therein contained or in default of payment of any consideration payable thereunder.

9. The Secretary of State for India in Council shall not be responsible for any loss or damage which may occur in consequence of any Telegraph officer failing in his duty with respect to the receipt, transmission or delivery of any message; and no such officer shall be responsible for any such loss or damage, unless he causes the same negligently, maliciously or fraudulently.

PART III.—POWER TO PLACE TELEGRAPH LINES AND POSTS.

10. The telegraph authority may, from time to time, place and maintain a telegraph line under, over, along or across, and posts in or upon, any immovable property :

Provided that—

(a) The Telegraph authority shall not exercise the powers conferred by this section except for the purposes of a telegraph established or maintained by the Government, or to be so established or maintained;

(b) The Government shall not acquire any right other than that of user only in the pro-

perty under, over, along, across, in or upon which the Telegraph authority places any telegraph line or post; and

(c) Except as hereinafter provided, the Telegraph authority shall not exercise those powers in respect of any property vested in or under the control or management of any local authority, without the permission of that authority; and

(d) In the exercise of the powers conferred by this section, the Telegraph authority shall do as little damage as possible, and, when it has exercised those powers in respect of any property other than that referred to in clause (c), shall pay full compensation to all persons interested for any damage sustained by them by reason of the exercise of those powers.

11. The Telegraph authority may, at any time, for the purpose of examining, repairing, altering or removing, any telegraph line or posts, enter on the property under, over, along, across, in or upon which the line or post has been placed.

PROVISIONS APPLICABLE TO PROPERTY VESTED IN OR UNDER THE CONTROL OR MANAGEMENT OF LOCAL AUTHORITIES.

12. Any permission given by a local authority under section 10, clause (c), may be given subject to such reasonable conditions as that authority thinks fit to impose, as to the payment of any expenses to which the authority will necessarily be put in consequence of the exercise of the powers conferred by that section, or as to the time or mode of execution of any work, or as to any other thing connected with or relative to any work undertaken by the Telegraph authority under those powers.

13. When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property vested in or under the control or management of a local authority, and the local authority, having regard to circumstances which have arisen since the telegraph line or post was so placed, considers it expedient that it should be removed or that its position should be altered, the local authority may require the Telegraph authority to remove it or alter its position, as the case may be.

14. The telegraph authority may, for the purpose of exercising the powers conferred upon it by this Act in respect of any property vested in or under the control or management of a local authority, alter the position thereunder of any pipe (not being a main) for the supply of gas or water, or of any drain (not being a main drain) :—

Provided that—

(a) When the Telegraph authority desires to alter the position of any such pipe or drain, it shall give reasonable notice of its intention to do so, specifying the time at which it will begin to do so, to the local authority, and, when the pipe or drain is not under the control of the local authority, to the person under whose control the pipe or drain is;

(b) A local authority or person receiving notice under clause (a) may send a person to superintend the work, and the Telegraph authority shall execute the work to the reasonable satisfaction of the person so sent.

15. (1) If any dispute arises between the Telegraph authority and a local authority in consequence of the local authority refusing the permission referred to in section 10, clause (c), or prescribing any condition under section 12, or in consequence of the Telegraph authority omitting to comply with a requisition made under section 13, or otherwise in respect of the exercise

NOTE.—The Telegraph Act was declared in force in Upper Burma (except the Shan States) by the Upper Burma Laws Act, 1886 (XX of 1886), s. 6 (1) and is in force there under s. 4 and the First Schedule to the Burma Laws Act, 1898 (XIII of 1898) Bur. Code by which Act XX of 1886 has been repealed; in the Santhal Parganas by the Santhal Pargana Settlement Regulations (III of 1872), s. 3, as amended by the Santhal Parganas Justice and Laws Regulation, 1899 (III of 1899), s. 3, Ben. Code; in British Baluchistan see s. 3 and Schedule to the British Baluchistan Laws Regulation, 1900 (I of 1890), Bal. Code; and in the Angul District by notification under s. 5 of the Angul District Regulation, 1894 (I of 1894), Ben. Code, see *Calcutta Gazette*, 1904, Pt. I, p. 1298.

of the powers conferred by this Act, it shall be determined by such officer as the Local Government may appoint either generally or specially in this behalf.

(2) An appeal from the determination of the officer so appointed shall lie to the Local Government; and the order of the Local Government shall be final.

PROVISIONS APPLICABLE TO OTHER PROPERTY.

16. (1) If the exercise of the powers mentioned in section 10 in respect of property referred to in clause (d) of that section is resisted or obstructed, the District Magistrate may, in his discretion, order that the Telegraph authority shall be permitted to exercise them.

(2) If, after the making of an order under sub-section (1), any person resists the exercise of those powers, or, having the control over the property, does not give all facilities for their being exercised, he shall be deemed to have committed an offence under section 188 of the Indian Penal Code.

(3) If any dispute arises concerning the sufficiency of the compensation to be paid under section 10, clause (d), it shall, on application for that purpose by either of the disputing parties to the District Judge within whose jurisdiction the property is situate, be determined by him.

(4) If any dispute arises as to the persons entitled to receive compensation, or as to the proportions in which the persons interested are entitled to share in it, the Telegraph authority may pay into the Court of the District Judge such amount as he deems sufficient, or, where all the disputing parties have in writing admitted the amount tendered to be sufficient, or the amount has been determined under sub-section (3), that amount; and the District Judge, after giving notice to the parties and hearing such of them as desire to be heard, shall determine the persons entitled to receive the compensation, or, as the case may be, the proportions in which the persons interested are entitled to share in it.

(5) Every determination of a dispute by District Judge under sub-section (3) or sub-section (4) shall be final:

Provided that nothing in this sub-section shall affect the right of any person to recover by suit the whole or any part of any compensation paid by the Telegraph authority, from the person who has received the same.

17. (1) When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property not being property vested in or under the control or management of a local authority, and any person entitled to do so, desires to deal with that property in such a manner as to render it necessary or convenient that the telegraph line or post should be removed to another part thereof or to a higher or lower level or altered in form, he may require the Telegraph authority to remove or alter the line or post accordingly:

Provided that, if compensation has been paid under section 10, clause (d), he shall, when making the requisition, tender to the Telegraph authority the amount requisite to defray the expense of the removal or alteration, or half of the amount paid as compensation, whichever may be the smaller sum.

(2) If the Telegraph authority omits to comply with the requisition the person making it may apply to the District Magistrate within whose jurisdiction the property is situate to order the removal or alteration.

(3) A District Magistrate receiving an application under sub-section (2) may, in his discretion, reject the same or make an order, absolutely

on subject to conditions, for the removal of the telegraph line or post to any other part of the property or to a higher or lower level or for the alteration of its form; and the order so made shall be final.

PROVISIONS APPLICABLE TO ALL PROPERTY.

18. (1) If any tree standing or lying near a telegraph line interrupts, or is likely to interrupt, telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, cause the tree to be removed or dealt with in such other way as he deems fit.

(2) When disposing of an application under sub-section (1), the Magistrate shall, in the case of any tree in existence before the telegraph line was placed, award to the persons interested in the tree such compensation as he thinks reasonable, and the award shall be final.

19. Every telegraph line or post placed before the passing of this Act under, over, along, across, in or upon any property, for the purposes of a telegraph established or maintained by the Government, shall be deemed to have been placed in exercise of the powers conferred by, and after observance of all the requirements of, this Act.

19A. (1) Any person desiring to deal in the legal exercise of a right with any property in such a manner as is likely to cause damage to a telegraph line or post which has been duly placed in accordance with the provisions of this Act, or to interrupt or interfere with telegraphic communication, shall give not less than one month's notice in writing of the intended exercise of such right to the Telegraph authority, or to any Telegraph officer whom the telegraph authority may empower in this behalf.

(2) If any such person without having complied with the provisions of sub-section (1) deals with any property in such a manner as is likely to cause damage to any telegraph line or post, or to interrupt or interfere with telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, order such person to abstain from dealing with such property in such manner for a period of not exceeding one month from the date of his order, and forthwith to take such action with regard to such property as may be, in the opinion of the Magistrate, necessary, to remedy or prevent such damage, interruption or interference during such period.

(3) A person dealing with any property in the manner referred to in sub-section (1) with the *bona fide* intention of averting imminent danger of personal injury to himself or other human being shall be deemed to have complied with the provisions of the said sub-section if he gives notice of the intended exercise of the right as is in the circumstances possible, or where no such previous notice can be given without incurring the imminent danger referred to above, if he forthwith gives notice of the actual exercise of such right to the authority or officer specified in the said sub-section.

19B. The Governor-General in Council may, by notification in the *Gazette of India*, confer upon any licensee under section 4, in respect of the extent of his license and subject to any conditions and restrictions which the Governor-General in Council may think fit to impose and to the provisions of this Part, all or any of the powers which the Telegraph authority possesses under this Part with regard to a telegraph established or maintained by the Government or to be so established or maintained:

Provided that the notice prescribed in section 19A shall always be given to the Telegraph authority or officer empowered to receive notice under section 19A (1).

PART IV.—PENALTIES.

20. (1) If any person establishes, maintains or works a telegraph within British India in contravention of the provisions of section 4 or otherwise than as permitted by rules made under that section, he shall be punished, if the telegraph is a wireless telegraph with imprisonment which may extend to three years or with fine, or with both, and, in any other case, with a fine which may extend to one thousand rupees.

(2) Notwithstanding anything contained in the Code of Criminal Procedure, 1898, offences under this section in respect of a wireless telegraph shall, for the purposes of the said code, be bailable and non-cognizable.

(3) When any person is convicted of an offence punishable under this section, the Court before which he is convicted may direct that the telegraph in respect of which the offence has been committed, or any part of such telegraph, be forfeited to His Majesty.

20A. If the holder of a license granted under section 4 contravenes any condition contained in his license, he shall be punished with fine which may extend to one thousand rupees and with a further fine which may extend to five hundred rupees for every week during which the breach of the condition continues.

21. If any person, knowing or having reason to believe that a telegraph has been established or is maintained or worked in contravention of this Act, transmits or receives any message by such telegraph, or performs any service incidental thereto, or delivers any message for transmission by such telegraph, or accepts delivery of any message sent thereby, he shall be punished with fine which may extend to fifty rupees.

22. If a railway company, or an officer of a railway company, neglects or refuses to comply with the provisions of section 6, it or he shall be punished with fine which may extend to one thousand rupees for every day during which the neglect or refusal continues.

23. If any person—

(a) Without permission of competent authority enters the signal room of a Telegraph office of the Government, or of a person licensed under this Act, or

(b) Enters a fenced enclosure round such a Telegraph office in contravention of any rule or notice not to do so, or

(c) Refuses to quit such room or enclosure on being requested to do so by any officer or servant employed therein, or

(d) Wilfully obstructs any such officer or servant in the performance of his duty, he shall be punished with fine which may extend to five hundred rupees.

24. If any person does any of the acts mentioned in section 23 with the intention of unlawfully learning the contents of any message, or of committing any offence punishable under this Act, he may (in addition to the fine with which he is punishable under section 23) be punished with imprisonment for a term which may extend to one year.

25. If any person, intending—

(a) To prevent or obstruct the transmission or delivery of any message, or

(b) To intercept or to acquaint himself with the contents of any message, or

(c) To commit mischief, damages, removes, tampers with or touches any battery, machinery, telegraph line, post or other

thing whatever, being part of or used in or about any telegraph or in the working thereof, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

25A. If, in any case not provided for by section 25, any person deals with any property and thereby wilfully or negligently damages any telegraph line or post duly placed on such property in accordance with the provisions of this Act, he shall be liable to pay the Telegraph authority such expenses (if any) as may be incurred in making good such damage, and shall also, if the telegraphic communication is by reason of the damage so caused interrupted, be punishable with a fine which may extend to one thousand rupees:

Provided that the provisions of this section shall not apply where such damage or interruption is caused by a person dealing with any property in the legal exercise of a right if he has complied with the provisions of section 19A (1).

26. If any Telegraph officer, or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office—

(a) Wilfully secretes, makes away with or alters any message which he has received for transmission or delivery, or

(b) Wilfully, and otherwise than in obedience to an order of the Governor-General in Council or of a Local Government, or of an officer especially authorised by the Governor-General in Council to make the order, omits to transmit, or intercepts or detains, any message or any part thereof, or otherwise than in pursuance of his official duty or in obedience to the direction of a competent Court, discloses the contents or any part of the contents of any message to any person not entitled to receive the same, or

(c) Divulges the purport of any telegraphic signal to any person not entitled to become acquainted with the same,

he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

27. If any Telegraph officer transmits by telegraph any message on which the charge prescribed by the Government, or by a person licensed under this Act, as the case may be, has not been paid, intending thereby to defraud the Government or that person, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

28. If any Telegraph officer or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office, is guilty of any act of drunkenness, carelessness, or other misconduct whereby the correct transmission or the delivery of any message is impeded or delayed, or if any Telegraph officer loiters or delays in the transmission or delivery of any message, he shall be punished with imprisonment for a term which may extend to three months, or with fine which may extend to one hundred rupees, or with both.

29. If any person transmits or causes to be transmitted by telegraph a message which he knows to be false or fabricated, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

29A. If any person, without due authority—

(a) Makes or issues any document of a nature reasonably calculated to cause it to be believed that the document has been

issued by, or under the authority of, the Director-General of Posts and Telegraphs, or

(b) Makes on any documents any mark in imitation of or similar to, or purporting to be, any stamp or mark of any Telegraph office under the Director-General of Posts and Telegraphs, or a mark of a nature reasonably calculated to cause it to be believed that the document so marked has been issued by, or under the authority of, the Director-General of Posts and Telegraphs, he shall be punished with fine which may extend to fifty rupees.

30. If any person fraudulently retains, or wilfully secretes, makes away with, or detains a message which ought to have been delivered to some other person, or, being required by a Telegraph officer to deliver up any such message, neglects or refuses to do so, he shall be punished with imprisonment for a term which may extend to two years, or with fine, or with both.

31. A Telegraph officer shall be deemed a public servant within the meaning of sections 161, 162, 163, 164 and 165 of the Indian Penal Code; and in the definition of "legal remuneration" contained in the said section 161, the word "Government" shall, for the purposes of this Act, be deemed to include a person licensed under this Act.

32. Whoever attempts to commit any offence punishable under this Act shall be punished with the punishment herein provided for the offence.

PART V.—SUPPLEMENTAL PROVISIONS.

33. (1) Whenever it appears to the Local Government that any act causing or likely to cause wrongful damage to any telegraph is repeatedly and maliciously committed in any place, and that the employment of an additional Police force in that place is thereby rendered necessary, the Local Government may send such additional Police force as it thinks fit to the place and employ the same therein so long as in the opinion of that Government the necessity of doing so continues.

(2) The inhabitants of the place shall be charged with the cost of the additional Police force, and the District Magistrate shall, subject to the orders of the Local Government, assess the proportion in which the cost shall be paid by the inhabitants according to his judgment of their respective means.

(3) All moneys payable under sub-section (2) shall be recoverable either under the warrant of a Magistrate by distress and sale of the movable property of the defaulter within the local limits of his jurisdiction, or by suit in any competent Court.

(4) The Local Government may by order in writing define the limits of any place for the purposes of this section.

34.* (1) This Act, in its application to the Presidency-towns, shall be read as if the words, "District Magistrate" in section 16, sub-section (1), and section 17, sub-sections (2) and (3), for the words "Magistrate of the first or second class" in section 18, sub-section (1), and section 19A, sub-section (2) and for the word "Magistrate" in section 18, sub-section (2), there had been enacted the words "Commissioner of Police," and for the words "District Judge" in section 16, sub-sections (3), (4) and (5), the words "Chief Judge of the Court of Small Causes."

(2) Section 16, in its application to the town of Rangoon, shall be read as if for the words "District Judge," wherever they occur in that section, there had been enacted the word "Judge of the Court of Small Causes."

(3) The fee in respect of an application to the Chief Judge of a Presidency Court of Small Causes under sub-section (3) of section 16 shall be the same as would be payable under the Court-fees Act, 1870, in respect of such an application to a District Judge beyond the limits of a Presidency-town, and fees for summonses and other processes in proceedings before the Chief Judge under sub-section (3) or sub-section (4) of that section shall be payable according to the scale set forth in the fourth schedule to the Presidency Small Cause Courts Act, 1882.

IMPORT OF APPARATUS FOR WIRELESS TELEGRAPHS INTO BRITISH INDIA.

B The bringing by sea or by land into British India of any apparatus for wireless telegraphs is restricted by Notifications of the Government of India in the Department of Commerce, No. 6081 of the 22nd October, 1921, and No. 352, of the 21st January, 1922, to cases in which:—

(1) Such apparatus is imported by any person to whom a license to establish, maintain and work a wireless telegraph has been granted under the first proviso to sub-section (1) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885); or

(2) A license to import such apparatus has been granted by the Director-General of Posts and Telegraphs and in consideration of the grant of such license a bond for such amount as may in each case be directed by the Director-General of Posts and Telegraphs, has been executed by the licensee.

No. 23 P. W.

GOVERNMENT OF INDIA.—PUBLIC WORKS DEPARTMENT.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

C In exercise of the powers conferred by sub-section (2) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry, No. 4837-88, dated the 20th June, 1914, the Governor-General in Council is pleased to delegate to the telegraph authority the power to grant a license to establish, maintain or work a telegraph within any part of British India: provided that every such license shall be subject to the following conditions, namely:—

(1) That the telegraph shall be used solely for the transmission of unpaid messages relating to the business of the licensee and in the case of a wireless telegraph licensed for research, experimental or instructional purposes that the telegraph is solely used for such purposes:

(2) That the telegraph authority may at any time take possession of the telegraph should he consider it necessary; and

(3) That the license shall be revocable on the breach of any of the conditions therein specified.

S. D'A. CROOKSHANK, Colonel,
Secretary to the Government of India,

* S. 34 was added by the Indian Telegraphs (Presidency Towns) Act, 1888 (XI of 1888), General Acts, Vol. IV.

No. 24 P. W.
GOVERNMENT OF INDIA.—PUBLIC WORKS
DEPARTMENT.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry No. 1984-P. & T., dated the 24th February, 1917, the Governor-General in Council is pleased to make the following rules regulating the conduct of wireless telegraphs established, maintained and worked by persons licensed under this Act:—

Short Title.—1. These rules may be called the Indian Wireless Telegraphs Rules, 1921.

Definitions.—2. In these rules, unless there is something repugnant in the subject or context—

(1) "*Certificate of Competency*" means a certificate of competency granted by the telegraph authority under these rules or by the proper authority in any British Possession or Protectorate entitling the holder to be employed as a wireless telegraph operator.

(2) "*Convention*" means the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and includes any modification of the said Convention or Regulations made from time to time.

(3) "*Harbour*" includes harbours, whether natural or artificial, estuaries, navigable rivers, piers, jetties and other works in or at which ships can obtain shelter, or ship or unshipped goods or passengers.

(4) "*Service Signalling*" means signalling by means of any system of wireless telegraph between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval, Military or Air Forces.

3. *Working of wireless telegraphs in ships within Indian territorial waters.*—Except with the general or special permission in writing of the telegraph authority no person shall work or use a wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is in any harbour in India.

4. No person shall send any message by means of the wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is within Indian territorial waters when and where such messages can be forwarded by a Government telegraph.

5. No person shall work or use the wireless telegraph in any ship whilst the ship is within Indian territorial waters in such a way as to interrupt or interfere with service signalling or the transmission of messages between other wireless stations.

6. When communications are made by wireless telegraph between any ship within Indian territorial waters and a land station the rules given in the handbook, "*General Rules and Departmental Instructions for Radiotelegraph Stations in India*," shall be observed.

7. Nothing in these rules shall apply to the use of wireless telegraphs within Indian territorial waters for the purpose of making or answering signals of distress.

8. *Working of wireless telegraphs in aircraft over British India or over Indian territorial waters.*—Except with the general or special permission in writing of the Telegraph authority no person shall work or use a wireless telegraph in any aircraft (other than one of the Royal Air Force) whilst the aircraft is over British India or over Indian territorial waters, except in accordance with the following restrictions:—

(a) The wireless apparatus shall not be used except during actual flight or in case of forced landing;

(b) It may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

- (i) Distress signals;
- (ii) Meteorological information;
- (iii) Forced landings and landing instructions;
- (iv) Ascertaining or indicating position;
- (v) Supply of fuel and spare parts;
- (vi) Origin, destination or course of flight;

(c) The Aircraft Normal Wave (900 metres continuous wave) and no other wave shall be employed for the sending and receipt of messages to and from—

- (i) Other aircraft stations;
- (ii) Aviation stations;

(d) The Aircraft Ship Wave (600 metres interrupted continuous wave) and no other wave shall be employed for the sending and receipt of—

(i) Messages to and from British ships-of-war and all merchant ships;

(ii) Such messages as are rendered necessary by reason of exceptional emergency and do not come within the scope of the above mentioned provisions for the use of the Aircraft Normal Wave;

(e) The rules given in the handbook "*General Rules and Departmental Instructions for Radiotelegraph Stations in India*" shall be observed;

(f) Service signalling or the transmission of messages between other wireless telegraph stations shall not be interfered with;

Provided that nothing in these restrictions shall apply to the use of wireless telegraphs for the purpose of making or answering signals of distress.

9. *Certificate of Competency.*—No person shall work the transmitting apparatus of a wireless telegraph in British India or in any ship or aircraft registered in British India unless he is a British subject or the subject of a State in India and holds a certificate of competency.

10. Certificates of competency shall be granted by the Telegraph authority subject to an examination, shall be in forms set out in the First and Second Schedules annexed hereto, shall indicate the system or systems in which the holder's examination was conducted, and shall certify that the holder—

(a) Is able to send and receive, by sound, messages in plain language in the International Morse Code and to send and receive speech clearly by wireless telephone apparatus, the speed at which Morse is to be sent and received being as follows (five letters being counted as one word):—

(i) *First Class.*—Not less than 20 words per minute.

(ii) *Second Class.*—12 to 19 words per minute.

(iii) *Third Class.*—Not less than 10 words per minute;

(b) Is able to adjust the apparatus ordinarily used so as to suit the varying conditions of working without using excessive power;

(c) Has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

11. Applications for permission to attend examinations for a certificate of competency shall be made to the Telegraph authority in the form shown in the Third Schedule to these rules,

The date and place of examination will be notified to the candidate as soon as possible after the receipt of the application.

12. No person shall be eligible to attend an examination for a certificate of competency who is not a British subject, or the subject of a State in India.

13. Candidates for examination for first class certificates must be not less than 18 years of age.

14. The application form shall be forwarded to the examining officer by the Telegraph authority before the examination takes place.

15. Candidates for examination shall pay an examination fee of five rupees by means of postage stamps affixed to the application form.

16. *Scope of Examination.*—Candidates at an examination will be expected to—

(a) Send with an ordinary Morse key for five consecutive minutes at the prescribed speed. Accuracy and spacing will be taken into consideration;

(b) Receive and write down legibly for five consecutive minutes at the prescribed speed. A double headgear telephone receiver will be used for reception;

(c) Understand simple diagrams of the apparatus in which he is being examined and to make such diagrams from such apparatus;

(d) Be able to connect up the apparatus with the help of such diagrams so far as this is required in the system in which he is being examined;

(e) Name the parts of the apparatus and indicate their uses;

(f) Recognise, detect and remedy common faults in the apparatus;

(g) Adjust the apparatus as regards wavelength;

(h) Adjust the apparatus as regards power and generally regulate the transmitting gear and adjust the receiving gear;

(i) Answer questions on the method of handling radiotelegraph traffic as set out in the handbook issued by the telegraph authority (*General Rules and Departmental Instructions for Radiotelegraph Stations in India*) and the Service Regulations attached to the Convention.

17. *Declaration to observe secrecy.*—If the candidate passes the examination he shall make a declaration before the examining officer that he will observe the secrecy of correspondence which comes to his knowledge in the course of duty.

18. (1) *Photograph of Candidate.*—A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.). This will be checked by the examining officer.

(2) If the candidate is successful in the examination he will sign the photograph in the presence of the examining officer. The examining officer will attach it to the candidate's application form, and return both to the telegraph authority.

(3) The photograph will be affixed to the back of the certificate of competency in the office of the Telegraph authority and stamped with a special date stamp overlapping photograph and certificate.

(4) The certificate will be completed and sent to the candidate by post.

19. *Failure.*—In case of failure at an examination the candidate will not be re-examined until after the lapse of three months. An additional fee of five rupees shall be payable in respect of such re-examination.

20. (1) *Power of the telegraph authority to endorse, suspend or cancel certificate.*—Should the holder of a certificate of competency be proved to the satisfaction of the Telegraph authority wilfully or negligently to have failed to comply with the provisions of the Convention or any other regulations which may be issued from time to time for his guidance the Telegraph authority may endorse, suspend or cancel the certificate.

(2) The Telegraph authority may require the holder of a certificate of competency to produce the same for action under sub-rule (1), and the holder shall comply with such requisition.

FIRST SCHEDULE.

(See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

1st and 2nd Class.—Wireless Telegraphs (including Telephone).

This is to certify that under the provisions of the Radiotelegraph Convention, 1912, Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than _____ words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date _____ 192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a _____ class operator.

Signature

Director-General of Posts and Telegraphs, India.

Date _____ 192

Signature of Holder

Date of Birth _____

Place of Birth _____

Description and Photograph of Holder.

Height _____ feet _____ inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of the holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

* It is not intended to limit the employment of the holder to a particular system, but merely to indicate the particular system in which he was tested for adjustment of apparatus.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

SECOND SCHEDULE. (See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

3rd Class.—Wireless Telephone.

This is to certify that Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than ten words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date

192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a third class operator.

Signature

Director-General of Posts and Telegraphs,

Date

192

Signature of Holder.

Date of Birth.

Place of Birth.

Description and Photograph of Holder.

Height feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

THIRD SCHEDULE.

(See Rule 11.)

APPLICATION TO ATTEND EXAMINATION FOR CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

(Postage stamps or stamp to the value of five rupees to be affixed here.)

* It is not intended to limit the employment of the holder to a particular system, but merely to indicate the particular system in which he was tested for adjustment of apparatus.

To

THE DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS,

(Wireless Branch), INDIA.

Sir,—I beg to inform you that I wish to obtain a certificate qualifying me to act as Wireless Telegraph Operator. I declare that I am a British subject or subject of a State in India.

I am, Sir,

Your obedient servant,

Signature

Date

192

Name in full.

Date of Birth.

Place of Birth.

Address to which it is desired that the order for examination shall be sent

System or systems in which examination is desired*

Place at which the candidate would prefer to be examined*

Description of Candidate.

Height. feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

PUBLIC WORKS DEPARTMENT.

NOTIFICATION.—TELEGRAPHS.

Simla, the 22nd July, 1922.

No. 1386-P.W.—In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the Notification of the Government of India in the Department of Commerce and Industry, No. 10054-87, dated the 29th November, 1913, the Governor-General in Council is pleased to issue the following rules governing the exchange by radiotelegraph of public correspondence between coast stations in British India and ships.

DURATION OF SERVICE.

1. The service at coast stations in British India will be in accordance with the hours notified for such stations in the "International List of Radiotelegraph Stations."

FORM AND ACCEPTANCE OF TELEGRAMS.

2. The form and acceptance of telegrams will be in accordance with the rules for Foreign telegrams as given in the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137 dated the 16th September, 1909.

SPECIAL RULES FOR RADIOTELEGRAMS.

3. The sender is in every case responsible for the sufficiency and accuracy of the address of his radio-telegram.

4. (1) The address of radio-telegrams intended for ships should be drawn up as follows:—

(i) Name or description of addressee, with supplementary particulars, if necessary.

(ii) Name of the ship as in the first column of the "International List of Radiotelegraph Stations"; and,

* Every endeavour will be made to meet the convenience of candidates in this respect, but no assurance can be given that the examination will be held at the place specified.

A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.) before his examination. This will be checked by the Examining Officer.

S. D'A. CROOKSHANK, Colonel,
Secretary to the Government of India.

(iii) If intended to be transmitted through a coast station, the name of the coast station as it appears in the "International List of Radiotelegraph Stations."

(2) If desired, the name of the ship may, at the risk of the sender, be replaced by the particulars of its voyage.

5. In the case of radiotelegrams accepted on board ship for places on land it is the duty of the operator to see that the office of destination is written as shown in the first column of the "International List of Telegraph Offices."

SPECIAL RULES FOR RADIOTELEGRAMS.

6. The name and permanent address of the sender of a radiotelegram should be written on the form for purposes of record.

PREAMBLE.

7. The preamble of every radiotelegram will begin with the word "Radio."

8. On transmitting a radiotelegram from a ship over the ordinary telegraph system, the coast station will insert for "office of origin" the name of the ship of origin as it appears in the "International List of Radiotelegraph Stations," and also, when the case arises, the name of the last ship which acted as intermediary, should any re-transmission have occurred, and the name of the coast station. The code time (*i.e.*, the time of receipt of the radiotelegram at the coast station) will also be inserted, and this, together with the service instructions, the date and time of handing in, and the number of words signalled by the ship will be transmitted.

CHARGES FOR RADIOTELEGRAMS.

9. The charge for a radiotelegram must in every case be prepaid by the sender.

10. The coast station charge and the ship station charge are notified in the "International List of Radiotelegraph Stations"; and such charges as are fixed from time to time as far as British India is concerned, are published in the Post and Telegraph Guide.

RADIOTELEGRAMS FOR DELIVERY BY POST FROM A PORT OF CALL OF THE SHIP TO WHICH THEY ARE TRANSMITTED.

11. (1) Radiotelegrams may be accepted for a ship with the object of being forwarded by post from a port of call. Re-transmission by radiotelegraphy is not permitted in such cases.

(2) The address must be drawn up as follows:—

(a) The paid instruction "Poste" followed by the name of the port where the radiotelegram is to be posted.

(b) Name and address of the addressee.

(c) Name of the ship station which is to carry out the posting.

(d) Name of the coast station in communication with the ship, unless the message is exchanged directly between two ships.

Example:—

"= Poste Buenosaires = Smith 14 Calle Prat Valparaiso Avon Lizard."

(3) A charge for postage equivalent to 25 gold centimes at the rate of exchange from time to time fixed by the Governor-General in Council shall be payable by the sender in addition to the radiotelegraph charges.

(4) A radiotelegram of this nature received on board a ship will be posted as a paid letter at the port indicated and particulars of posting noted on the duplicate form.

CLASSES OF TELEGRAMS NOT ADMITTED IN THE RADIOTELEGRAPHIC SERVICE.

12. Certain special classes of telegrams, which are admitted in the international telegraph service, cannot be accepted in the radiotelegraphic service. They are as follows:—

(a) Telegraphic money orders.

(b) Telegrams "to follow the addressee."

(c) Paid service telegrams asking for repetition of information, except as regards transmission over the ordinary telegraph system.

(d) Urgent telegrams, except as regards transmission over the telegraph system of Administrations which accept such telegrams.

(e) Telegrams at deferred rates.

PRIORITY OF MESSAGES.

13. Subject to the proviso that signals of distress shall take precedence over all other messages, radiotelegrams shall be transmitted in the order given in Rule 158 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, viz.:—

(a) State (or Government) telegrams.

(b) Service telegrams.

(c) Private telegrams.

(d) Press telegrams.

UNDELIVERED RADIOTELEGRAMS FROM SHIPS.

14. When a radiotelegram from a ship at sea cannot be delivered to the addressee on land, the fact, with the reason assigned for the non-delivery, will be communicated to the ship for the information of the sender. If the sender is desirous of altering or adding to an address, he may do so by means of a paid service advice.

UNDELIVERED RADIOTELEGRAMS ADDRESSED TO SHIPS.

15. When a radiotelegram reaching a ship at sea cannot be delivered, the office or ship station of origin will be informed by service advice.

16. (1) The sender of a radiotelegram to a ship may indicate the maximum period for which he desires the message to be kept at the coast station.

(2) If the sender does not specify any period, the office of origin will be informed by service advice on the morning of the 8th day after the despatch of the radiotelegram that it has not been possible to deliver the message to the ship of destination. The sender, who will be informed by the office of origin, may then, if he chooses, request, by means of a paid service advice to the coast station (the prepayment being at the rate for a message to the coast station, without payment of the wireless rate either for the coast station or for the ship), that the radiotelegram may be retained for a further period of 9 days, and so on. If no such request is received, the radiotelegram shall be treated as undeliverable at the end of the 9th day, not including the day of handing in.

(3) If the coast station knows that the ship has passed beyond its range of transmission before the radiotelegram could be transmitted to it, the office of origin shall be informed accordingly by service advice without delay for intimation to the sender, who may then, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

MESSAGE FORMS TO BE PRESERVED.

17. The originals of radiotelegrams and the documents relating to them shall be kept for seven days only in Government telegraph and radiotelegraph offices, after which they shall be sent to the Deputy Accountant-General, Telegraph Check Office, Calcutta, where they shall be preserved for at least fifteen months, reckoned from the month following that of handing in.

REFUNDS.

18. Refunds shall be governed by Rules 348 to 358 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, subject to the following conditions:—

(a) No refund shall be granted in respect of any radiotelegram inadmissible* under Rule 12 of these rules;

(b) The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

(c) If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the coast station and ship station charges in respect of such radiotelegram shall be refunded to the sender.

S. D'A. CROOKSHANK, Colonel.

Secretary to the Government of India.

ACT NO. XLI. OF 1920.

PASSED BY THE INDIAN LEGISLATIVE COUNCIL,
(Received the assent of the Governor-General on the 16th September, 1920.)

DAn Act to provide for the installation of Wireless Telegraphy on ships registered in British India and for other purposes.

Whereas it is expedient to provide for the installation of wireless telegraphy on ships registered in British India, and for other purposes:

It is hereby enacted as follows:—

1. (1) This Act may be called the Indian Wireless Telegraphy (Shipping) Act, 1920.

(2) It extends to the whole of British India.

(3) It shall come into force on such date as the Governor-General in Council may, by notification in the *Gazette of India*, direct.

2. (1) In this Act unless there is anything repugnant in the subject of context—

(a) "Passenger steamer" means a steamer which carries more than twelve passengers;

(b) "Prescribed" means prescribed by rules made under this Act; and

(c) "Registered in British India" means registered in British India under the Merchant Shipping Acts, 1894 to 1916, or under any Act of the Governor-General in Council for the time being in force providing for the registration of ships.

(2) All words and expressions used in this Act and defined in the Merchant Shipping Acts, 1894 to 1916, and not hereinbefore defined, shall be deemed to have the same meanings respectively attributed to them by those Acts.

3. (1) Every sea-going British ship registered in British India, being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation of the prescribed description and shall maintain a wireless telegraph service of the prescribed nature and shall be provided with such certificated operators and watchers as may be prescribed:

Provided that the Governor-General in Council may, by notification in the *Gazette of India*, exempt from the obligations imposed by this Act any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other

circumstances of the case, the provision of a wireless telegraph installation is unnecessary or unreasonable.

(2) If this section is not complied with in the case of any such ship, the master or owner of the ship shall be punishable in respect of each offence with a fine which may extend to one thousand rupees.

4. (1) The Governor-General in Council may appoint officers (hereinafter referred to as wireless telegraphy inspectors) for the purpose of seeing that the requirements of this Act are complied with on board any ship.

(2) A wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certificated operators and watchers in conformity with this Act, and for this purpose may go on board any ship at all reasonable times and do all things necessary for the proper inspection of the ship for the purpose of this Act and may also require the master of the ship to supply him with any information which it is in the power of the master to supply for that purpose, including the production of any certificate granted under this Act in respect of the installation, and of the certificates of the operators and watchers on the ship.

(3) If a wireless telegraphy inspector finds that a ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency; and also pointing out what in his opinion is requisite to remedy the same.

(4) Every notice given under sub-section (3) shall be communicated, in the prescribed manner, to the Chief Officer of Customs of any port at which the ship may seek to obtain port-clearance, who shall order that the ship shall be detained until a certificate under the hand of a wireless telegraphy inspector is produced to the effect that the ship is properly provided with a wireless telegraph installation and certificated operators and watchers in conformity with this Act.

5. The provisions of this Act shall, as from a date three months after the commencement of this Act, apply to ships other than British ships registered in British India while they are within any port in British India in like manner as they apply to British ships registered in British India.

6. (1) The Governor-General in Council may make rules to carry out the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power such rules may prescribe—

(a) The nature of the wireless telegraph installation to be provided and of the service to be maintained, and the number, grades and qualifications of certified operators and watchers to be carried;

Provided that no ship shall be required to carry more than one operator, unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914:

(b) The manner in which a notice given under sub-section (3) of section 4 shall be communicated to the Chief Officer of Customs.

(3) Rules made under this section shall be published in the *Gazette of India* and shall therefore have effect as if enacted in this Act.

7. A wireless telegraphy inspector appointed under this Act shall be deemed to be a public servant within the meaning of the Indian Penal Code.

8. No suit or other legal proceeding shall lie against any person for anything done or in good faith intended to be done under this Act.

No. 611.

GOVERNMENT OF INDIA.

DEPARTMENT OF COMMERCE.

Delhi, the 4th February, 1922.

NOTIFICATION.

MERCHANT SHIPPING.

In exercise of the power conferred by the proviso to sub-section (1) of section 3 of the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920), the Governor-General in Council is pleased to exempt from the obligations imposed by the said Act all ships engaged in the coasting trade except ships engaged in the following runs, namely:—

- (1) Calcutta to Rangoon.
- (2) " " Port Blair.
- (3) " " Penang.
- (4) " " Colombo.
- (5) Madras ports to Rangoon.
- (6) " " Port Blair.
- (7) " " Penang.
- (8) Rangoon to Calcutta.
- (9) " " Port Blair.
- (10) " " Penang.
- (11) Bombay to Aden.
- (12) " " Karachi.
- (13) Ports in British India to Singapore.

Explanation—"Coasting trade" means trade exclusively carried on between the ports specified in the definition of "home-trade ship" in section 118 of the Indian Merchant Shipping Act, 1859 (1 of 1859).

Sgd. H. A. F. LINDSAY,
Secretary to the Government of India.

DEPARTMENT OF COMMERCE.

NOTIFICATION.

MERCHANT SHIPPING.

Delhi, the 4th February, 1922.

No. 612.—In exercise of the power conferred by section 6 of the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920), the Governor-General in Council is pleased to make the following rules—

1. (1) *Short title and commencement*.—These rules may be called the Indian Wireless Telegraphy (Shipping) Rules, 1922.
- (2) They shall come into force on the 1st January, 1923.

2. *Definition*.—In these rules, unless there is anything repugnant in the subject or context—

"Coasting trade" means trade exclusively carried on between the ports specified in the definition of "home-trade ship" in section 118 of the Indian Merchant Shipping Act, 1859.

"Number of hours occupied in a voyage from port to port" means the normal number of hours occupied in a voyage between one port of call and the next. In the case of river ports the duration of the voyage shall count from pilot ground to pilot ground.

"The Act" means the Indian Wireless Telegraphy (Shipping) Act, 1920.

3. *Classification of Ships*.—For the purpose of these rules ships shall be classified as follows:

Class I ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II ships not engaged in the coasting trade carrying not less than 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

4. *Installation to comply with requirements of Radiotelegraph Convention, 1912*.—The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement or of any international agreement by which the said Convention of 1912 may be superseded.

5. *Nature of Installation*.—The installation shall be of the spark or interrupted continuous wave type.

6. (1) *Installation to consist of a normal and an emergency installation except in certain cases*.—The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as with those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly, and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

7. *Means of communication to be provided between the bridge and wireless telegraph room*.—There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means, and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

8. *Requirements to be complied with by ships not fitted with automatic apparatus*.—If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch—

<i>Nature of Voyage.</i>	<i>Number and Grade of Operators.</i>
(a) Voyage exceeding 48 hours from port to port.	Three operators of whom one shall hold a First Grade certificate and not more than one a Third Grade certificate.
(b) Voyage exceeding 8 hours, but not exceeding 48 hours from port to port.	Two operators, of whom one shall hold a First or a Second Grade certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in Schedule A to these rules, and either a certificated operator or a certificated watcher shall always be on watch at other times—

SCHEDULE A.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A.	Meridian of 90° East	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean.	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian or 70° W. South of the Coast of America, West Coast of America	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

*Nature of Voyage.**Number and Grade of Operators and Watchers.*

(a) Voyage exceeding 48 hours from port to port.

One operator who shall hold a First or a Second Grade certificate, and two watchers.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.

One operator who shall hold a First or a Second Grade certificate, and one watcher.

(c) Voyage not exceeding 8 hours from port to port.

One operator who shall hold a First or a Second Grade certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in Schedule A to these rules.

9. Ships of Class III to be fitted with approved automatic apparatus.—In the event of an automatic apparatus for registering the signal of distress being approved by the Governor-General in Council a ship of Class III shall be

fitted with such apparatus unless the ship is employed on voyages on which normally not more than 8 hours are taken to get from one port of call to the next, but in such a case the operator shall be on watch during the whole time of the voyage.

10. Requirements to be complied with by ships fitted with automatic apparatus.—If fitted with automatic apparatus for registering the signal of distress approved as aforesaid—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall always be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus—

*Nature of Voyage.**Number and Grade of Operators.*

(a) Voyage exceeding 48 hours from port to port.

Two operators, one of whom shall hold a First Grade certificate.

(b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator, who shall hold a First or a Second grade certificate, and while at sea the operator shall be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor-General in Council, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in Schedule A to these rules.

11. *Qualifications of Operators.*—(1) Operators shall be granted First, Second or Third Grade certificates in accordance with general or special orders of the Governor-General in Council in this behalf, and watchers shall be certificated by the Director-General of Posts and Telegraphs.

(2) Until certificates are granted in accordance with such orders as aforesaid:—

(i) An operator who holds a First Class certificate of competency granted by the Director-General of Posts and Telegraphs and who has had three years' experience as an operator may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds a First or Second class certificate of competency granted by the Director-General of Posts and Telegraphs, and who has had one year's experience as a operator may be employed as if he held a Second Grade certificate.

(iii) An operator who holds a First or Second Class certificate of competency granted by the Director-General of Posts and Telegraphs, and who has had less than one year's experience as an operator may be employed as if he held a Third Grade certificate.

12. *Discretion to accept certificates granted in other countries.*—A certificate granted to an operator by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force may be accepted for the purpose of these rules as equivalent to a certificate of such grade as the Director-General of Posts and Telegraphs may think fit by general or special order to direct.

13. *Manner in which notice should be given to the Chief Officer of Customs.*—The notice required to be given under sub-section 3 of section 4 of the Act shall be in the Form in Schedule B to these rules, and a copy of every such notice shall on the same day be forwarded by the

Wireless Telegraphy Inspector issuing the notice to the Chief Officer of Customs at the port concerned.

SCHEDULE B.

Posts and Telegraph Department.

Captain	Port of
	Date

Sir,

An inspection made this day of the wireless telegraph installation on board the ss. of which you are master, indicates that the equipment does not conform to the requirements of the Indian Wireless Telegraphy (Shipping) Act, 1920, and the license issued by the Director-General, Posts and Telegraphs, in the following particulars

I am of opinion that the following steps should be taken to remedy the deficiencies
Copies of this report have been forwarded to the Chief Officer of Customs at

Wireless Inspector.

H. A. F. LINDSAY,
Secretary to the Government of India.

No. 615.

GOVERNMENT OF INDIA.
DEPARTMENT OF COMMERCE.
Delhi, the 4th February, 1922.

NOTIFICATION.

MERCHANT SHIPPING.

In exercise of the power conferred by sub-section (3) of section 1 of the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920), the Governor-General in Council is pleased to direct that the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920), shall come into force on the 1st August, 1922.

Sgd. H. A. F. LINDSAY,
Secretary to the Government of India.

DEPARTMENT OF COMMERCE.

NOTIFICATION.

MERCHANT SHIPPING.

Simla, the 22nd July, 1922.

No. 3757.—In exercise of the power conferred by sub-section (3) of section 1 of the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920), and in supersession of the notification of the Government of India in the Commerce Department, No. 615, dated the 4th February, 1922, the Governor-General in Council is pleased to direct that the said Act shall come into force with effect from the 1st January, 1923.

H. A. F. LINDSAY,
Secretary to the Government of India.

POST AND TELEGRAPHS.

GENERAL INSTRUCTIONS GOVERNING LICENSES FOR WIRELESS TELEGRAPHS IN BRITISH INDIA,
Published by Order of the Director-General of Posts and Telegraphs.

E — Except in the case of wireless telegraphs owned or worked by Government for which no license is required, no person may:—

(a) Import by sea or by land apparatus for wireless telegraphs into British India; or

(b) Establish, maintain or work a wireless telegraph in any place in British India, or in any ship or aircraft registered in British India;

except under a license granted by the Director-General on behalf of the Governor-General in Council.

Form of License.	Type of Station.	Class.	Apparatus permitted.	Class of Operator required.	Purpose.
Import	—	—	T R M S	—	Import of apparatus for wireless telegraphs into British India.
Fixed Stations*	Limited-Commercial.	I	T R M S	2nd	Transmission and Reception for business purposes.
		II	T R S	3rd	
		III	R M S	Nil.	
	Non-Commercial.	I	T R M S	3rd	Reception only for business purposes.
		II	R M S	Nil.	
		III	T R (a)	Nil.	
Mobile Stations	Ship	I, II, III	T R M S	1st and 2nd	Bonâ fide experimenters, experimental and instructional establishments and amateurs.
	Aircraft ..	—	T R M S	(b) 1st and 2nd	

T = Transmission. R = Reception. M = Morse. S = Speech.

(a) No antenna to be used.

(b) According to International Radiotelegraph Convention.

Note.—The term "Wireless Telegraphs" includes Wireless Telephony.

* Spark not permitted for Fixed Stations. Power normally limited to 100 watts.

Cancel paragraph 2 and substitute :—

2. Licenses will be granted by the Director-General in such forms as are prescribed under the classification laid down in the following table :—

3. The Director-General will not grant a license unless he is satisfied :—

(a) That the applicant is not less than 21 years of age and a British subject or a subject of an Indian State and has furnished satisfactory evidence as to character and the objects for which he requires a license.

(b) That the applicant has in view some definite object of scientific value or general public utility. If scientific research is intended the applicant should be certified as a competent investigator by a Government Department or some recognised scientific body.

(c) That the applicant can show that he is or the persons he proposes to employ are capable of working the apparatus for the objects for which he requires a license.

(d) That if the apparatus is to be used for the transmission of messages or signals using an antenna, the applicant undertakes to employ in this work only certified operators of the number and class required.

(e) That the apparatus is capable of being worked in accordance with the provisions of the license.

Duration of Licenses.—(1) All licenses will be valid for one year commencing on January 1st and expiring on December 31st. All licenses issued during the year automatically expire on December 31st.

(2) Applications for renewal must be forwarded so as to reach the Director-General by December 1st in each year.

(3) The renewal may be made at any time within one month before or one month after the date of expiry of the license.

5. **Fees.**—The fee for and in respect of all licenses shall be Rs. 10 per annum in respect of each station licensed. The fee shall be payable before the license is issued and the fee payable upon renewal shall be payable before such renewal. It should be paid by postage stamps affixed to the application form.

6. **Royalty.**—(1) The royalty to be paid for and in respect of all licensed stations shall be fixed by the Director-General and depend upon

the purpose for which the station is erected. The royalty shall be payable in the same manner as the fee.

(2) No royalty is charged in respect of non-commercial and mobile stations.

7. Application for License and Renewal.—

(1) The application for a license must be in the form shown in the first and second schedules annexed. Application forms and the form of license may be obtained on application to the Director-General of Posts and Telegraphs (Wireless Branch), India.

(2) Before granting the license the Director-General may require the applicant to furnish such additional particulars as he thinks necessary.

(3) Every license will be made out in triplicate. Two parts will be issued to the licensee and one part retained by the Director-General.

(4) The application for renewal of a license must be in writing and should state the registered numbers of the license and schedule or schedules and the period for which a renewal is desired. The renewal fee should be paid by postage stamps affixed to the application.

(5) A license will be renewed by an endorsement thereon or attachment thereto of a certificate signed by or on behalf of the Director-General.

8. Powers of Director-General to see Licenses.—

The Director-General or any officer authorised by him in this behalf may demand to be shown the license or copy of such license authorising the use of wireless telegraphs or the certificate of competency issued to the operator, and every person having such license, copy of license or certificate of competency in his possession or under his control must comply with such demand.

FIRST SCHEDULE.

APPLICATION FOR LICENSE TO ESTABLISH, MAINTAIN AND WORK WIRELESS TELEGRAPHS IN BRITISH INDIA.

1. Name of applicant (with Christian names in full)

Address

Age

Occupation

2. Is the applicant a British subject or subject of an Indian State? (Evidence of nationality and two written references as to character should be enclosed.)

3. Scientific qualifications (if any) of applicant

Particulars of any experience in working wireless telegraph apparatus.

Particulars of any certificates of competency held by applicant.

Speed at which applicant can send and receive in the Morse code.

4. Purpose for which a license is required.

5. * Particulars of apparatus to be used. (Diagrams to be furnished and attached to this form.)

- (a) Transmitting—
- (b) Receiving—
- (c) Antenna—

6. * Power to be used for transmission (A).

- (a) Source (B)
- (b) Point where measured
- (c) Volts Amperes

7. *Particulars of Stations.

Name.	Exact Location (a).	Type (b).	Class (b).	Rem.rks.

NOTES.—(a) If station is to be movable state place in which it will normally be located and area over which it is desired to move.

(b) For "Type" and "Class" see Table.

8.*Wavelengths it is desired to use:—

Transmitting.—Normal	Metres
Additional	"
Receiving.—Normal	"
Additional	"

9. * Range of waves over which apparatus is capable of being adjusted:—

Transmitting.—	Metres
Receiving.—	"

10. *Stations with which it is desired to communicate.

11. *What messages from Government stations it is desired to read and make use of? (See clause 11 of license.)

12. *Hours of working desired (I.S.T.):—

Transmitting.
Receiving.

13. If the station or stations are intended to transmit, state names, addresses and qualifications of operators.

DECLARATION.

I undertake to observe the conditions of the license and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the license. I further declare that if the apparatus is licensed for the transmission of messages, only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant.

Date 192

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless Branch), India.

Postage
Stamps

(d) D.C. or A.C.

(e) Cycles per second (A.C.)

(f) Maximum watts to be taken by transmitting instruments

* If more than one station is desired, details must be given for each station, including sketch of antenna, showing dimensions.

(A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.

(B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available and if supply mains state voltage, whether direct or alternating and periodicity.

SECOND SCHEDULE.

APPLICATION FOR LICENSE TO ESTABLISH, MAINTAIN AND WORK WIRELESS TELEGRAPHS IN SHIPS AND AIRCRAFT REGISTERED IN BRITISH INDIA.

1. Name of applicant (with Christian names in full)

Address

Age

Occupation

2. Is the applicant a British subject or subject of an Indian State? (Evidence of nationality and two written references as to character should be enclosed.)

3. Particulars of Ship for which a license is required:—

Name.	Owner.	Port of Registry.

4. Particulars of Aircraft for which a license is required:—

Name and/or No.	Type and Make.	Registered Marking.	Place of Registry.

5. Particulars of apparatus:—

(a) Transmitting.

(b) Receiving.

(c) If emergency set is installed.

* If more than one station is desired, details must be given for each station, including sketch of antenna, showing dimensions.

6. Power to be used for transmission (A) :—

- (a) Source (B)
 (b) Point where measured
 (c) Volts Amperes
 (d) D.C. or A.C.
 (e) Cycles per second (A.C.)
 (f) Maximum watts to be taken by transmitting instruments.

(A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.

(B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available, and if supply mains state voltage whether direct or alternating and periodicity.

7. Wavelengths it is desired to use :—

- (a) Spark or interrupted continuous wave.
 (b) Continuous wave.

8. Number and qualifications of Operators.	9. Class of Station under Radiotelegraph Convention, 1912.	10. Nature of service to be performed.

11. Hours of service

12. Name and address of person or persons by whom radiotelegraph accounts are settled.

CERTIFICATES OF INSPECTION.

(To be completed by a competent Wireless Telegraph Engineer.)

I hereby certify that I have inspected the installation described in this application and that the particulars given are correct.

Signature
 Occupation
 Address

Date

192

DECLARATION.

I undertake to observe the conditions of the license and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the license. I further declare that only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant.

Date

192

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless Branch), India.

Postage
 Stamps

SCHEDULE No.

ANNEXED TO

Fixed Station License, Registered No.
 Dated 192

1. Name of licensee.
 2. Address of licensee.
 3. Purpose for which station is licensed.
 4. Official name of station—Exact location. If movable, place in which station is normally located and area over which it is permitted to be moved.
 5. Call sign.
 6. The station is licensed as a (*) station, Class (†)
- (*) Here insert the "type" of station as shown in the table below.
 (†) Here insert the "class" of station as shown in the table below.

Type.	Class.	Apparatus allowed.	Communication allowed.
Limited-Commercial ..	I	Transmission and Reception	Morse, or Morse and Speech.
Ditto ..	II	Ditto	Speech only.
Ditto ..	III	Reception only	Morse and/or Speech.
Non-Commercial ..	I	Transmission and Reception	Morse and/or Speech.
Ditto ..	II	Reception only	Ditto.
Ditto ..	III	Transmission and Reception	Nil Apparatus NOT to be used with Antenna.

7. Antenna—

- (a) Description.
 (b) Height feet.
 (c) Horizontal length above ground feet.
 (d) Method of support.

8. Details of Apparatus—

- (a) Transmitting.
 (b) Receiving.

9. Wavelengths (metres)—

Normal transmitting wave
 Additional waves authorised
 Range of waves over which apparatus is capable of transmitting
 Normal receiving wave
 Additional waves authorised
 Range of waves over which apparatus is capable of receiving

10. Power—

- (a) Source
 (b) Point where measured
 (c) Volts Amperes
 (d) D.C. or A.C.

(e) Cycles per second (A.C.)

(f) Maximum watts to be taken by transmitting instruments.

11. The station is licensed to communicate with the following stations only :—

12. The provisions of clause 11 of this license do not apply to the following messages :—

13. Hours during which station may work (Indian standard time)—

- (a) Transmitting to
 (b) Receiving to

14. Certified operators—

15. Authorised charges for transmission and reception of messages—

(a) Messages on behalf of His Majesty's Government (centimes per word).

(b) Other messages (centimes per word).

16. List of documents to be kept at the station—

(a) Certified copy of the license and schedule.

Name.	Address.	Qualification.

(b) General Rules and Departmental Instructions for Radiotelegraph Stations in India.

(c) Post and Telegraph Guide (latest Indian edition).

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The day of 192 .

FIXED STATIONS.

Registered No.

Dated 192 .

IMPORT (WIRELESS TELEGRAPHS).

F Registered No.

Dated 192 .

TELEGRAPHS.

License to Import Apparatus for Wireless Telegraphs into British India.

I. In exercise of the power given him by Notification No. 6081, dated Simla, the 22nd October, 1921, issued under section 19 of the Indian Sea Customs Act, 1878 (VIII of 1878), and in exercise of all powers and authorities enabling him in this behalf, the Director-General of Posts and Telegraphs in India (hereinafter called the Director-General) hereby grants to

of (hereinafter called the licensee), during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 , when the license expires and becomes invalid unless renewed by endorsement thereon under the hand of the Director-General, license and permission to import such apparatus for wireless telegraphs (hereinafter called the licensed apparatus) as is specified in the schedule annexed hereto, or as may be specified in any supplemental license given from time to time under the hand of the Director-General, but subject to the provisions, stipulations and conditions set out in a *Bond* executed by the licensee in favour of the Secretary of State for India in Council on the date hereof in consideration for the granting of this license.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192 .

Signed by the licensee

in the presence of

The day of 192 .

SCHEDULE No. Annexed to
Import (Wireless Telegraphs) License, Registered
No. Dated 192 .

1. Name of licensee,

2. Address of licensee,

3. Places at which licensed apparatus may be imported.

4. Address of premises at which licensed apparatus may be kept.

5. Description of licensed apparatus to be imported.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The day of 192 .

Know all men by these presents that I of

hereby bind myself to the Secretary of State for India in Council (hereinafter called the Secretary of State) in the sum of Rs.

to be paid to the Secretary of State, his successors or assigns or his or their certain attorney or attorneys for which payment well and truly to be made I bind myself, my heirs, executors, administrators, and representatives firmly by these presents sealed with my seal in the Christian year one thousand nine hundred and

Whereas the above bounden (hereinafter called "the licensee") is desirous of importing apparatus for wireless telegraphs under section 19 of the Sea Customs Act, 1878.

And whereas by reason of the provisions of the said Act it is unlawful to import any apparatus for wireless telegraphs except under and in accordance with a license granted in that behalf by the Director-General of Posts and Telegraphs in India (hereinafter called the Director-General).

And whereas at the request of the licensee the Director-General has granted to the licensee by an instrument of license dated the same day as these presents a license under the said Act to import certain apparatus for wireless telegraphs on the licensee agreeing to observe and perform certain provisions, stipulations and conditions which are set out in the schedule hereto and to give a bond for the due observance and performance thereof.

Now the above-written obligation is entered into under the orders of the Government of India for the performance of an act in which the public are interested within the meaning of section 74 of the Indian Contract Act, 1872, and is conditioned to be void in case the licensee shall henceforth at all times perform and observe the said provisions stipulations and conditions in the said Schedule. Otherwise the same shall be and remain in full force.

THE SCHEDULE REFERRED TO
(being the provisions, stipulations and conditions to be observed and performed by the licensee in consideration for the said license being granted).

1. The said license is in all respects to be subject to the Rules and to all provisions of the Telegraph Act,

2. The licensed apparatus unless and until disposed of in accordance with the provisions hereinafter mentioned shall be kept at and in no other place without the written permission of the Director-General and shall not be used for or by the licensee or by any person either on behalf or by permission of the licensee for the purpose of establishing, maintaining or working a wireless telegraph except under and in accordance with a license granted in that behalf by the Director-General.

3. The licensee shall not assign, sell or otherwise dispose of the license or the licensed apparatus to any person except such person produces a valid license granted by the Director-General authorising such person to establish, maintain or work a wireless telegraph or to import apparatus for wireless telegraphs.

4. At the time of every transaction covered by the terms of section 3 hereof the licensee shall endorse upon the license of the person with or on behalf of whom the transaction is made:—

(a) The name, description and residence of the said person;

(b) The nature of the transaction and the character and quantity of licensed apparatus involved;

(c) The date of the transaction; and shall sign the endorsement and shall himself keep a copy of every such endorsement and produce it to the Director-General or agent authorised on demand.

5. The licensee shall immediately give information of all transactions in licensed apparatus to the Director-General and in such manner as the Director-General may direct.

6. (1) The licensee shall maintain registers of all licensed apparatus which he imports and of all disposals of the same, in such form as the Director-General may direct.

(2) He shall exhibit his stock and his registers on the demand of the Director-General or any agent authorised in that behalf in writing by him, or of any Magistrate, or any police officer of a rank not below that of Inspector.

7. The licensee shall forthwith give information to the nearest police station and to the Director-General of the loss or theft of any licensed apparatus.

8. The licensee shall at all times indemnify the Government of India against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. The licensee shall pay to the Director-General for and in respect of the license granted a fee of Rs. 10 per annum. The said fee shall be payable before the issue of the license and the fee payable upon renewal of the license shall be payable before such renewal, but the Secretary of State shall not be bound to renew the license and any renewal thereof shall be revocable by him at any time.

10. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the licensed apparatus it shall be lawful for the Director-General or any other officer specially authorised by him to cause the licensed apparatus or any premises, gear or plant connected therewith or any part thereof to be taken possession of in the name and on behalf of the Governor-General in Council and to be used for the service of the Government and subject thereto for such ordinary services as to the said officer may seem fit and in that

event may enter any premises in which any such apparatus is kept and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such person as he may think fit to assume control of the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may accordingly enter any premises in which such licensed apparatus is kept.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

11. The Director-General may at any time by notice in writing and without assigning any reason revoke and determine the said license or any extension thereof and each and every of them shall absolutely cease, determine and become void without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any conditions or provision herein contained, but these presents shall remain in force as regards apparatus already imported or otherwise so far as the same are applicable and capable of taking effect.

12. Any notice, request, consent (whether required to be in writing or not) or act whatsoever to be given by the Secretary of State, the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General and may be served by sending the same by registered post letter to the licensee at the address as given in the license or these presents and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General.

13. (1) In these presents the following words and expressions shall have the several meanings hereinafter assigned to them unless there is something either in the subject or context repugnant to such construction (that is to say):—

(2) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885) as amended by the Indian Telegraph (Amendment) Act, 1914 (VII. of 1914) or any future amendment or re-enactment thereof.

(3) "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for making, transmitting or receiving telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

(4) "Wireless telegraph" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(5) "Sea Customs Act" means the Indian Sea Customs Act, 1878 (VIII of 1878) or any statutory modification or re-enactment thereof for the time being in force.

(6) "Import" means bringing by sea or by land into British India.

(7) "Rules" means the Rules made from time to time under the Telegraph Act.

(8) "License" means the license to import given in consideration of these presents or any extension or renewal thereof for the time being in force.

14. The licensee shall not import any apparatus or other thing whatsoever connected with wireless telegraphs except what is specified

(a) To establish, maintain and work, apparatus for wireless telegraphs (hereinafter called the licensed apparatus) at the places (or within the area) specified in the schedule annexed hereto (hereinafter called the stations), and at such other places as may be specified in any supplemental license given from time to time under the hand of the

Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental license as aforesaid;

(ii) If employed for transmission, shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided, further, that the licensed apparatus employed for reception shall be used in such a manner as to cause no interference with other stations;

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and such other wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs;

(iv) If employed for the transmission and reception of messages, shall admit of such transmission and reception at the rate of not less than 20 words a minute, five letters being counted as one word;

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated by valves or other apparatus generating pure continuous waves, and the power to be employed for this purpose shall not exceed 100 watts, measured in the case of valves in the anode circuit, and in the case of high-frequency alternators at the input terminals of the alternator;

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and such other stations specified in the schedule annexed hereto. Provided that the transmission and reception of messages from and at the said stations shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time—

(c) (i) In the case of a station licensed for limited-commercial purposes, to receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus.

(ii) In the case of a station licensed for non-commercial purposes, no money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus or any part thereof.

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs in British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said license and permission is granted subject to the provisions of the Telegraph Act, and on and subject to the following further conditions and provisions:—

visions of the Telegraph Act, and on and subject to the following further conditions and provisions:—

RESTRICTION ON USE OF APPARATUS.

3. (1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this license.

(2) In the case of limited-commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Director-General of Posts and Telegraphs may prescribe that the stations must accept such messages and communicate with such stations as may be designated. In this event the licensee shall be entitled to collect a charge for the handling of such public correspondence, the amount of such charge to be as approved by the Director-General of Posts and Telegraphs.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far as they are consistent with the other provisions of this license, and for the purposes of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not, by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling, the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

AS TO INTERFERENCE.

6. (1) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

(2) The licensee shall so work the licensed apparatus as not to interfere with—

(a) The working of any fixed stations established in British India or the territorial waters abutting on the coast of British India

by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or any Indian State, or for commercial purposes;

(b) The transmission or reception of any messages between or at land stations and mobile stations.

STATIONS WITH WHICH LICENSED APPARATUS MAY COMMUNICATE.

7. Except as specified in clause 16, the licensed apparatus shall not be used for communicating with any stations whatsoever other than those specified in the schedule annexed hereto.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.—PROTECTION OF OPERATORS.

8. The licensed apparatus shall not, without the consent in writing of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the places mentioned in the schedule annexed hereto or in any such supplemental license as aforesaid.

(2) The licensee shall keep the licensed apparatus, and in particular the head gear receivers thereof, in a clean and sanitary condition.

(3) The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

AS TO WORKING TRANSMITTING APPARATUS.

9. (1) When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules. On such occasions a certified operator shall listen on suitably adjusted receiving apparatus for three minutes, at periods not exceeding fifteen minutes, in order that he may perceive if the licensed apparatus is causing interference to authorised wireless communication. On being requested by any Government of India, Naval, Military, or Air Force station, to cease transmission the licensee shall comply immediately, and shall refrain from further transmission as long as may be required.

(2) When employed to radiate waves the call sign of the transmitting station and that of the receiving station (if any) shall be signalled or spoken at the commencement and conclusion of every transmission.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands, which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee, and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India, or by any licensee of the Government of India (other than the licensee), and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs, or any agent authorised in that behalf in writing by him, may at all reasonable times enter all or any of the said stations either solely or jointly with any other person or persons for the purpose of inspecting, and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this license or a copy of this license certified by the Director-General of Posts and Telegraphs shall be produced by the licensee or the person for the time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this license for each of the stations herein licensed.

LICENSE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the license under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy and also such documents as may be prescribed by the Director-General of Posts and Telegraphs, and as mentioned in the schedule annexed hereto.

FEE FOR LICENSE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the license hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the license, and the fee payable upon the renewal of the license shall be payable before such renewal.

ROYALTY FOR LICENSED APPARATUS.

(3) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the license hereby granted a royalty of Rs. _____ per annum in respect of each station at which the licensed apparatus is installed.

(4) The said royalty shall be payable before the issue of the license, and the royalty payable upon the renewal of the license shall be payable before such renewal.

LICENSE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs, the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licenses, powers and authorities hereby granted, or any of such licenses, powers or authorities.

SIGNALS OF DISTRESS.

16. The licensee shall, so far as possible, receive all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

AS TO INTERFERENCE WITH TELEGRAPHS, TELEPHONES AND POWER CIRCUITS AND APPARATUS.

17. (1) All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not either directly or by

reason of the working or uses thereof to interfere with the efficient or convenient maintenance, working or uses of any telegraph line of the Director-General of Posts and Telegraphs which may from time to time exist, or, which it is probable, that the Director-General of Posts and Telegraphs may have occasion to erect, place, fix or use, or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or uses thereof.

(2) In case any telegraph line of the Government of India shall be damaged or the efficient working or uses thereof shall be wholly or partially interrupted or otherwise interfered with, and the Director-General of Posts and Telegraphs shall certify in writing under his hand, that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee, or by any electric circuit used or intended to be used, or by anything done by or on behalf of the licensee in relation thereto, the licensee shall on demand pay to the Government of India all costs that shall be reasonably incurred in repairing such damage, and in removing or altering such telegraph line so as to restore the same to efficient working order, and in adding thereto or substituting therefor, either temporarily or permanently, any other telegraph line if the Director-General of Posts and Telegraphs shall certify that such addition or substitution is reasonably required by reason of such interruption or interference. Should the Director-General of Posts and Telegraphs consider that in the interests of the Government of India it is desirable that the position or circuit of the licensed apparatus be altered he may, instead of having the telegraph circuit altered or removed, order the licensee to alter or remove the licensed apparatus or circuit.

(3) The licensee shall provide against—

(a) The disturbance of the receiving apparatus of any fixed stations by electromagnetic waves of any frequency or by conduction currents, emitted from the licensed apparatus.

NOTE.—For the purpose of this provision the term “disturbance” is defined as the “production of appreciable electrical effects in a syntonised receiver, other than the receiver of the licensed apparatus, adjusted as a whole to a wavelength different from that of the transmitter of the licensed apparatus.”

(b) Interference with power, telegraph, telephone lines or cables in which high potential currents might be induced by means of the licensed apparatus.

(4) In the case of licensed apparatus which is not permitted to be used with an antenna, the licensee shall ensure that the station will not radiate waves, and that the effects of conducted waves or earth currents of any frequency or nature emitted by the licensed apparatus shall not be appreciable on any telegraph or power system.

POWER TO TAKE POSSESSION OF OR CONTROL LICENSED APPARATUS UPON EMERGENCY.

18. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject

thereto for such ordinary services as to the said officer may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may, in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such person as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly, and in such manner as he may direct and such persons may accordingly enter any station in which any such apparatus is installed, and assume such control or the said officer may direct the licensee to submit to him or any persons authorised by him all messages tendered for transmission or received by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission or reception of any messages, or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission or reception of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause the Director-General of Posts and Telegraphs may immediately thereupon cancel the license without the licensee being entitled to any compensation and without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of such licensed apparatus or to claim damages.

PROVISIONS FOR DETERMINATION OF LICENSE.

19. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and each and every of them, as to all or any of the stations hereby licensed, and thereupon these presents and the said licenses, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said stations (as the case may be) without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

LICENSE NOT TO AFFECT RIGHTS OF GOVERNOR-GENERAL IN COUNCIL.

20. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish, extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such

terms as he shall in his discretion think fit and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraph Act.

NOTICES, ETC.

2r. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same by registered post letter to the licensee at the address as given in the license, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192

Signed by the licensee

in the presence of

The day of 192

MOBILE STATIONS.

Registered No.

Dated 192

TELEGRAPHS.

License to establish, maintain and work Wireless Telegraphs in Ships and Aircraft registered in British India.

INTERPRETATION CLAUSE.

1. (1) In these presents (and in the schedule annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject of context repugnant to such construction (that is to say)—

(2) "Station" means any apparatus for wireless telegraphs erected for the purpose of transmitting or receiving messages or signals, whether with or without antenna.

"Fixed stations" means stations established on land (or on board any ship permanently moored).

"Land stations" means fixed stations established for service with mobile stations, the term being used only in respect of their service with mobile stations. They are further subdivided into—

(a) "Coast stations" which are those utilised for communication with ships at sea;

(b) "Aviation stations" which are those utilised for communication with aircraft in flight.

(3) "Non-commercial stations" means fixed stations established for the purposes of research, experiment or instruction and which are operated by the licensee solely with a view to the advancement of the art of wireless telegraphy.

"Limited-commercial stations" means fixed stations established in connection with the business of the licensee or for carrying the private or business correspondence of the licensee.

(4) "Mobile stations" means ship stations and aircraft stations.

"Ship station" means a station established on board a ship which is not permanently moored.

"Aircraft station" means a station established in any balloon, whether fixed or free, airship or flying machine.

(5) "Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India for the time being.

(6) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885) as amended by the Indian Telegraph (Amendment) Act, 1914 (VII of 1914).

(7) "Telegraph" has the same meaning as in the Telegraph Act.

(8) "Wireless telegraph" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(9) "Rules" means the rules made from time to time under the Telegraph Act.

(10) "International Telegraph Convention," "International Telegraph Regulations," and "Radiotelegraph Convention, 1912," mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder; the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and include respectively any modification of the said Conventions or Regulations made from time to time.

(11) "To radiate waves."—Apparatus shall be deemed to "radiate waves" when the transmitting apparatus is so arranged that it emits electro-magnetic waves which can be detected by a wireless telegraph receiving apparatus situated at a distance not exceeding 400 yards.

(12) "Service signalling" means signalling by means of any system of wireless telegraphs between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval, Military or Air Forces.

(13) "Certified operator" means a person who is in possession of a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs or by the proper authority in the United Kingdom, or in any British Possession or Protectorate.

2. (1) Whereas

of

(hereinafter called the licensee) is desirous of establishing, maintaining and working in the ships and aircraft registered in British India specified in the schedule annexed hereto a wireless telegraph under section 4 of the Telegraph Act for the sole purpose stated in the schedule annexed hereto;

(2) And whereas, it is unlawful to establish, maintain or work any wireless telegraph in any ship or aircraft registered in British India except under and in accordance with a license granted in that behalf by the Director-General of Posts and Telegraphs;

(3) And whereas at the request of the licensee the Director-General of Posts and Telegraphs has agreed to grant to the licensee under the power conferred by the said Act, the licenses, powers and authorities hereinafter expressed and contained for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing;

(4) Now these Presents witness that the Director-General of Posts and Telegraphs in exercise of all powers and authorities enabling him in this behalf hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192, when (the license becomes invalid unless renewed by endorsement thereon under the hand of the Director-General of Posts and Telegraphs), license and permission:

(a) To establish, maintain and work apparatus for wireless telegraphs (hereinafter called the licensed apparatus) in the ships and aircraft specified in the schedule annexed hereto (hereinafter called the stations) and in such other ships and aircraft as may be specified in any supplemental license given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental license as aforesaid;

(ii) If employed for transmission shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided further, that the licensed apparatus employed for reception shall be used in such a manner as to cause no interference with other stations.

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and other such wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs;

(iv) Shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute, five letters being counted as one word.

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated—

In the case of ship stations by spark, interrupted continuous wave (*i.e.*, "tonic train" or "modulated by abrupt interruption") or valves or other apparatus generating pure continuous waves;

In the case of aircraft stations by interrupted continuous wave or valves or other apparatus generating pure continuous waves and the power to be employed shall not exceed 100 watts, measured in the case of valves in the anode circuit and in the case of high frequency alternators at the input terminals of the alternator;

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and land stations and other mobile stations. Provided that the transmission and reception of messages from and at the said stations when in Indian territorial limits shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time;

(c) To receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the said apparatus;

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs into British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said license and permission is granted subject to the pro-

visions of the Telegraph Act and on and subject to the following further conditions and provisions—

RESTRICTION ON USE OF APPARATUS.

3. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this license.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. (1) The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far as they are consistent with the other provisions of this license. In the case of licenses for aircraft stations the expressions "ship" and "ship stations" in the Convention being read as if "aircraft" and "aircraft station" were substituted therefor.

(2) For the purposes of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling, the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

AS TO INTERFERENCE.

6. The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.

7. The licensed apparatus shall not, without the consent in writing of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the ships or aircraft mentioned in the schedule annexed hereto or in any such supplemental license as aforesaid.

PROTECTION OF OPERATORS.

8. (1) The licensee shall keep the licensed apparatus and in particular the head gear receivers thereof in a clean and sanitary condition.

(2) The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

CERTIFIED OPERATORS TO WORK TRANSMITTING APPARATUS.

9. When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules, or of any rule made under the Indian Wireless Telegraphy (Shipping) Act, 1920.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than the properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or by any licensee of the Government of India (other than the licensee) and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs or any agent authorised in that behalf in writing by him may at all reasonable times enter all or any of the said stations either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this license or a copy of this license certified by the Director-General of Posts and Telegraphs shall be produced by the licensee of the person for the time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this license for each of the stations herein licensed.

LICENSE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the license under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy, and also such documents as may be prescribed by the Director-General of Posts and Telegraphs and as mentioned in the schedule annexed hereto.

FEE FOR LICENSE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the license hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the license and the fee payable upon the renewal of the license shall be payable before such renewal.

LICENSE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licenses, powers and authorities hereby granted, or any of such licenses, powers or authorities.

MESSAGES TO BE TRANSMITTED WITHOUT FAVOUR OR PREFERENCE.

16. Subject to the provisions of this license and of the rules, the licensee shall transmit and receive messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise.

SIGNALS OF DISTRESS.

17. The licensee shall so far as possible receive all requests for assistance and all signals of distress, and shall answer such requests and signals, and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

ACCOUNTS, RECORDS, ETC.

18. (1) The licensee shall keep full accounts, records and registers of all messages transmitted or received by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Director-General of Posts and Telegraphs shall from time to time reasonably require to be shown, messages on the service of the Government of India being distinguished from other messages in such registers.

(2) The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least 15 months counting from the month following that in which the radiotelegram were handed in as prescribed by the Radiotelegraph Convention, 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Director-General of Posts and Telegraphs or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

(3) The licensee shall render to the Director-General of Posts and Telegraphs such accounts as the latter may from time to time direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the stations hereby licensed and land stations, and shall pay to the Director-General of Posts and Telegraphs at such times and in such manner as the latter may direct all sums which shall be due from the licensee in accordance with such accounts.

POWER TO TAKE POSSESSION OF OR CONTROL

LICENSED APPARATUS UPON EMERGENCY.

19. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall

be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear, or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject thereto for such ordinary services as to the said officers may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus, and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such person as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may accordingly enter any station in which any such apparatus is installed and assume such control or the said officer may direct the licensee to submit to him or any persons authorised by him all messages tendered for transmission or received by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission or reception of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission or reception of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause, the Director-General of Posts and Telegraphs may immediately thereupon cancel the license without the licensee being entitled to any compensation, and without prejudice to any steps the Governor-General in Council may think fit to take, to obtain possession of such licensed apparatus or to claim damages.

PROVISIONS FOR DETERMINATION OF LICENSE.

20. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason revoke and determine these presents and the licenses, powers and authorities herein before granted, and each and every of them as to all or any of the stations hereby licensed, and thereupon these presents and the said licenses, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said stations (as the case may be), without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

LICENSE NOT TO AFFECT RIGHTS OF GOVERNOR-GENERAL IN COUNCIL.

21. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish, extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant licenses

to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraph Act.

NOTICES, ETC.

22. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same by registered post letter to the licensee at the address as given in the license, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The _____ day of _____ 192.
Signed by the licensee

in the presence of

The _____ day of _____ 192.

SCHEDULE No. _____ ANNEXED TO MOBILE STATION LICENSE, REGISTERED No. _____

Dated _____ 192.

1. Name of licensee.
2. Address of licensee.
3. Purpose for which station is licensed—
Communication with land and mobile stations.
4. Name of ship or number of aircraft—
In which station is established.
5. Port or place of registry.
6. Particulars of apparatus—
 - (a) Transmitting.
 - (b) Receiving.
 - (c) If emergency set is installed.
7. Power—
 - (a) Source.
 - (b) Point where measured.
 - (c) Volts, amperes.
 - (d) D.C., or A.C.
 - (e) Cycles per second (A.C.).
 - (f) Maximum watts to be taken by transmitting instruments.
8. Authorised wavelengths (metres). See note. Spark, 300, 600, 1,800. C.W.
9. Number and qualification of operators.
10. Class of ship station under Radio-telegraphic Convention, 1912.
11. Nature of services performed.
12. Hours of service.
13. Authorised charges for transmission and reception of messages—
 - (a) Messages on behalf of His Majesty's Government (centimes per word).
 - (b) Other messages (centimes per word).
14. Name and address of person or persons by whom radiotelegraph accounts are settled.
15. List of documents to be kept at the station—
 - (a) Certified copy of the license and schedule;

(b) General Rules and Departmental Instructions for Radiotelegraph Stations in India.

(c) Post and Telegraph Guide (latest Indian edition).

(d) International List of Radiotelegraph Stations.

(e) Liste Alphabétique des Indicatifs d'Appel.

AUTHORISED WAVELENGTHS.

In the case of ship stations, the licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres. The licensed apparatus may be so constructed as to use any of the other wavelengths specified or any wavelengths specified or any wavelengths prescribed by any administration for communication with direction finding stations. Provided always that the wavelength of 1,800 metres may be used for transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912.

In the case of aircraft stations, the licensed apparatus shall be so constructed as to be capable of using waves of 600 metres (hereinafter referred to as the "aircraft ship wave") and 900 metres (hereinafter referred to as the "aircraft normal wave"). It may also be constructed so as to be capable of using the other waves specified as "optional waves." Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres it must always be capable

of using 2,400 metres continuous wave. Provided further that the waves before referred to shall not be used without the written permission of the Director-General.

The use of the aircraft ship wave shall be confined to the system known as "interrupted continuous" wave (i.e., "tonic train" or "modulated by abrupt interruptions") save in the case of great emergency, when if the use of this system is impracticable this wave may be used for the transmission and receipt of spoken messages. The aircraft normal wave shall be used only for the purpose of transmitting spoken messages or for continuous waves.

The transmitting apparatus may be so constructed as to be capable of varying the wave emitted by an amount not exceeding 3 per cent. above and below the wave in use. Provided always that such variation from the normal wave shall only be employed when first calling, when communication has not been established when first calling, or in case of distress.

The receiving apparatus may be so constructed as to receive waves of any length, but it shall be constructed so as to receive the aircraft ship and aircraft normal waves. Provided always that if the transmitting apparatus is capable of using the waves mentioned above the receiving apparatus shall be so constructed as to be capable of receiving these waves.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The day of 192

BRITISH NORTH BORNEO

(See also Map, Section)

Including : Sarawak and Brunei.

THE territory of Sarawak, a British Protectorate, comprises an area of about 42,000 square miles, with a population of about 600,000, composed of various races. It is situated on the north-west coast of the Island of Borneo, is intersected by many rivers, some of which are navigable for a considerable distance inland, and commands about 400 miles of coast line.

British North Borneo occupies the northern part of the Island of Borneo. The interior is mountainous, Mount Kinabalu being 13,455 feet high, but most of the surface is jungle. Total area 31,106 square miles ; population 208,183.

This territory is under the jurisdiction of the British North Borneo Company, being held under grants from the Sultans of Brunei and Sulu. (Royal Charter in 1881). The territory is administered by a Governor (appointed with the approval of the Secretary of State) in Borneo and a Court of Directors in London, appointed under the Charter. On May 12th, 1888, the British Government proclaimed a formal protectorate over the State of North Borneo.

The Administration is conducted by the Rajah, Charles Vyner Brooke, assisted by a Supreme and a General Council. The Civil Service is composed of British officers selected by the Rajah.

SARAWAK

CONTROL.

The Radiotelegraph and Telephone Department is a separate unit from the Post Office, and is in the sole charge of the manager, who deals in all matters relating to the wireless telegraph and telephone service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
J. R. Barnes	Manager	Kuching.
A. D. Taylor	Operator i/c Miri Station	Miri
P. E. Cox	Assistant	Kuching
G. S. Were	Senior Operator	—
H. G. Gray	" " " "	—
J. P. Anderson	Assistant	—

Assisted by a native staff of 15 operators, 3 clerks and 5 mechanics.

ORGANISATION.

Radio communication was instituted by the Government for public and official use in April, 1917. The chief station is at Kuching, the capital of Sarawak. Sub-stations are situate at Miri, Sibü, Sadong and Goebilt. The "Compagnie Général de Radiotélégraphie, Paris," system is employed throughout, except at Goebilt, which was constructed locally by the department.

There are two experimental stations; other experimental stations are allowed, provided the transmitter wavelength does not exceed 400 metres.

Since April, 1922, two C.W. and telephone transmitters with a wavelength of 2,200 metres have been on trial with satisfactory results, and speech and music have been clearly transmitted to Singapore and the Sarawak inland stations. Seven more of these will be erected early in 1923. The system will be as follows:—

Station.	Installation.	Power.	Wavelength.
Kuching	Quenched spark	8 kW.	600 metres.
		4.75 kW.	1,000 "
			1,500 "
			1,800 "
			2,800 "
			3,200 "
Miri	Spark Coil		600 "
	CW and Telephony and I.C.W.	75-150 W.	2,200 "
	Quenched Spark	4.75 kW ..	600 "
			1,800 "
Sibü	CW. and Telephony	75-150 W.	
	Quenched Spark	4.75 kW. ..	600 "
Sadong			1,800 "
	CW. and Telephony	75-150 W.	
Goebilt	Quenched Spark	0.5 kW. ..	600 "
	CW and Telephony	50-100 W.	
	Spark coil		600 "
Bintulu	CW. and Telephony	50 W.	
Dalat	CW and Telephony	75-150 W.	
Simanggang	" " " "	" " " "	—
Selalang	" " " "	" " " "	—
Proposed Stations {	Limbang	" " " "	—
	Baram	" " " "	—
	Kapit	" " " "	—

ADMINISTRATION.

There are no regulations obliging ships trading in Sarawak waters to be fitted with wireless.

The following are the Regulations relating to wireless in the Protectorate of Sarawak.

A—Wireless Telegraphy Order, 1921.

ORDER, No. XIX, 1921.

A 1. This Order may be cited as the "Wireless Telegraphy Order, 1921," and shall come into force upon the publication thereof in the *Government Gazette*.

2. (i) In this Order the expression "Wireless Telegraphy" means any system of communication by telegraph or telephone without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(ii) Nothing in this Order shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. His Highness the Rajah, whenever he shall deem it expedient so to do, may license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Sarawak or on board any ship registered in Sarawak.

4. (i) No person shall erect or establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in Sarawak except under and in accordance with a license granted by His Highness the Rajah.

(ii) Every such license shall be in such form and for such period as His Highness the Rajah may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as His Highness the Rajah shall consider desirable in the public interest.

5. (i) If any person erects or establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Order except with the previous sanction of His Highness the Rajah.

(ii) On being satisfied by information that there is reasonable ground for believing that a wireless telegraph station has been erected or established without a license in that behalf,

or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, a Judge of the Supreme Court or Police Magistrate or District Officer may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. The regulations in the schedule to this Order shall have effect except in so far as they may be amended or rescinded by further regulations made by His Highness the Rajah for carrying into effect the purposes of this Order.

7. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Order or of any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against this Order, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Order or any regulations made thereunder, may be had and recovered before a Resident's Court.

THE SCHEDULE.

(1) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the State shall be worked in such a way as not to interfere with the working of any wireless telegraphy station lawfully established, installed or worked in the State or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any harbour of the State except with the special or general permission of His Highness the Rajah.

(3) These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

By Order of His Highness the RAJAH.

BRITISH NORTH BORNEO.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPH OPERATORS.

Official.	Title.	Address.
Mr. C. F. Newton Wade, A.M.I.R.E.	Postmaster-General and Superintendent of Telegraphs	Jesselson.
Mr. H. A. Dabell	Assistant Postmaster and Assistant Super- intendent of Telegraphs	Sandakan.

ORGANISATION.

Radiotelegraph intercommunication is maintained by four 5-kilowatt Government stations situated at Jesselson, Sandakan, Kudat and Tawau respectively. The Siemens Quenched Spark system is employed throughout. The Sandakan station was the first erected in the State and completed in October, 1913. The conditions of working are, as in most tropical countries,

not altogether good, owing to the strong electrical disturbances and the mountainous country which is covered with dense jungle. The four stations have, however, maintained an uninterrupted day service since their erection.

ADMINISTRATION.

Wireless telegraphy is administered in accordance with the provisions of the following ordinance:—

A—Wireless Telegraphy Proclamation, 1914.

WIRELESS TELEGRAPHY PROCLAMATION, 1914.

A British North Borneo has been included as a party in the International Radiotelegraphic Convention.

The following proclamation controls the use of wireless telegraphy:—

1. This proclamation may be cited as "The Wireless Telegraphy Proclamation, 1914," and shall come into force upon the publication thereof in the *Gazette*.

2. (i) In this proclamation the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Proclamation, 1901," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government or by bodies corporate established under and subject to the laws of this State, and having their principal place of business within this State.

(ii) Nothing in this proclamation shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in this State or on board any locally owned ship.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in this State or on board any locally owned ship except under and in accordance with a license granted in that behalf by the Governor.

(ii) Every such license shall be in such form and for such periods as the Governor may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (i) Any person establishing a wireless telegraphy station without a license in that behalf, or installing or working any apparatus for wireless telegraphy without a license in that behalf, shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, provided that no proceedings shall be taken against any person under the proclamation except with the previous sanction of the Governor.

(ii) On being satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf,

a magistrate may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor may make and, when made, vary or cancel rules more particularly for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licenses under the proclamation are to be made;

(b) For prescribing the fees payable on the grant of any license;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, in the waters of this State shall be worked so as to prevent the interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in this State or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Superintendent of Telegraphs, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, whilst such ship is in any of the harbours of this State;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships or British or foreign ships, in the waters of this State, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, either in all cases or in such cases as may be deemed desirable;

(f) And generally for the more effectual carrying out of the provisions of this proclamation.

(ii) No rules made in respect of the matters described in paragraphs (c), (d), and (e) of sub-section (i) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. On an application for a license proving to the satisfaction of the Governor that the whole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted to such applicant, subject to such special terms, conditions, and restrictions as the Governor may think proper that such license shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with, and every act done or attempted to be done contrary to, the provisions of the proclamation, or of any rule made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against, not otherwise specially provided for, the

offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(ii) All convictions, forfeitures, and fines under this proclamation, or any rules made thereunder, may be had and recovered before the Court of a Magistrate of the First Class.

BRITISH SOMALILAND (Protectorate)

(See also Map Section)

THE Somali coast, lying south of the Red Sea, and stretching from Lahadu to Bandar Ziyada (49° east longitude), is administered by a British Governor. Egyptian control ceased in 1884, and the territory then fell under the administration of the Indian Government. It was taken over by the Foreign Office on October 1st, 1898, and was transferred to the Colonial Office on April 1st, 1905. The area comprises about 68,000 square miles, which support a population of about 300,000 Mohammedans.

CONTROL.

The control of wireless telegraph operations is vested in the Posts and Telegraphs Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. C. R. Keyte	Director of Posts and Telegraphs	Berbera.
Mr. C. V. Magill	Assistant Director of Posts and Telegraphs ..	Do.
Mr. A. J. S. Culpeper ..	Superintendent of Telegraphs	Do.
Mr. O. L. Day	Electrical Mechanic	Do.

ORGANISATION.

Originally radiotelegraphy was introduced, and the Protectorate placed in telegraphic communication with the outside world, more with a view to administrative than commercial purposes. The first stations were erected in 1910 at Berbera and Aden (on the Asiatic coast), the latter being in telegraphic communication with the Eastern Telegraph Company's Aden Station. Subsequently other stations were erected, at Bulhar (1913), at Burao (1916), at Las Dureh (1918), and at Hargeisa (1919).

Bulhar and Las Dureh stations have been temporarily closed.

Mobile stations are in use at Zeila and Las Khorai on the coast.

The latest available statistics enumerate: Six land stations (including Aden) (fixed) directly controlled by Government, and one portable land station (a $\frac{1}{2}$ kW. camel pack set) also under Government control. Internal communication is on a 900-metre wave to avoid interference in the Gulf of Aden.

ADMINISTRATION.

The first Ordinance to regulate radiotelegraphy in the Somaliland Protectorate was passed in 1908. It was called Ordinance No. 6 of 1908 and enacted that the full control of radiotelegraphy should be vested in the Commissioner, and any person contravening his regulations should be liable on conviction to a fine not exceeding £100 or imprisonment for 12 months, together with confiscation of his apparatus. A new Ordinance repealing the above was passed in 1913, and appears *in extenso* below. This constitutes the extant governing decree under which wireless is at present administered.

We append the text of the following:—

- A—Wireless Telegraphy Ordinance, 1913.
B—Regulations thereunder.

ORDINANCE.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which messages or other communications are sent or received. Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Protectorate, except under and in accordance with a license granted in that behalf by the Commissioner.

(2) Every such license shall be in such form and for such period as the Commissioner may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Protectorate, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Commissioner may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication have the same effect as if enacted in this Ordinance.

(2) The regulations in the schedule to this Ordinance shall have effect in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Protectorate shall be subject to such further regulations as may be made by the Commissioner from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search-warrant to any Police Officer or any person appointed in that behalf by the District Commissioner and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the

station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to fine not exceeding rupees seven hundred and fifty, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the District Court, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphs Ordinance, 1908, is hereby repealed.

SCHEDULE.—SECTION 5 (2).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Protectorate shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Protectorate or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless stations established on ships at sea.

ii. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Protectorate, except with the special or general permission of the Commissioner.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BRITISH WEST INDIES

(See also Map Section)

Including: Bahamas, Barbados, Jamaica (Cayman Islands, Morant Cays, Pedro Cays, Turks and Caicos Islands), Leeward Islands (Antigua,

Montserrat, St. Christopher—St. Kitts and Nevis—with Anguilla, the British Virgin Islands, Sombbrero, Dominica), Trinidad (with Tobago), Windward Islands (Grenada, St. Vincent, St. Lucia).

BAHAMAS

THE Bahamas (or Lucayos) are an archipelago of the British West Indies, lying between $21^{\circ} 42' - 27^{\circ} 34'$ N. lat. and $72^{\circ} 40' - 79^{\circ} 5'$ W. long., and extending from the coast of Florida on the north-west to Haiti on the south-east. They have an area of 4,404 square miles, and a population of 53,031.

CONTROL AND ORGANISATION.

In 1921 a scheme of linking up the out-islands of the Colony with Nassau by radiotelegraphy was started and stations were installed on the Islands of Eleuthera, Bimini, Harbour-Island and Inagua. Funds have been provided by the Legislature for additional stations to be erected in 1922 to be located, two on the large island of Abaco, and one on Grand Bahama Island.

All land stations are controlled by the Governor in Council.

There are no time, meteorological, hydrographic or press services or direction finding stations.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
P. H. Burns	Superintendent and Electrical Engineer ..	Nassau.

ADMINISTRATION.

The Radiotelegraph Act, 1913, regulates the administration of wireless telegraphy.

A—Radiotelegraphic Act, 1913.

B—Rules made thereunder.

3 AND 4 GEORGE V, CHAPTER 7.

AN ACT

FOR ESTABLISHING RADIOTELEGRAPHIC COMMUNICATION IN THE COLONY AND BETWEEN THE COLONY AND PARTS BEYOND THE LIMITS OF THE COLONY.

(Assented to 7th July, 1913.)

A May it please the King's Most Excellent Majesty that it may be enacted and be it enacted by His Excellency George Basil Haddon-Smith, Esquire, Companion of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Bahama Islands, the Legislative Council and Assembly of the said Islands, and it is hereby enacted and ordained by the authority of the same as follows:—

1. This Act may be cited as the Radiotelegraph Act, 1913, and together with "the Telegraph Act, 1891" and the Acts amending the same, may be cited as the Telegraph Acts, 1891 to 1913.

2. In this Act unless the context otherwise requires:—

"Rules" means Rules made under this Act.

"Superintendent" means the Superintendent of Telegraphs and Electrical Engineer.

3. (1) It shall be lawful for the Governor in Council—

(a) To make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in New Providence for radiotelegraphic communication between New Providence and other parts of the Colony and parts beyond the limits of the Colony and for such purpose to make and enter into

any contract as may be requisite: The contract entered into on the 3rd day of December, 1912, between the Crown Agents for the Colonies acting for and on behalf of the Government of the Colony, and the Anglo-French Wireless Telegraph Company, Ltd., shall be deemed to be a contract entered into under the provisions of this Act.

(b) With any funds that may hereafter from time to time be specifically granted by the Legislature for the purpose to make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in any Out Island for radiotelegraphic communication between such Out Island and any other parts of the Colony and parts beyond the limits of the Colony, and for such purpose to make and enter into any contract as may be requisite.

(c) To grant licenses for the erection, construction, establishment or maintenance of instruments or apparatus for the purpose of transmitting or receiving messages within the Colony and across the seas by means of radiotelegraphy and for the transmission or reception of any such messages. Any license granted under this Act shall be subject to such conditions and restrictions as the Governor in Council may prescribe.

(d) To make rules—

(i) for the proper and efficient working of any radiotelegraph station from time to time established under this Act;

(ii) fixing the rates and charges for the transmission of messages thereby;

(iii) regulating the conditions under which messages may be transmitted;

(iv) prescribing the duties of the operators and probationers employed at any such station;

(v) for controlling the user of any instruments or apparatus erected, constructed, established or maintained under a license granted under this Act and the transmission or reception of any messages thereby;

(vi) for the training and examination of probationers;

(vii) for obtaining secrecy on the part of all persons employed in or in any way connected with the maintenance and working of any radiotelegraph station established under this Act and prescribing the form and nature of any oath of secrecy to be taken by any such persons; and

(viii) generally for fully carrying into effect the objects of this Act.

(2) All radiotelegraph stations established under sub-sections (a) and (b) of sub-section (1) of this section shall be under the control of the Governor in Council.

4. It shall be lawful for the Governor, when in his opinion an emergency has arisen in which it is expedient for the public service that His Majesty should have control over the transmission and reception of messages to or from any radiotelegraph station in the Colony, to take possession of and assume control of any radiotelegraph station in the Colony to be used for His Majesty's service and subject thereto for such ordinary service as may seem fit, or to direct and authorise such persons as he thinks fit to assume the control of the transmission and reception of messages either wholly or partly and in such manner as he directs.

5. (1) Whosoever shall unlawfully and maliciously cut, break, throw down, destroy, injure, remove or in any way interfere with any battery, machinery, wire, mast, post or other matter or thing whatsoever being part of, or being used or employed in or about any radiotelegraph station under this Act or in the working thereof shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for five years.

(2) Whosoever shall unlawfully or maliciously in any manner whatsoever prevent or obstruct the sending, conveying or delivery of any communication by radiotelegraphy under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for two years.

Provided that if it shall appear to any magistrate upon a preliminary inquiry into an offence against this section that it is not expedient to the ends of justice that any person charged with an offence against this section should be prosecuted in the Supreme Court, such magistrate may proceed summarily to hear and determine the charge and the offender shall on conviction thereof at the discretion of the magistrate, be liable to a penalty of £10 or to be imprisoned for one year.

6. Any person employed or engaged in any capacity whatsoever under this Act who shall, contrary to his duty, disclose or in any way make known or intercept the contents or any part of the contents of any message transmitted or received or to be transmitted or received to or at any radiotelegraph station under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for one year.

7. Whosoever shall unlawfully and maliciously by any overt act attempt to commit any of the offences mentioned in sections 5 and 6 of this Act shall on conviction thereof before a magistrate be liable, at the discretion of the magistrate, to a penalty of £5 or to be imprisoned for three months.

8. Any person who erects, constructs, establishes or maintains or commences to erect, construct, establish or maintain any instrument or apparatus for the purpose of transmitting or receiving or who transmits or receives messages within the Colony or across the seas by means of any radiotelegraphy whatsoever without having first obtained a license so to do under this Act, shall be liable on summary conviction before a magistrate to a penalty of £200 or to be imprisoned for one year, anything in the Magistrates Acts, 1896 to 1909, or any Act passed in amendment thereof or in substitution thereof to the contrary notwithstanding.

9. Any radiotelegraph station established under this Act with funds granted by the Legislature and any apparatus, machine, matter or thing used in connection therewith, is hereby declared to be the property of the Government of the Colony, and in all legal proceedings whatsoever instituted and taken in relation thereto the same may be laid and referred to as the property of the said Government.

10. The Acts set out in the Schedule to this Act are hereby repealed.

SCHEDULE.

Regnal Year and Chapter.	Short Title.
2 Ed. VII c. 22	The Wireless Telegraphy Restriction Act, 1902.
3 Ed. VII c. 17	The Wireless Telegraphy Restriction Amendment Act, 1903.

RULES MADE BY THE GOVERNOR IN COUNCIL ON THE 3RD DAY OF NOVEMBER, 1913, UNDER THE AUTHORITY OF THE TELEGRAPH ACTS 1891 to 1913.

B Paragraphs 1-14 inclusive refer solely to the wired telegraph system.

15. The radiotelegraph system shall be operated under the rules contained in the "Detailed Service Regulations" appended to the International Radiotelegraph Convention signed at London on the 5th day of July, 1912.

A copy of such "Detailed Service Regulations" shall be kept on file in the telegraph offices.

16. All apparatus for radiotelegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any radiotelegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

17. No apparatus for radiotelegraphy on board a merchant ship shall be worked or used whilst such ship is in the territorial waters of the Colony, except with the special or general permission in writing of the Governor.

18. Rules 16 and 17 shall not apply to the use of radiotelegraphy for the purpose of making or answering signals of distress.

19. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by radiotelegraphy the use of radiotelegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Council from time to time and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

20. The master of any merchant ship on board of which apparatus for radiotelegraphy shall be worked or used contrary to these Rules shall on summary conviction before a Magistrate be liable to a penalty of £200 and in default of payment to be imprisoned for a period of twelve months.

TARIFF OF CHARGES.

21. From New Providence to the American Coast ninepence-halfpenny a word, plus the charges over the lines of other telegraph administrations, as published in the tariff book of the Western Union Telegraph Company, a copy of which shall be kept on file in the telegraph offices.

From New Providence to radio ship stations, threepence for each word, plus the rate charged by the ship station.

A "Deferred Message Service" at half the ordinary charge per word is in effect between the Bahamas and certain other countries.

A list of such countries and a copy of the rules governing this class of message shall be kept on file in the telegraph offices.

Made by the Governor in Council this 3rd day of November, 1913.

By order,

W. B. HADDON-SMITH, Captain,

Clerk to the Executive Council.

BARBADOS

BARBADOS (latitude $13^{\circ} 4' N.$ and longitude $59^{\circ} 37' W.$) is the most easterly of the West Indian Islands. Its superficial area is reckoned at 166 square miles, with a population of 198,336. It fell first under British rule in 1605, and has so remained ever since.

CONTROL AND ORGANISATION.

Wireless telegraphy in this Colony owes much to a wireless club formed amongst a number of young Barbadians. Starting with some home-made apparatus, whose aerials were supported on bamboo poles, the local radiotelegraphic station, after the commencement of the late war, developed rapidly, assisted by a private subscription list, which was headed by the Governor and Members of the Legislative Council.

Practical demonstration of its utility became so unmistakable that a two-kilowatt installation was erected and maintained for defence purposes, but affording every facility (compatible with military considerations) to merchants and shipping agents. Since the cessation of hostilities the station is open for general public correspondence and worked in accordance with the International Radiotelegraphic Convention.

This constitutes the only land station in Barbados, and is worked under Government control.

There are no regular aviation or meteorological services, but local weather reports are available to ships on request. There are no time, hydrographic or press signals.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. C. Rose, Assoc. I.R.E...	O. C. Wireless Station	Barbados.
W. C. Fenty, Assoc., I.R.E.	Chief Operator	Barbados.
P. W. Croncy	Second Operator	Barbados.

ADMINISTRATION.

Wireless telegraphy in Barbados is worked under three Acts and one set of regulations, the Barbados Wireless Act of 1905, two Amending Acts, passed in 1913 and 1917, and a number of rules made under these latter acts.

As these are quite distinct, we publish their respective texts below :—

A—Wireless Act, 1905 (confirmed 1908).

B—Wireless and Submarine Telegraph (Amendment) Act, 1913.

C—Wireless and Submarine Telegraph (Amendment) Act, 1917.

D—Rules made under the 1913 and 1917 Acts.

WIRELESS ACT, 1905 (CONFIRMED 1908).

A 1. This Act may be cited as the Wireless and Submarine Telegraph Act, 1905.

2. (1) The West India and Panama Telegraph Company shall not lay down or maintain a new telegraph cable nor shall any other company or person lay down or maintain any telegraph cable upon the foreshore and bed of the sea except under and in accordance with an Act of the Legislature.

(2) A person shall not establish any wireless telegraph station, or instal or work any apparatus for wireless telegraphy in any place in this island except under and in accordance with an Act of the Legislature.

(3) If the West India and Panama Telegraph Company lays down or maintains a new telegraph cable or if any other company or person lays down or maintains any telegraph cable upon the foreshore or bed of the sea without the authority of an Act of the Legislature in that behalf, the company or person shall be liable, on conviction before a Police Magistrate to a penalty not exceeding £100, and shall forthwith remove the telegraph cable, and if the telegraph cable be not removed within one day after such conviction the company or person shall be liable to a penalty not exceeding £50 for each day thereafter during which the company or person shall fail to remove the telegraph cable. Provided, that the Governor-in-Executive Committee may at any time after the expiration of one day from the date of the conviction cause the same to be removed and destroyed.

(4) If any person establishes a wireless telegraph station without the authority of an Act of the Legislature in that behalf, or installs or works any apparatus on any place in this island for wireless telegraphy without such authority in that behalf, he shall be liable, on conviction before a Police Magistrate, to a penalty not exceeding £100, and further be liable to forfeit any apparatus for wireless telegraphy installed or worked without such authority.

(5) If a Police Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without legal authority in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place within his jurisdiction without such authority in that behalf, he may grant a search warrant to any police officer named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station or place and to seize any apparatus which appears to him to have been used, or intended to be used, for wireless telegraphy therein.

(6) No proceedings shall be taken under any of the provisions of this section except by order of the Governor.

WIRELESS ACT, 1913.

Passed on April 11th, 1913.

B 1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1913 (1913-16).

2. (1) *Making of Rules and Regulations.*—The Governor-in-Executive Committee may from time to time make rules and regulations governing the use of wireless telegraph apparatus on merchant ships, British or foreign, while in the territorial waters of this Colony.

(2) *Ratification.*—Such rules and regulations when sanctioned by both Houses of the Legislature and assented to by the Governor, shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(3) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any of these rules and regulations:

(a) The ship shall be subject to a maritime lien in favour of His Majesty the King, his heirs and successors, for a sum of one hundred pounds, and the amount so charged may be sued for and recovered in the Colonial Court of Admiralty;

(b) The ship may be detained by force if necessary by the Harbour and Shipping Master or his chief clerk, with the aid of the harbour police, until payment of the lien aforesaid or until arrested under process of the Colonial Court of Admiralty;

(c) The master of such ship shall be liable to a penalty not exceeding fifty pounds.

(d) The person committing the breach shall be liable to a penalty not exceeding fifty pounds.

3. (1) *Special Orders.*—In any case of urgency which is not provided for in the rules and regulations, the Governor may make any special order, and such order shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(2) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any special order, the ship shall be subject to the maritime lien imposed by section 2 of this Act for the amount therein mentioned and may be detained as is therein provided, and the master, and the person committing the breach, shall be liable to a penalty not exceeding fifty pounds.

AN ACT

C To amend the Wireless and Submarine Telegraph Amendment Act, 1913. (1913-16.)

Be it enacted by the Governor, Council, and Assembly of this island, and by the authority of the same, as follows:—

1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1917.

2. The Wireless and Submarine Telegraph (Amendment) Act, 1913, is hereby amended by inserting the words "and yachts" immediately after the words "merchant ships" in line three of subsection 1 of section 2 thereof, and the word "ship" wherever occurring in the subsequent parts of the Act shall be construed as including a yacht.

3. The Regulations made under the authority of the said Act by the Governor-in-Executive Committee on the thirty-first day of July, nineteen hundred and thirteen, shall apply to yachts as fully and in the same manner in all respects as they do to merchant ships.

RULES MADE BY THE GOVERNOR IN EXECUTIVE COMMITTEE UNDER SECTION 2 (1) OF ACT 1913-16, ON JULY 31ST, 1913, CONFIRMED AUGUST 11TH, 1914.

D 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling or (b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony.

or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Secretary of the Colony.

3. If at any time, in the opinion of the

Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

JAMAICA

THIS "Land of Wood and Water" is the largest of the British West Indian groups, covering an area of 4,431 square miles, with a population of 857,921. Situated about 90 miles south of Cuba, between latitude $17^{\circ} 43'$ and $18^{\circ} 32' N.$; its longitude stretches from $76^{\circ} 11'$ to $78^{\circ} 21' W.$ It was discovered on May 3rd, 1494, by Columbus, and named after St. James. The Governor is assisted by a Privy Council and a Legislative Council, the latter consisting partly of nominated and partly of elected members.

ADMINISTRATION.

The Laws and Regulations under which radiotelegraphy is administered comprise the following:—

A—Telegraph Control Law, 1904.

B—Direct West India Cable Company's Law, 1909

C—Regulations under Law of 1904.

D—Further Rules and Regulations.

E—Regulations under the Defence of the Island Law.

THE TELEGRAPH CONTROL LAW (7) OF 1904.

1. No person shall, within the Colony or any of its Dependencies, establish, maintain or use any telegraphic apparatus, mechanism, or contrivance, of what nature or kind soever the same may be, without due permission or license under the hand of the Governor previously obtained for that purpose.

It is hereby expressly declared that what is commonly known as "wireless telegraphy," including the Marconi apparatus and any similar or other mechanism or contrivance whatsoever for the transmission of telegraphic messages without the employment of wires or cables, is a telegraphic apparatus, mechanism or contrivance within the meaning of this Section.

2. It shall be lawful for the Governor in Privy Council from time to time to make and as he shall see fit repeal, alter or vary rules and regulations for all or any of the following purposes, viz:—

Permitting or licensing any person to establish, maintain, or use any telegraphic apparatus, mechanism, or contrivance, whether for the service of the public or for any private purpose;

Attaching conditions, restrictions, and limitations to the exercise of the privilege by such permission or license conferred;

Providing suitable penalties and forfeitures for the contravention of the prohibition above contained in Section 1 of this law, and to the breach of any rule or regulation made thereunder, and providing for the recovery thereof, summarily or otherwise; provided that the penalty (over and above forfeitures) to be imposed for any one offence shall in no case exceed a fine of Two Hundred Pounds, or in

default of payment thereof imprisonment, with or without hard labour, for a period not exceeding twelve months;

The exercise of all such powers and control over telegraphic establishments (by temporarily entering into possession thereof or otherwise) as may be necessary for the public safety, whether at all times, or in any case of emergency which may arise.

And generally for the better carrying out of the purposes of this law.

Such rules and regulations shall come into force as from the date of publication thereof in the *Jamaica Gazette*.

3. Nothing in this law contained shall invalidate or impair any legal right already possessed by any telegraph or cable company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance, and use thereof, or any other like matter.

4. Law 1 of 1903 is hereby repealed.

LAW 21 OF 1909.

THE DIRECT WEST INDIA CABLE COMPANY'S LAW, 1909.

Whereas the Direct West India Cable Company, Limited, is desirous of establishing a wireless installation for communication between ships and the shore in Jamaica;

And whereas under the provisions of Law 7 of 1904, entitled "The Telegraph Control Law, 1904," no person shall establish, maintain or use within the Island of Jamaica, or any of its Dependencies, any apparatus or machine whereby communication by wireless telegraphy can be held between the said Island and ships, without having first obtained the sanction of and a license from the Governor

And whereas a license to erect such a wireless station has been granted to the Direct West India Cable Company, Limited, by the Governor of Jamaica.

Be it enacted by the Governor and Legislative Council in Jamaica as follows:—

1. The protection, rights, powers, and facilities already granted to the Direct West India Cable Company, Limited, under Law 16 of 1898, entitled "The Direct West India Cable Company's Law, 1898," are granted and extended for the purposes of wireless telegraphy installation to be installed by the company or worked and maintained by them in so far as they may be applicable to the satisfactory and efficient working and maintenance of a wireless station or stations.

2. The Government of Jamaica shall acquire for the use and at the expense of the company a piece of land of sufficient dimensions at a place to be selected by the company and approved by the Government suitable and convenient for the economical erection, maintenance, and working of the installation, and when acquired such piece of land shall be conveyed to the company in fee simple, or if the Government of Jamaica possesses a piece of land of sufficient dimensions at a place approved by the company suitable and convenient for the economical erection, maintenance, and working of the installation and which the Government considers it desirable the company should have, the Government may sell the said piece of land at a price to be mutually agreed upon, or the Government may rent it to the company on such terms as may be agreed on during the period of the license or for so long as the company may continue to work a wireless station or stations.

The acquisition of land by the Government of Jamaica under this section shall be deemed as an acquisition for public works within the meaning of the Public Lands Acquisition Law, 1897 (Law 31 of 1897).

REGULATIONS.

It will be noted that under Clause 2 of the Telegraph Control Law (7), 1904, the Governor in Privy Council has the power of making rules and regulations, and a set of rules were accordingly promulgated during the year 1909, under which the working of wireless telegraphy is now being administered in Jamaica. These rules read as follows:—

C 1. Any license granted under Law 7 of 1904 shall only entitle the licensee to establish, maintain and use that particular class of telegraph apparatus, mechanism, or contrivance mentioned in the license. Every license granted under the said law shall make mention of and fully describe the particular class of telegraphic apparatus, mechanism or contrivance which the applicant proposes to establish, maintain and use.

2. Every person establishing, maintaining or using any telegraphic apparatus, mechanism or contrivance in contravention of Section 1 of the Telegraph Control Law, 1904 (Law 7 of 1904), shall be liable to penalty not exceeding two hundred pounds, or, in default of payment, to be imprisoned with or without hard labour for a period not exceeding twelve months, and the telegraphic apparatus, mechanism or contrivance so established, maintained or used shall be liable to be forfeited to the Government of Jamaica.

3. Every person licensed under this law, who uses any telegraphic apparatus, mechanism or contrivance, for which he has not a license shall be liable to the penalty and forfeiture

mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

4. Every person licensed under this law who acts contrary to the terms of this license shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

5. Proceedings for penalty and forfeiture under these rules shall not be taken except upon the authority of the Attorney-General.

6. Proceedings for the recovery of any penalty and for any forfeiture under these rules shall be of a summary nature and shall be taken before the Resident Magistrate for Kingston.

FURTHER RULES.

D Further Rules and Regulations made by the Acting Governor in Privy Council under the Telegraph Control Law, 1904, Law 7 of 1904.

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Governor.

3. These rules and regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of the wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules and regulations as may be made by the Governor from time to time, and such rules and regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these rules and regulations shall on summary conviction before a Resident Magistrate be liable to a penalty not exceeding two hundred pounds, and in default of payment to be imprisoned with or without hard labour for a period not exceeding twelve months.

REGULATION UNDER THE DEFENCE OF THE ISLAND LAW.

E Whereas by the powers conferred by Law 9 of 1915, the Defence of the Island Law, 1915, the Governor in Privy Council on the 7th day of August, 1917, made certain Regulations called the Defence of the Island (Consolidation) Regulations, 1917:

And whereas the said Regulations have been amended from time to time by the Governor in Privy Council:

And whereas it is expedient further to amend the said Regulations in manner hereinafter appearing:—

Now, Therefore, the Governor by and with the advice of Privy Council doth order and it is hereby ordered as follows :—

After Regulation 43 the following Regulation shall be inserted :—

43A. (1) Every British sea-going ship of sixteen hundred tons gross tonnage or upwards in respect of which a license to instal wireless telegraph apparatus has been granted by the Governor in Privy Council shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service, and shall be provided with two certified operators, together with suitable accommodation for the apparatus and operators.

(2) Application to the Governor in a form prescribed by him for such a license shall, unless a license has before the making of this regulation been granted in respect of the ship, be made on or before the 1st day of May, 1918, by the owner of every such ship which is registered in Jamaica.

(3) The Governor shall, and when wireless telegraph apparatus and the services of operators become available for the purpose, cause licenses to be issued in respect of such ships as in the opinion of the Governor should in the national interests be fitted with such apparatus, and the licenses shall specify the

date as from which the carrying of such apparatus, under this regulation is to be compulsory, the character of the apparatus, and the qualifications of the operators.

(4) The Governor may :—

(a) Extend the time mentioned in the license as the time within which any apparatus is to be provided; and

(b) Exempt any ship from the obligations imposed by this regulation.

(5) If the provisions of this regulation or the terms of any license granted thereunder are not complied with in the case of any ship, the master or owner of the ship shall be guilty of a summary offence against these regulations, and if any master fails to make an application in accordance with this regulation he shall be guilty of a summary offence against these Regulations, and in either case if the ship is at any time subsequently found at a port or off within the territorial waters adjoining Jamaica the ship may be seized and detained.

(6) In this Regulation expressions have the same meaning as in the Merchant Shipping Acts, 1894 to 1914.

Made by the Governor in Privy Council this 9th day of April, 1918.

D. H. HALL,
Clerk, Privy Council.

LEEWARD ISLANDS

THE Leeward Islands are situated to the North of the Windward group, and south-west of Porto Rico. They have an area of 715 square miles, and a population of 127,193. The Colony is under one Governor, who resides at Antigua. The administrative centre and the residence of the Governor-in-Chief is St. John's, Antigua.

ADMINISTRATION.

No wireless stations exist, but wireless telegraphy would be administered under :—

A—Ordinance No. II, 1913.

B—Regulations made thereunder in 1913; and

C—Further Regulations dated 28th August, 1917.

D—Wireless Telegraphy Consolidating Ordinance 1913 (Dominica).

Similar legislation is in force in the other islands under the same administration.

ANTIGUA, No. II OF 1913.

A An Ordinance to consolidate and amend the law relating to wireless telegraphy.

Be it ordained by the Governor and Legislative Council of Antigua as follows :

1. This Ordinance may be cited for all purposes as "The Wireless Telegraphy Consolidation Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor-in-Council.

(2) Every such license shall be in such form and for such period as the Governor-in-Council may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. No person shall work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Presidency, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor-in-Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor-in-Council an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have

control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any Police Officer or any person appointed in that behalf by the Chief Inspector of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person guilty of an offence against any provisions of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings under this Ordinance shall be taken on the complaint of the Chief Inspector of Police or of any person thereto authorised by him in writing.

8. Ordinance No. 12 of 1903 entitled "An Ordinance to regulate the establishment of Wireless Telegraphy" and Ordinance No. 7 of 1913 entitled "An Ordinance to amend the Wireless Telegraphy Ordinance, 1903," are hereby repealed.

Passed the Legislative Council the 14th day of October, 1913.

Dated at Antigua the 23rd day of October, 1913, in the fourth year of His Majesty's reign.

SCHEDULE—SECTION 5 (2).

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Presidency shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Presidency or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Presidency except with the special or general permission of the Governor-in-Council.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

REGULATIONS.

MADE BY THE GOVERNOR-IN-COUNCIL.

C Whereas it is provided by section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, that if at any time, in the opinion of the Governor-in-Council, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas in my opinion such emergency as aforesaid has arisen:

Now I do hereby rescind the further Regulations made under the said Ordinance on the 8th day of September, 1914, and make the following Regulations, namely:—

1. The radiotelegraph stations on board ships (other than ships requisitioned by His Majesty's Government) shall not be worked whilst such ships are within a harbour of the Presidency and for the proper enforcement of the above.

(a) Ships of British register in harbours of the Presidency must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(b) Ships of foreign register in a harbour of the Presidency must, subject to the provisions of the following sub-sections (c) take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(c) Ships of foreign register remaining in the harbour of the Presidency for less than twelve hours may at the discretion of the Governor be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of sub-section (a) of this Regulation.

2. The Governor may at his discretion direct that the operating room of any ship (other than a ship requisitioned by His Majesty's Government) in a harbour of the Presidency be sealed or order any other steps to be taken affecting the radiotelegraph station on board any such ship.

3. Every person failing to obey and conform with the provisions of these Regulations or with any directions given by the Governor under the same shall be guilty of an offence and shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council, under section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, this 28th day of August, 1917.

THE WIRELESS TELEGRAPHY CONSOLIDATION ORDINANCE, 1913.

REGULATIONS MADE BY THE GOVERNOR-IN-COUNCIL.

D The Regulations made by the Governor-in-Council dated 2nd day of December, 1914, are hereby rescinded and the following substituted therefore:—

1. The radiotelegraphic apparatus on board ships shall not be worked whilst such ships are within the territorial waters of this Presidency, except as is hereinafter provided.

2. The Governor may appoint any person to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Presidency.

3. Any person so appointed may enter upon any such ship and take possession of the afore-said apparatus thereon on behalf of His Majesty

and use the same for His Majesty's service and subject thereto for such ordinary services as to the said person may seem fit.

4. For the proper enforcement of the above the person so appointed may—

(a) Require the master of any ship being within the territorial waters of the Presidency to completely disconnect the aerial wires from the radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected, or

(b) Take down the aerial wires completely, and disconnect the same from the radiotelegraphic apparatus.

(c) Seal up the radiotelegraphic cabin on any ship, and the seal on such cabin shall not be broken without the consent of such person while the ship is within the territorial waters of the Presidency.

5. The master of any ship who shall refuse or fail to carry out any instructions given by a person appointed as aforesaid or shall obstruct any such person in the enforcement of these regulations, or shall break any seal shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council this 10th day of July, 1917.

R. B. SKINNER,
Acting Clerk of Council.

TRINIDAD

THE Colony of Trinidad lies north of the mouth of the Orinoco. It has an area of 1,977 square miles and a population of 391,279.

The group forms Crown a Colony, and their government is administered by a Governor, assisted by an Executive Council and Legislative Council.

CONTROL AND ORGANISATION.

The first wireless station in Trinidad was erected in 1905 at the north-western corner of the island to obtain a direct sea line with Tobago, and merely to bring Tobago into telegraphic communication with Trinidad and thus with the outer world. It was a 2-kW. Lodge-Muirhead station. Subsequently this station was removed, and a 5-kW. Marconi station was erected in Port of Spain, with a daylight range of about 350 nautical miles and 1,000 nautical miles at night. Public ship and shore service is maintained therewith.

The Tobago station is on Fort King George, east of Scarborough, the capital of Tobago, and is a 3-kW. station (Marconi and Lodge-Muirhead), with a daylight range of about 350 nautical miles, and about 600 nautical miles at night.

The Trinidad and Tobago stations are open day and night for commercial service. There are no relaying charges between the two stations, and if ships are unable to obtain communication with Trinidad they endeavour to communicate with Tobago.

The Trinidad and Tobago Government Wireless Service is a branch of the Public Works Department and under the control of the Director of Public Works. The senior officers of the Wireless branch of the Public Works Department are as follows:—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Capt. J. Nethercoate, Royal Corps of Signals (R)	O/C. Wireless Station	Trinidad
L. W. Pouchet, A.M.I.R.E. ..	Chief Operator	Trinidad
A. E. Wilson	Second Operator	Tobago

ADMINISTRATION.

The Law and Regulations governing radiotelegraphy are reprinted below :—

A—Ordinance No. 6 of 1917.

B—Regulations.

ORDINANCE No. 6 OF 1917.

ISSUED MAY 8TH, 1917.

A Be it enacted by the Governor of Trinidad and Tobago with the advice and consent of the Legislative Council thereof as follows :—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1917.

2. (1) It shall not be lawful for any person to use or establish in this Colony any apparatus or installation for the purposes of wireless telegraphy, without first obtaining from the Governor a license in that behalf, to be granted on such terms and conditions as the Governor may from time to time prescribe.

(2) Any person contravening the provisions of this section is liable on summary conviction before a Magistrate to a fine not exceeding £50 or to imprisonment with or without hard labour, for any term not exceeding six months, and the apparatus and installation in respect of which a conviction is obtained may by order of the convicting magistrate be forfeited to the use of His Majesty the King.

3. (1) No person shall work any apparatus for wireless telegraphy installed on any merchant ship whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Executive Council.

(2) Such regulations shall be published in the *Royal Gazette*.

(3) Any person contravening, or permitting, procuring, or assisting in the contravention of, any such regulation is liable, on summary conviction before a magistrate, to a penalty not exceeding £50, or to imprisonment, with or without hard labour, for any term not exceeding six months.

4. Any person who unlawfully and maliciously :—

(a) Injures, removes or destroys any apparatus or installation for the purpose of wireless telegraphy, or any part of such apparatus or installation ; or

(b) Obstructs or prevents in any manner whatsoever the sending, conveyance or delivery of any message or signal by wireless telegraphy ;

is guilty of a misdemeanour and is liable to imprisonment, with or without hard labour, for any term not exceeding two years.

5. The Wireless Telegraph Ordinance (No. 236) and the Wireless Telegraphy Ordinance 1909 are hereby repealed.

Passed in Council this twenty-seventh day of April, in the year of Our Lord one thousand nine hundred and seventeen.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1917.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be worked so as not to interrupt or interfere with the transmission of any messages between the wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Director of Public Works of the Colony. Such special or general permission shall only be given to any ship subject to the condition that it shall not exchange signals with another ship except on the private business of the owners.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Executive Council.

4. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering the signals of distress.

5. The regulations made under the Wireless Telegraphy Ordinance, 1917, on the 5th day of July, 1917, are hereby revoked.

Made by the acting Governor in Executive Council this 12th day of June, 1919.

WINDWARD ISLANDS

THIS group forms the eastern barrier to the Caribbean Sea between Martinique and Trinidad. They have an area of 473 square miles, and a population of 169,588. The group is under the administration of a Governor.

ADMINISTRATION (GRENADA).

Wireless telegraphy is regulated by the following Ordinances and Regulations :—

A—Wireless Telegraph Ordinance.

B—Ordinance to amend the Wireless Telegraph Ordinance.

C—Ordinance to Consolidate and Amend the Law Relating to Wireless Telegraphy.

D—Wireless Telegraph Ordinance, 1911 and 1913.

E—Wireless Telegraph Ordinance, 1913.

F—Regulations rescinding certain regulations with respect to the use of Wireless Telegraphy on Ships.

THE REVISED LAWS OF GRENADA.
CHAPTER CXIII.

THE WIRELESS TELEGRAPH ORDINANCE.

A AN ORDINANCE FOR THE MANAGEMENT BY THE GOVERNOR-IN-COUNCIL OF ALL INSTRUMENTS AND APPARATUS DESIGNED FOR THE TRANSMISSION OR RECEIPT WITHOUT THE INTERVENTION OF WIRE OR OTHER TANGIBLE CONNECTION, OF TELEGRAPHIC OR ELECTRIC MESSAGES, COMMONLY CALLED "WIRELESS TELEGRAMS," DECEMBER, 15TH, 1903.

1. In this Ordinance—

The term "Wireless Telegraphy" means any system or installation, designed or constructed for the transmission or receipt of any messages or communications to or from a distant place by means of electric currents and signals generated by any apparatus or instrument which system, installation or instrument is unconnected by wire or other tangible attachment with such distant place;

The term "Wireless Telegram" means any message or communication transmitted, or intended for transmission, by Wireless Telegraphy.

2. The Governor-in-Council and the servants of the Government of the Colony shall have the exclusive privilege of installing, erecting, maintaining and using this Colony apparatus intended for Wireless Telegraphy, and also the incidental services of transmitting, receiving, collecting or delivering Wireless Telegrams.

3. It shall not be lawful for any person to instal, erect, maintain or use in this Colony any apparatus or instrument for the purpose of Wireless Telegraphy without having previously obtained from the Governor a license in that behalf to be granted on such terms and conditions as the Governor may prescribe.

4. Any person contravening the provisions of this Ordinance shall be liable on conviction to a fine not exceeding Fifty Pounds, and the apparatus and installation in respect of which a conviction is obtained may by order of the Magistrate before whom such conviction is obtained be forfeited to the use of His Majesty the King.

5. All proceedings under this Ordinance may be taken before the Magistrate of the Southern District or any other person appointed by the Governor for the purpose of hearing and deciding the case; and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on summary conviction.

6. This Ordinance may be cited as "The Wireless Telegraph Ordinance."

AN ORDINANCE TO AMEND THE WIRELESS TELEGRAPH ORDINANCE.

JANUARY 15TH, 1913.

B Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada as follows:—

1. The Governor-in-Council may make regulations—

(a) Prescribing the form and manner in which applications for licenses under the principal Ordinance are to be made and the fees payable on the grant of any such license;

(b) Governing the use of wireless telegraph apparatus on merchant ships, whether British or Foreign, while in the territorial waters of the Colony; and

(c) Generally for the purpose of carrying the principal Ordinance into effect.

2. Any person committing a breach of any regulation made under this Ordinance shall be liable on summary conviction to a fine not exceeding Twenty Pounds.

3. (1) This Ordinance may be cited as the Wireless Telegraph Amendment Ordinance, 1913, and shall be read as one with the Wireless Telegraph Ordinance, and may be cited therewith as the Wireless Telegraph Ordinances, 1911 and 1913.

(2) The Wireless Telegraph Ordinance is herein referred to as the principal Ordinance.

Passed the Legislative Council this tenth day of January, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

I assent,

J. HAYES SADLER,
Governor.

January 15th, 1913.

AN ORDINANCE TO CONSOLIDATE AND AMEND THE LAW RELATING TO WIRELESS TELEGRAPHY. SEPTEMBER 1ST, 1913.

C Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada, as follows:—

1. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or Foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. If a magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the magistrate of the Southern District on the complaint of the chief of police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

7. The Wireless Telegraph Ordinance, and the Wireless Telegraph Amendment Ordinance, 1913, are hereby repealed.

8. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

SCHEDULE.

REGULATIONS.

(i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these Regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

I assent.

J. HAYES SADLER,
Governor.

August 29th, 1913.

Passed the Legislative Council this fifteenth day of August, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

THE WIRELESS TELEGRAPH ORDINANCES, 1911 AND 1913.

REGULATIONS WITH RESPECT TO THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS.

(Gazetted 1st February, 1913.)

D Under the authority of section one of the Wireless Telegraph Ordinance, 1913, the following regulations are hereby made by the Governor-in-Council:—

1. In these regulations the expression "merchant ship" means any merchant ship, whether British or foreign.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such a ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Postmaster.

4. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor-in-Council this 31st day of January, 1913.

C. LIVINGSTON WILSON,
Clerk of Councils.

THE WIRELESS TELEGRAPHY ORDINANCE, 1913.

REGULATIONS MADE BY THE GOVERNOR.

(Gazetted 3rd August, 1914.)

E Whereas it is provided by section 4 (3) of the Wireless Telegraphy Ordinance, 1913, that if at any time in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas in my opinion such emergency as aforesaid has arisen:

Now I do hereby make the following further regulations, namely:—

1. The Governor may appoint any person to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Colony.

2. Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty and use the same for His Majesty's Service and subject thereto for such ordinary services as to the said person may seem fit.

ADMINISTRATION (SAINT VINCENT).

No wireless stations exist in this Colony, but wireless telegraphy would be administered under an Ordinance and Regulations which figure below.

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations.

ORDINANCE.

A This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions, and restrictions on and subject to which it is granted.

3. Any such person may instead of taking possession of such apparatus as aforesaid direct the master of the ship to submit or cause to be submitted to him all messages intended for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him, and generally to obey all such directions with reference to the transmission of messages as such person may prescribe, and the master of the ship shall obey and conform to all such directions. Any master failing to obey and conform to any such direction shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by me under the provisions of the Wireless Telegraph Ordinance, 1913, this third day of August, 1914.

DOUGLAS YOUNG,
Acting Governor.

REGULATIONS RESCINDING CERTAIN REGULATIONS WITH RESPECT TO THE USE OF WIRELESS TELEGRAPHY ON SHIPS IN THE TERRITORIAL WATERS OF THE COLONY.

(Gazetted 1st May, 1919.)

F Under and by virtue of a Royal Order in Council dated the 26th day of October, 1896, and of three amending Orders in Council dated respectively the 11th day of October, 1913, the 20th day of August, 1914, and the 21st day of March, 1916, the Governor hereby makes the following regulation:—

The Regulations made under the above-mentioned Orders in Council on the 17th day of August, 1918, with respect to the use of Wireless Telegraphy on Ships in the territorial waters of the Colony are hereby rescinded.

Made by the Governor this 1st day of May, 1919.

G. B. HADDON-SMITH,
Governor.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The Regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such

further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search warrant to any Police Officer or any person appointed in that behalf by the Chief of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the Police Magistrate of the First District on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. "The Wireless Telegraph Ordinance, 1904," and "The Wireless Telegraph Amendment Ordinance, 1912," are hereby repealed.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Regulations made by the Governor in Council on the 17th day of December, 1912, under the authority of the Wireless Telegraphy Ordinances, 1904 and 1912, are hereby repealed.

CONTROL AND ORGANISATION (SAINT LUCIA).

The wireless station situated on the Morne Fortuné overlooking the capital was erected by the Admiralty in 1915, and was maintained and controlled by that Department until January, 1922, when it was transferred to the local Government. At present, June, 1922, the station is not working, owing to the fact that it has not yet been possible to complete arrangements for replacing the withdrawn naval staff, but it is hoped to resume operations by August.

ADMINISTRATION.

Wireless telegraphy is administered under an Ordinance No. 128, 1916 Revision and Regulations issued on its authority.

A—Wireless Telegraphy Ordinance, No. 128, 1916 Revision.

B—Regulations thereunder.

WIRELESS TELEGRAPHY ORDINANCE.

No. 128, 1916 REVISION.

A This Ordinance may be cited as the Wireless Telegraphy Ordinance.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the

messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work

any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or Foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the Chief of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the First District Court on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof; and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. The Governor may appoint any person to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Colony.

5. Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty, and use the same for His Majesty's Service, and subject thereto for such ordinary services as to the said person may seem fit.

6. Any such person may instead of taking possession of such apparatus as aforesaid direct the master of the ship to submit or cause to be submitted to him all messages intended for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him, and generally to obey all such directions with reference to the transmission of messages as such person may prescribe, and the master of the ship shall obey and conform to all such directions. Any master failing to obey and conform to any such direction shall be liable on summary conviction to the penalties provided under the Ordinance.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BULGARIA

(See also Map Section)

SITUATED between Greece, Serbia and Roumania, with a seaboard on the Black Sea, Bulgaria is a sovereign state under the Czar Boris III. It has an area of 105,329 square kilometres and a population of 4,861,439.

CONTROL AND ADMINISTRATION.**OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.**

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. Nicholas Startcheff ..	Director-General of Posts, Telegraphs and Telephones.	Sofia.

As far as is known only four fixed stations exist. Their working is in conformity with the Radiotelegraphic Convention of London.

CAMEROON

(See also Map Section).

Including : British Cameroon and French Cameroon. (For French Cameroon see under FRENCH EQUATORIAL AFRICA—FRENCH CONGO).

CAMEROON comprises the former German Colony of Kamerun and is now divided up between Britain and France. The area of the French territory is 166,489 square miles and that of Britain 31,000 square miles. The total population is 2,540,000, which is under the administration of the Governor of Nigeria.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Cameroons.

CANADA

(See also Map Section)

Including the Provinces of Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon and the North-West Territories.

THE Dominion of Canada possesses a land area of 3,729,665 miles and a population of 8,772,000. It was originally discovered by Cabot, in 1497, then settled by the French in the seventeenth century, and finally annexed to the British Empire in 1763. Its establishment as a Dominion dates from July 1st, 1867. The executive power is vested in a Governor-General appointed by the Sovereign and aided by a Privy Council.

CONTROL.

The control of radiotelegraphy and telephony in Canada is now as set out in the following notice :—

NOTICE.—Effective 1st July, 1922, the administration of the Radiotelegraph Act has been transferred from the Department of the Naval Service to the Department of Marine and Fisheries. Wherever the term "Naval Service" appears in the Radiotelegraph Act and Regulations issued thereunder, or in the licenses for radiotelegraph stations, the term "Marine and Fisheries" is to be substituted therefor.

On and after the above date all communications regarding the administration of radiotelegraphy and radiotelegraph licenses should be addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

Ottawa, 3rd July, 1922.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
The Hon. E. Lapointe ..	Minister of Marine and Fisheries	Department of Marine and Fisheries, Ottawa.
Mr. A. Johnston	Deputy Minister of Marine and Fisheries	Department of Marine and Fisheries, Ottawa.
Lieut. Commander C. P. Edwards, O.B.E. ..	Director, Government Radio Service	Department of Marine and Fisheries, Ottawa.
Mr. W. A. Rush	Division Superintendent, East Coast and Central Canada ..	Department of Marine and Fisheries, Ottawa.
Mr. E. J. Haughton	Division Superintendent, Pacific Coast ..	Old Post Office Building, Victoria, B.C.
Mr. A. N. Fraser	Headquarters Engineer ..	Department of Marine and Fisheries, Ottawa.
Mr. D. Manson	Chief Inspector	Department of Marine and Fisheries, Ottawa.
Mr. J. A. Holmes	Chief Traffic Officer	Department of Marine and Fisheries, Ottawa.
Mr. L. W. Stephenson ..	District Engineer, Pacific Coast	Old Post Office Building, Victoria, B.C.
Mr. J. D. Taylor	East Coast Radio Officer and District Engineer.	H.M.C. Dockyard, Halifax, N.S.
Mr. J. M. Colton	Inspector for Port of Montreal	Old Customs Building, Montreal, P.Q.
Mr. W. Howard	Inspector for Pacific Coast ..	Old Post Office Building, Victoria, B.C.

ORGANISATION.

According to the latest available information there are 4,695 radio-telegraph and telephone installations, classified as follows:—

Coast Stations	36
Licensed Ship Stations	244
Licensed Public Commercial Stations (radiotelegraph)	6
" " " (radiotelephone broadcasting)	53
Licensed Private Commercial Stations	28
Licensed Radiotelegraph Training Schools	17
Licensed Experimental Stations	40
Licensed Amateur Experimental Stations	4,258
Licensed Amateur Broadcasting Stations	2
Licensed Limited Coast Stations	1
Government Land Stations	1
Direction Finding Stations	4
Aircraft, Ground Stations	5

Total 4,695

The following coast stations were closed down during the year and service discontinued:—

Three Rivers, P.Q.	Cape Bear, P.E.I. (temporarily).
Heath Point, Anticosti.	Halifax Dockyard.
Point Riche, Nfld.	Partridge Island, N.B.
Harrington, P.Q.	Ikeda Head, Q.C.I.
Cape Ray, Nfld.	Pachena Point, B.C.
Pictou, N.S.	Triangle Island, B.C.

A new station at Bull Harbour, B.C., supplants Triangle Island. The Heath Point Lightship has been fitted with wireless apparatus and will handle messages relating to weather, ice and reports respecting dangers to navigation, formerly dealt with by the station on shore.

The new station at Montreal has been completed, replacing the Tarte Pier Station, which has been dismantled.

Estevan, B.C., station has been enlarged and is now the main coast station for ship traffic. All other Pacific Coast stations will handle inter-station business as well as ships' business. Of the latter stations, Bull Harbour, Cape Lazo and Alert Bay will act as collection points for the traffic originating at the several private commercial stations established throughout the Province in connection with the lumbering and fishing industries.

Projects for a high power station for transpacific communication and a new C.W. station at Vancouver are still in the tentative stage.

Le Pas, Man., and Port Nelson, Hudson Bay, stations, are still closed temporarily.

Long distance service with ships fitted with C.W. apparatus is provided by the Government station at Barrington Passage, N.S., on 2,200 metres. The Marconi Company has also opened a station at Louisburg, C.B., for this class of work and on this wavelength.

Transatlantic service continues to be maintained by the Marconi Company at Glacé Bay, N.S. The second transatlantic station (Poulsen Arc system) at Newcastle, N.B., which was installed to communicate with a similar station at Ballybunion, Ireland, and which is now under the control of the Marconi Company, has not yet been placed in commercial operation.

An outstanding feature of the year's operation is the large increase of amateur experimental licenses granted. This has been brought about, in a great measure, through the establishment of radiophone broadcasting stations, 53 of which have been granted to date.

Pending revision of the Regulations, the following increase in wavelengths has been granted to amateur experimental and experimental stations:—

Amateur Experimental, Spark	..	180 metres.
Amateur Experimental, C.W.	..	200 "
Experimental, Spark	..	180 "
Experimental, C.W.	..	275 "

Formalities with regard to the issue of licenses for "Reception only" have also been dispensed with, and such licenses are now granted to persons of any nationality upon request and payment of the license fee of \$1.00. In order to facilitate the issue of these "Reception only" licenses, arrangements have been made with the Post Office authorities to issue the same as the Post Offices in the principal cities throughout the Dominion.

For the present and until the revised regulations become effective, broadcasting stations are classed as "Public Commercial," and a modified form of public commercial license is granted each station. A band of wavelengths 400 to 450 metres, for allotment in steps of 10 metres, has been reserved for this class of work. In congested districts the respective stations operate on schedule arranged to avoid overlapping of musical or other programmes and the consequent interference.

ADMINISTRATION.

Previous to 1913, radiotelegraphy in the Dominions was regulated by Part 4 of the Telegraph Act. This is now replaced by the Radiotelegraph Act, assented to on the 6th June, 1913. A copy of the Radiotelegraph Act and Regulations issued thereunder, with all amendments to date, is attached hereto. The complete regulations so far as they concern amateur working are at present under revision. The new conditions brought about by broadcasting are also being brought within their scope.

Effective 1st July, 1922, the administration of the Radiotelegraph Act has been transferred from the Department of the Naval Service to the Department of Marine and Fisheries.

- A**—Radiotelegraph Act, 1913.
- B**—Amendment to Radio Regulations.
- C**—Naval Minister's Regulations.
- D**—Extract from Air Regulations, 1919.
- E**—License for Limited Coast Station.
- F**—Public Commercial License.
- G**—Private Commercial License.
- H**—Experimental License.
- I**—Amateur Experimental License.
- J**—Ship License.
- K**—License to use Radiotelegraphy.

L—Amateur Broadcasting License.

M—Experimental Broadcasting License.

N—Private Commercial Broadcasting License.

O—Broadcasting License.

3 & 4 GEORGE V., CHAPT. 43.

AN ACT RESPECTING RADIOTELEGRAPHY STATUTES.

ASSENTED TO 6TH JUNE, 1913.

A His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as the Radiotelegraph Act.

2. In this Act, unless the context otherwise requires—

- (a) "Minister" means the Minister of the Naval Service;
- (b) "radiotelegraph" includes any wireless system for conveying electric signals or messages including radiotelephones;
- (c) "coast station" means any radiotelegraph station which is established on land or on board a ship permanently moored and which is used for the exchange of messages and electric signals with ships at sea;
- (d) "land station" means any radiotelegraph station or installation of radiotelegraphic apparatus which is not a coast station or a ship station;
- (e) "ship station" means any radiotelegraph station established on board a ship which is not permanently moored.

3. No person shall establish any radiotelegraph station or install or work any radiotelegraph apparatus in any place in Canada or on board any ship registered in Canada except under and in accordance with a license granted in that behalf by the Minister.

4. From and after the first day of January, nineteen hundred and fourteen, no passenger steamer, whether registered in Canada or not—

- (a) licensed to carry fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than two hundred nautical miles from one port or place to another port or place; or,
- (b) licensed to carry two hundred and fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than ninety nautical miles from one port or place to another port or place; or,
- (c) licensed to carry five hundred or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than twenty nautical miles from one port or place to another port or place

shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred nautical miles by night and by day, and in charge of a person fully qualified to take charge of and operate such apparatus.

2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section shall, on summary conviction, be liable to a fine not exceeding one

thousand dollars and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

(3) This section shall not apply to passenger steamers plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the Northumberland Straits, or on the Georgian Bay, or on the lakes of Canada other than Lakes Ontario, Erie, Huron and Superior, and the provision of paragraph (c) of sub-section 1 of this section shall not apply to steamers making voyages on Lakes Ontario, Erie, Huron and Superior, the regular route for which is not at any point more than seven miles from the shore.

(4) This section shall not apply to steamers calling at Canadian ports solely for the purpose of obtaining bunker coal or provisions for the use of such steamer, or through stress of weather, or for repairs.

5. All persons operating land or cable telegraph lines shall transmit all messages destined to or coming from ship stations via coast stations under such rules as may be made by the Board of Railway Commissioners for Canada.

6. No one shall be employed as a radiotelegraph operator at any coast or land station unless he is a British subject, and all radiotelegraph operators at shore or land stations, or on ship stations on board any vessel registered in Canada, shall take and subscribe a Declaration of Secrecy in the form set forth in the Schedule to this Act, before a judge of any court, a notary public, a justice of the peace or a commissioner for taking affidavits, having authority or jurisdiction within the place where the oath is administered.

(2) Every person who has made the Declaration of Secrecy and who, either directly or indirectly, divulges to any person, except when lawfully authorised or directed so to do, any information which he acquired by virtue of his employment, is guilty of an offence and shall be liable on summary conviction to a penalty not exceeding one hundred dollars and to imprisonment for a term not exceeding six months.

7. Any person who sends or transmits or causes to be sent or transmitted any false or fraudulent distress signal, message, call or radiogram of any kind, or who without lawful excuse interferes with or obstructs any radio-communication, shall be guilty of an offence and shall be liable on summary conviction to a penalty not exceeding five hundred dollars and costs or six months' imprisonment.

8. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a radiotelegraph station has been established without license in that behalf, or that any apparatus for radiotelegraphy has been installed or worked in any place or on board any ship registered in Canada within his jurisdiction without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Minister and named in the warrant.

(2) A warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any radiotele-

graph apparatus which appears to him to be there used or intended to be there used for radiotelegraphy.

9. Every one who establishes a radiotelegraph station or installs or works any radiotelegraph apparatus in violation of the provisions of this Act, or of any regulation made hereunder, shall be liable on summary conviction to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars and to imprisonment for a term not exceeding twelve months, and in either case shall be liable to forfeit to His Majesty, any radiotelegraph apparatus installed or worked without a licence.

(2) No proceedings shall be taken against any person under this section, except by order of the Minister.

10. The Governor in Council may—

(a) prescribe the tariff of fees to be paid for licences and for examination for certificates of proficiency held and issued under the provisions of this Act;

(b) accede to any international convention in connection with radiotelegraphy, and make such regulations as may be necessary to carry out and make effective the terms of such convention and prescribe penalties recoverable on summary conviction for the violation of such regulations; provided that such penalties shall not exceed five hundred dollars and costs;

(c) make regulations for the censorship and controlling of radiotelegraph signals and messages in case of actual or apprehended war, rebellion, riot or other emergency.

11. The Minister may make regulations—

(a) prescribing the form and manner in which applications for licenses under this Act are to be made;

(b) classifying ship, coast and land stations and prescribing the type and range of the regular equipment and the emergency equipment to be installed in the several classes of stations;

(c) defining the different kinds of licenses that may be issued, their respective forms and the several periods for which they shall continue in force;

(d) prescribing the conditions and restrictions to which the several licenses shall respectively be subject;

(e) prescribing the different classes of certificate of proficiency and the class of certificate necessary to qualify persons as operators for the several classes of ship, coast and land stations;

(f) for the examination of persons desiring to obtain certificates of proficiency as radiotelegraph operators and to determine the qualifications in respect of age, term of service, skill, character and otherwise to be required for such certificates;

(g) prescribing the watches to be kept by operators and the number of operators to be maintained and kept at the different classes of ship, coast and land stations;

(h) for the inspection of radiotelegraph stations;

(i) to provide how radiotelegraph apparatus installed upon any foreign or British ship (whether such British ship is registered in Canada or elsewhere) shall be operated while such ship is within the territorial waters of Canada;

(j) to compel all radiotelegraph stations to receive, accept, exchange and transmit

signals and messages with such other radiotelegraph stations and in such manner as he may prescribe

(k) for the effective carrying out of the provisions of this Act.

(2) The Minister may, by regulation, authorise the imposition of a penalty not exceeding fifty dollars and costs or three months' imprisonment for the violation of any regulation made under this section, and any such penalty may be recovered upon summary conviction.

12. All regulations made under the provisions of the two sections immediately preceding shall be published in *The Canada Gazette*, and shall be laid before both Houses of Parliament within ten days after the publication thereof if Parliament is then sitting, and if Parliament is not then sitting, then within ten days after the next meeting thereof.

13. His Majesty may, at any time, assume, and for any length of time retain, possession of any radiograph station and of all things necessary to the sufficient working thereof, and may, for the same time, require the exclusive service of the operators and other persons employed in working the same; and the person owning or controlling the station shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders, and transmit and receive such signals, calls and radiograms as they are required to receive and transmit by any duly authorised officer of the Government of Canada.

(2) If the Minister and the person owning or controlling any radiotelegraphic station taken possession of by the Crown under the provisions of this section cannot agree as to the compensation to be paid by the Crown for such taking possession, the Minister shall refer the matter to the Exchequer Court of Canada for adjudication.

14. Part IV of the Telegraphs Act is repealed.

SCHEDULE.

DECLARATION OF SECRECY.

I, A. B. solemnly and sincerely promise and declare that I will faithfully and honestly fulfil the duties which devolve upon me as radiotelegraphic operator, and that I will not, either directly or indirectly, divulge to any person, except when lawfully authorised or directed so to do, any information which I acquire by virtue of my employment as such operator, or which may come to my knowledge through the operation of any radiotelegraphic installation.

Declared before me at
this day of 19
[Signature of declarant.]

[Extract from THE CANADA GAZETTE of Saturday,
July 22, 1922.]

DEPARTMENT OF MARINE AND FISHERIES.

B AMENDMENT TO RADIO REGULATIONS, ISSUED UNDER AUTHORITY OF SECTION 10 OF THE RADIOTELEGRAPH ACT, STATUTES, 1913, CHAPTER 43.

Under authority of P.C. 1446 of the 7th July, 1922, Radiotelegraph Regulations Nos. 1 and 2 established by Order in Council P.C. 1386 of the 28th May, 1914, are amended by substituting the following rates of fees, effective from the 30th June, 1922.

FEES FOR LICENSES.

1. The annual fees to be paid in respect of licenses issued by the Minister of Marine and Fisheries for the installation and operation of radiotelegraph stations in the Dominion of Canada, or on board any ship registered in Canada, shall be as follows:—

1. Limited Coast station	\$50.00
2. Public Commercial station	50.00
3. Private Commercial Broadcasting station	50.00
4. Private Commercial station	10.00
5. Experimental station	5.00
6. Amateur Broadcasting station	5.00
7. Amateur Experimental station	1.00
8. Private Receiving station	1.00
9. Technical or Training School station	5.00
10. Ship station	1.00

FEES FOR EXAMINATIONS.

2. The fees to be paid in respect of examinations for "Certificates of Proficiency in Radiotelegraphy and Radiotelephony" shall be as follows, for each examination or re-examination:—

1. Extra First-class certificate	\$5.00
2. First-class certificate	2.50
3. Second-class certificate	1.00
4. Third-class certificate	1.00
5. Experimental certificate	2.50
6. Amateur certificate .. ..	.50
7. Emergency certificates, any class	5.00
8. Radiotelephone certificate	2.50

RADIOTELEGRAPH REGULATIONS.

ISSUED BY THE MINISTER OF THE DEPARTMENT OF MARINE AND FISHERIES IN ACCORDANCE WITH SECTION II OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

The old Regulations Numbers 1 to 32, inclusive, 72, 75, 76, 77, 78, 88 (a) and 97, are hereby cancelled, and the new Regulations set out below are substituted therefor, effective 1st September, 1922:—

LICENSES.

1. *Nationality of Licenses.*—Licenses for "Transmitting stations" are issued only to British Subjects or to companies incorporated under the laws of the Dominion of Canada or any of the Provinces thereof.

Licenses for "Private Receiving Stations" are issued to any person in Canada irrespective of nationality.

2. *Issue of Licenses.*—Licenses for "Private Receiving Stations" are issued by the Department of Marine and Fisheries, Ottawa, by Departmental Radio Inspectors, and by the Postmasters of the larger towns and cities in the Dominion of Canada.

Licenses for all other classes of stations are issued by the Department of Marine and Fisheries, Ottawa, only.

Applications for Licenses for other than "Private Receiving Stations" should be made on the form "Application for Licenses" provided for that purpose, copies of which may be obtained directly from the Department or from any Departmental Radio Inspector.

3. *Classes of Licenses.*—Licenses for the following classes of stations may be issued:—

Coast Stations—

Limited Coast Station.

Land Stations—

Public Commercial Station,
Private Commercial Broadcasting Station,
Private Commercial Station,
Experimental Station,
Amateur Broadcasting Station,
Amateur Experimental Station,
Private Receiving Station,
Technical or Training School Station.

Ship Stations—

Ship Station.

4. *Duration of Licenses.*—Licenses will be valid for one year, commencing on April 1st and expiring on March 31st of the following year. All licenses issued during the year automatically expire on March 31st, unless otherwise specified in the license.

5. *Limited Coast Licenses.*—Limited coast licenses may be granted with respect to stations in localities not served by a regular Government coast station; such stations will be allowed to undertake a limited correspondence with ships at sea determined by the object of such correspondence. They must exchange public messages with such ships, coast and land stations, as are designated in the license, but with no other stations whatsoever.

For ship to shore working they must be operated in accordance with the provisions of the International Radiotelegraph Convention, and they must use such wavelengths as are specified in the license.

The watches to be maintained and the number and class of operators to be carried are to be as specified in the license, the regular form of which is annexed hereto (Form No. W. 42).

6. *Public Commercial Licenses.*—Public commercial licenses may be granted to land stations open for public correspondence with certain other land stations designated in the license.

The wavelengths to be used, the watches to be maintained and the number and class of the operators to be carried are to be specified in the license, the regular form of which is annexed hereto (Form No. W. 18).

Public commercial licenses are also granted for receiving stations established for purposes of gain, such as receiving stations installed in theatres, halls, etc., for the purpose of giving radiotelephone concerts and for which an admission charge is made. The regular form of license is annexed hereto (Form No. W. 68).

7. *Private Commercial Broadcasting Licenses.*—Private commercial broadcasting licenses may be granted to land stations to be operated for the broadcasting by radiotelegraph or radio telephone of news, information, entertainment or other service.

No tolls shall be levied or collected on account of any service performed by this class of station.

The working of the station must be strictly limited to the hours prescribed in the license and the station must use such wavelength as is specified therein.

The station must be operated by a person who is the holder of a "First Class" or a "Radio telephone" Certificate of Proficiency in Radio.

The regular form of the private commercial broadcasting license is annexed hereto (Form No. W. 69).

8. (i) *Private Commercial Licenses.*—Private commercial licenses may be granted to land stations to be operated in connection with the private correspondence of the licensee. Such stations will be limited to certain specific services which will be defined in the license. Such stations shall not exchange messages with stations other than those specified in the license, and except in the special case provided for in Section (ii) of this regulation, no tolls shall be levied or collected on account of any business transacted, or messages sent to or from the station. This class of station must use such wavelengths as are specified in the license. The watches to be maintained and the number and class of operators to be carried shall be as specified in the license, the regular form of which is annexed hereto (Form No. 43).

(ii) In the case of private commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Minister may prescribe that the licensed station must accept messages to and from the public, and communicate with such stations as may be designated. In this event, the licensee shall be entitled to collect a toll for the handling of such public correspondence, the amount of such toll to be as approved by the Board of Railway Commissioners and as specified in the license.

(iii) The Minister at his discretion may authorise the licensed station to communicate with certain specified ship stations when such ship stations are within certain areas or localities to be specified in the license. Messages handled with such ships must be limited exclusively to the business of the licensee and no coast station charge shall be levied in respect of such messages.

9. *Experimental Licenses.*—Experimental licenses will be granted to stations intended for purely experimental purposes and operated with a view to the advancement of the art of radio. Applicants for such licenses must state their technical attainments and the general lines on which they propose to pursue their investigations. It should be observed that the fact that the applicant desires to conduct experiments with his equipment frequently does not justify or require a license of this class, as most experiments can be conducted within the limitations of an "Amateur Experimental License" or by the use of an artificial aerial.

In addition to the provisions contained in the regular form of experimental license annexed hereto (Form No. W. 20) the following special regulations will apply to all experimental stations.

SPECIAL REGULATIONS FOR EXPERIMENTAL STATIONS.

10. Applicants for an experimental license must state in their application the wavelength or wavelengths they desire to use. The normal wavelengths for experimental stations are 175 metres spark and 275 metres C.W., and radiotelephone. In addition the licensee is authorised to use for special work such other wavelengths as are prescribed in the license.

11. When transmitting on wavelengths of 275 metres or less the station must be worked by a person holding an "Amateur Experimental" or a higher grade of Certificate of Proficiency (see Regulation No. 97), and when transmitting on wavelengths greater than 275 metres it must, if it be within the range of any commercial or coast station, be worked by a person holding either a "First Class," "Second Class," or "Experimental" Certificate of Proficiency in Radiotelegraphy (see Regulations Nos. 93, 94 and 96).

12. The power used, measured at the terminals of the transformer, or generator, will normally be limited to $\frac{1}{2}$ kW.

In special cases, however, such as that of a commercial company desirous of testing and demonstrating apparatus, or of stations so far removed from any commercial station or route of navigation as to preclude any possibility of interference, the Minister may at his discretion permit the use of greater powers than $\frac{1}{2}$ kW.

13. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the license.

14. A distinctive call signal will be allotted to each station, commencing with the figure 9, e.g., 9AAA, etc. This signal is to be transmitted twice at the termination of every transmission.

15. The regulations of the International Radiotelegraph Convention must, where applicable, be observed at the station.

16. The station, when operating, must listen for the signal "STP" which will indicate that an experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, experimental stations will absolutely cease to operate until the Government station gives the signal "Cancel STP."

17. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken.

18. When a licensed station is located near a commercial station it must be provided with a connection with the local telephone exchange so that prompt communication may be established in case of interference.

19. *Amateur Broadcasting Licenses.*—Amateur Broadcasting Licenses may be granted to recognised radio associations. They will not be granted to individuals. Such licenses will permit broadcasting on a wavelength of 250 metres at the hours and for the periods prescribed in the license.

The normal range of amateur broadcasting stations will be limited to 25 miles.

An association licensed to operate an amateur broadcasting station may, subject to the approval of the Minister, authorise a station belonging to one of its members to broadcast on its behalf, such station whilst broadcasting shall use the call signal and wavelength allotted to the association. The association will be held responsible for the proper operation of the station in accordance with the provisions of the license and the radio regulations.

20. *Amateur Experimental Licenses.*—Amateur experimental licenses may be granted to small stations used for instruction, amusement or experimental purposes.

In addition to the provisions contained in the regular form of amateur experimental license annexed hereto (Form No. W. 44), the following special regulations will apply to all amateur experimental stations:—

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.

21. The normal transmitting wavelengths for amateur experimental stations are as follows:—

Spark, 175 metres.

Continuous wave and radiotelephone, 150, 175, 200 and 225 metres.

The power used measured at the terminals of the transformer or generator, must not exceed $\frac{1}{2}$ kW.

22. Amateur experimental stations must be so operated as not to interfere with the working of any Government or commercial, coast, land or ship station. In the event of interference by an amateur experimental station the Department will limit the power and wavelength authorised for such station. In the event of continued interference by an amateur experimental station the department will cancel the license issued for such station.

23. The station must be worked by a person holding an amateur experimental certificate of proficiency (see Regulation No. 97).

24. (a) The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the license.

(b) The use of plain aerial or other untuned highly damped spark transmitters is not allowed.

25. A distinctive call signal will be allotted to each station, commencing with a figure, e.g., 3AA, etc., which signal must be sent not less than three times at the termination of every transmission.

26. The regulations of the International Radiotelegraph Convention must, where applicable, be observed by the station.

27. Broadcasting by amateur experimental stations is not permitted (see Regulation 19 for Amateur Broadcasting License).

28. The station, when operating, must listen for the signal. On receipt of the "STP" signal, all amateur experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP".

29. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

30. When the licensed station is in the vicinity of a commercial station it should be connected with the local telephone exchange so that instant communication may be established in case of interference.

31. *Private Receiving Licenses.*—Private receiving licenses will be granted for stations to be established for "reception only" and which are not used for the purpose of gain.

Receiving stations when using a receiver of the regenerative type for the reception of organised radiotelephone programmes must avoid increasing regeneration to the point at which the receiver begins to oscillate.

32. *Technical and Training School Licenses.*—Technical and training school licenses will be granted to stations intended for educational purposes; they will be afforded every facility for the work they propose to undertake compatible with any special local conditions such as the existence of a Government or commercial station in their vicinity; in general they will be subject to the same conditions as experimental stations and amateur experimental stations.

33. *Ship Station Licenses.*—Ship station licenses will be granted to stations on British ships registered in Canada.

The regular form of the license is annexed hereto. (Form No. W. 19.)

CLASSIFICATION OF SHIP STATIONS.

Ship Stations will be classified as follows:—

34. *Class 1.*—All "sea-going" passenger vessels registered in Canada with an average

speed of 15 knots or more, carrying 50 or more persons and plying between ports more than 200 miles apart; also all "sea-going" passenger vessels registered in Canada with an average speed of 13 knots or more, carrying 200 or more persons and plying between ports more than 500 miles apart.

35. *Class 2a.*—All "sea-going" passenger vessels registered in Canada affected by the provisions of Section 4 of the Radiotelegraph Act, which do not come under Class 1.

Class 2b.—All vessels registered in Canada plying on "coasting voyages" or on the "inland waters" of Canada which are affected by the provisions of Section 4 of the Radiotelegraph Act.

36. *Class 3.*—All vessels registered in Canada not affected by the provisions of Section 4 of the Radiotelegraph Act, but which have been voluntarily equipped with radiotelegraph apparatus.

The terms "sea-going," "coasting voyage," and "inland waters" are to be as defined in Section 72 of the Canada Shipping Act, Chapter 113, R.S. 1906.

REGULAR EQUIPMENT.

37. *Vessels in Class 1.*—The regular radiotelegraph equipment must have a minimum range of 100 nautical miles at all hours of the day and night with a similar equipment on a similar vessel and with all Canadian Government coast stations.

38. The normal wavelength of the emitted wave must be 600 metres; in addition the set must be capable of being operated on a wavelength of 300 metres, and means are to be provided whereby a quick change-over from one wavelength to the other may be effected.

39. In the case of small vessels on which it is materially impossible to use a transmitting wavelength of 600 metres, 300 metres may be employed; such ship stations, however, must be fitted with a receiver capable of tuning up to a 600 metre wavelength and the watches must be maintained on that wavelength.

40. The logarithmic decrement of a complete oscillation must not exceed two-tenths (0.2).

41. The power used by the transmitter, measured at the terminals of the generator of the station, must not, under normal circumstances, exceed 1 kw., except in the special case provided for in Article 35, paragraph 2, of the International Radiotelegraph Convention of London, 1912.

42. In the case of equipments using a power of more than 50 watts, an arrangement must be provided whereby several ranges, each less than the normal range, may be speedily obtained, the shortest range being, approximately, 15 nautical miles.

43. The use of "plain aerial" except in cases of distress or in installations using a power of less than 50 watts, is prohibited.

44. *Vessels in Class 2.*—Regulations No. 37 to No. 43, inclusive, shall apply to the equipments on vessels in Classes 2a and 2b.

45. *Vessels in Class 3.*—Regulations No. 38 to No. 43, inclusive, shall apply to equipments on vessels in Class 3.

EMERGENCY EQUIPMENTS.

46. *Class 1.*—Every vessel in Class 1 must carry an emergency source of power, instantly available, which shall be capable of operating the equipment for six hours, under normal conditions, with a minimum range of 80 nautical miles.

47. *Class 2.*—Vessels in Classes 2a and 2b must carry a similar source of power with the exception that the minimum normal range of the equipment is reduced to 50 nautical miles.

48. *Class 3.*—Vessels in Class 3 will not be required to carry emergency sets.

49. *Emergency Equipments Generally.*—(1) The emergency equipment in its entirety must be in all cases be placed in the upper part of the ship, as high as practicably possible and in a position of the greatest safety.

(2) The emergency equipment may take the form of complete transmitter. Storage battery sets, of sufficient capacity to operate the regular radiotelegraph equipment of the vessel for the specified time, are, however, strongly recommended.

(3) A plain aerial transmitter may be installed as an emergency equipment, provided (subject to the provisions of Regulation No. 43) the use of the same is confined exclusively to distress calls.

(4) Regulations No. 46 to No. 49, inclusive, will become effective on and after December 1st, 1914.

50. *Spare Parts.*—Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

51. *Certificate of Inspection.*—The radiotelegraph installation on all British vessels registered in Canada will be subject to inspection by an officer of the Department of the Naval Service at least once a year, who, if the apparatus is found to comply with the terms of the Radiotelegraph Act and the regulations issued thereunder, shall issue to the vessel a "Radiotelegraph Inspection Certificate" certifying that the equipment has been duly inspected and that it complies with the provisions of the license issued therefor by the Minister of the Naval Service, such certificate to be posted in the radiotelegraph cabin.

52. *Time.*—Radiotelegraph stations on vessels plying on the West Coast shall observe Pacific time, and those on the Great Lakes and East Coast Eastern Standard time.

WATCHES.

53. *Vessels in Class 1.*—A constant watch must be maintained at the radiotelegraph stations on all vessels in Class 1 (Regulation No. 34) whilst they are en route, and two operators, holding first-class certificates, must be carried on such vessels.

54. *Vessels in Class 2a.*—A constant watch from 8 a.m. to 3 p.m. and a watch during the first ten minutes of every other hour of the day must be maintained at the radiotelegraph stations on all vessels in Class 2a (Regulation No. 35) whilst they are en route; the ten-minute watch may be maintained by an operator holding a "Second-class Certificate of Proficiency," or by a person holding a regular "Third-class Certificate."

55. *Vessels in Class 2b.*—Watches as herein-after specified in Regulations No. 57 to No. 67, must be maintained at the radiotelegraph stations on all vessels in Class 2b, whilst they are en route.

56. (1) *Vessels in Class 3.*—No fixed watches need be maintained at radiotelegraph stations on vessels in Class 3 (Regulations No. 36) when plying on a coasting voyage or on the Great Lakes on the runs specified in Regulations 57 to 62.

(2) Vessels in Class 3 plying on transoceanic voyages, and carrying one operator, must keep watches as specified in Regulation 56a.

56a. Vessels carrying one operator, and plying on runs not covered by Sections 57 to 62, must whilst en route maintain watches as follows:—

Belt A.—East Atlantic and European.

From Long. 30° W. to Long. 30° E.,
including Baltic, Mediterranean and
Black Seas.
0800 to 1000
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt B.—Indian Ocean.

From Long. 30° E. to Long. 90° E.,
including Red Sea and Persian Gulf.
0000 to 0200
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt C.—Australasian (Western).

From Long. 90° E. to Long. 160° E.
0000 to 0200
0400 to 0600
1200 to 1400
2000 to 2200

Belt D.—Australasian (Eastern).

From Long. 160° E. to Long. 140° W.
0000 to 0200
0400 to 0600
0800 to 1000
2000 to 2200 G.M.T.

Belt E.—East Pacific.

From Long. 140° W. to the Western
Coast of America, thence southward
along Long. 70° W.
0000 to 0200
0400 to 0600
1600 to 1800
2000 to 2200 G.M.T.

Belt F.—West Atlantic.

From Eastern Coast of America, and
Long. 70° W. (South of Cape Horn)
to Long. 30° W.
0000 to 0200
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

PACIFIC COAST.

57. *Class 2b—Local Coasting Runs.*—Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and not steaming for more than 16 hours in any day, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m. and the last half-hour
of every hour until 8.00 p.m.
9.30 p.m. to 10.00 p.m.
11.30 p.m. to 12.00 midnight.
3.30 a.m. to 4.00 a.m.
5.30 a.m. to 6.00 a.m.

In the case of vessels affected by Sub-section (c) of Section 4 of the Radiotelegraph Act (500 persons—ports more than 20 miles apart), the above watches need only be kept whilst the boats are en route between ports more than 20 miles apart.

58. Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 57, with the exception that a watch may be maintained from 1.30 a.m. to 2.00 a.m.

instead of from 3.30 a.m. to 4.00 a.m., and no watch need be kept between the hours of 2.00 a.m. 9.30 a.m.

59. *Class 2b—Coasting Vessels Plying North and South.*—Vessels in Class 2b plying on runs between ports in British Columbia south of Queen Charlotte Sound and ports in the same province north of that Sound, or *vice versa*, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m.

10.30 a.m. to 11.00 a.m.

1.30 p.m. to 2.00 p.m.

4.30 p.m. to 5.00 p.m.

7.30 p.m. to 8.00 p.m.

10.30 p.m. to 11.00 p.m.

If, during these periods, the vessel is in the immediate vicinity of any place mentioned in the lists given in Regulations 60 and 61, communication must be established with the coast station shown, or should the vessel reach such vicinity out of the above periods the ship station must call such coast station until communication is established or it becomes out of range.

60. *North Bound:—*

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Gonzales Hill	Trial Island	Trial Island
Point Grey	The First Narrows or Abeam Porlier Pass	The First Narrows or Abeam Porlier Pass.
Cape Lazo	Abeam	
Alert Bay	Cape Mudge	Cape Mudge.
"	Blinkensop Bay	
"	Abeam	Abeam.
"	Pine Island	Pine Island.
Triangle Island	"	
"	Egg Island	Egg Island.
"	Before reaching Harold Point	Before reaching Harold Point.
"	Ivory Island	Ivory Island.
Digby Island	Vancouver Rock	
"	Watson Rock	Watson Rock.
"	Abeam	Abeam.
"	Hodgson Island	
"	Pointers	Pointers

61. *South Bound:—*

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Digby Island	Pointers	Pointers.
"	Hodgson Island	
"	Abeam	Abeam.
"	"	
"	Lawyer Island	Lawyer Island.
Triangle Island	Vancouver Rock	Vancouver Rock.
"	Ivory Island	
"	Harold Point	Harold Point.
"	Egg Island	Egg Island.
"	Pine Island	Pine Island.
Alert Bay	"	"
"	Abeam	
"	Blinkensop Bay	Blinkensop Bay.
Cape Lazo	Chatham Point	
"	Abeam	Abeam.
Point Grey	Sisters	Sisters.
"	Abeam	Abeam.
Gonzales Hill	Active Pass	Active Pass.

GREAT LAKES AND EAST COAST.

62. *Class 2b—Vessels Plying on the Great Lakes and on Coasting Voyages on the East Coast.*—Vessels in Class 2b plying on voyages of more than 300 miles between terminal ports on the Great Lakes or East Coast must maintain watches whilst en route as follows:—

7.00 a.m. to 7.30 a.m.

10.00 a.m. to 10.30 a.m.

1.00 p.m. to 1.30 p.m.

4.00 p.m. to 4.30 p.m.

7.00 p.m. to 7.30 p.m.

10.00 p.m. to 10.30 p.m.

Communication must also be established with each coast station when abeam, irrespective of whether such position is reached during the above periods or not.

63. *Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between terminal ports and not steaming for more than 16 hours out of the 24, must maintain watches whilst en route as follows:—*

8.00 a.m. to 8.30 a.m. and the first half-hour of every hour until 8.30 p.m.

10.00 p.m. to 10.30 p.m.

12.00 p.m. to 12.30 a.m.

4.00 a.m. to 4.30 a.m.

6.00 a.m. to 6.30 a.m.

64. *Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between ports and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 63, with the exception that 2.00 a.m. to 2.30 a.m. is substituted for 4.00 a.m. to 4.30 a.m., and no watch need be kept between the hours of 2.30 a.m. and 10.00 a.m.*

66. *Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and not steaming more than 10 hours out of the 24 must, whilst en route, maintain a constant watch.*

67. *Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and steaming for more than 10 hours in the 24 must, whilst en route, maintain watches as prescribed in Regulation No. 64.*

OPERATION.

68. *Power Available.*—Power for the operation of the main equipment shall be available during the periods a watch is being maintained under Regulations No. 53 to No. 67.

69. *Control of Ship Stations.*—The operation of the radiotelegraph station on any vessel shall be under the supreme control of the master of such vessel.

70. *Censorship by the Master of a Vessel.*—The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radiotelegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

71. *Form W. 40.*—A copy of Form W. 40 must be posted in every radiotelegraph station; these forms may be obtained from the Deputy Minister of the Naval Service on request,

72. *Secrecy of Messages.*—(a) No message shall be delivered, or its contents divulged, to any person except the addressee, his or her accredited agent, or such properly authorised persons as are essential for the forwarding of such message to its destination.

(b) Any person who makes any use of any message or the contents thereof which has been delivered or divulged to him or her in violation of Regulation No. 72 (a), shall be liable on summary conviction to the penalty prescribed for the violation of these regulations.

73. *Superfluous Signals.*—The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

74. *Profane Language.*—No person shall transmit or make a signal containing profane words or language.

OPERATORS.

75. *Operators.*—The apparatus of all coast, land or ship stations, other than private receiving stations, must only be worked by persons holding regular Certificates of Proficiency in Radio, and who have subscribed to a Declaration of Secrecy, as prescribed in Section 6 of the Radiotelegraph Act.

76. *British Subjects.*—All operators on coast, ship or land stations must be British Subjects, and the different classes of stations must be worked by operators holding Canadian "Certificates of Proficiency" (subject to the provision of Section 77) not inferior to those hereinafter prescribed in Regulations No. 80 to 86, for the respective classes of stations.

77. *Ship Stations.*—The holders of Certificates of Proficiency in Radio issued in accordance with the provisions of the International Radiotelegraph Convention by His Majesty's Postmaster-General, the Administration of any British self-governing Dominion or Colony, or the Government of India, will (subject to the provisions of these regulations) be entitled to act as radio operators on any Canadian vessel so long as operators holding Canadian certificates are accorded similar privileges in respect of vessels belonging to such administrations.

78. *Certificates of Proficiency.*—The following Certificates of Proficiency in Radio are issued by the Department;—

Ship Stations—

- (1) First Class Certificate.
- (2) Second Class Certificate.
- (3) Third Class (Watcher's) Certificate.
- (4) Emergency Certificate.
- (5) Radiotelephone Certificate.

Land and Coast Stations—

- (6) Extra First Class Certificate.
- (7) First Class Certificate.
- (8) Second Class Certificate.
- (9) Third Class Certificate.
- (10) Emergency Certificate.
- (11) Radiotelephone Certificate.
- (12) Experimental Certificate.
- (13) Amateur Experimental Certificate.

79. *Emergency Certificates.*—In case of emergency in which it is impossible for an operator to attend a regular examination, the Minister may hold an emergency examination and shall have power to issue emergency certificates of any class. Such certificates shall not be valid for more than six months.

Any person holding an emergency certificate of proficiency must promptly apply for permission to attend an examination as provided by Regulation 87, and when notified of the date and place of examination he is hereby further

required to attend a regular examination for a certificate of proficiency within the requirements of Regulations 89 to 97 inclusive, and the said emergency certificate shall expire and cease to be of effect on the day on which the result of such regular examination is published.

OPERATORS TO BE CARRIED.

80. *Ships in Class 1.*—Ships in Class 1 must carry two operators holding First-class Certificates.

81. *Ships in Class 2a.*—Ships in Class 2a must carry two operators, one First-class and one Second-class, or one First-class and one Third-class.

82. *Ships in Class 2b.*—Ships in Class 2b must carry one First-class operator.

83. *Ships in Class 3.*—Ships in Class 3, if they undertake public correspondence, must carry one First-class operator or, if their service is limited exclusively to the ship's business, one Second-class operator.

84. *Coast Stations.*—(1) All public coast stations open for public correspondence and maintaining a constant watch must carry three operators, each of whom must hold a Canadian First-class Certificate of Proficiency. The Minister shall, however, have power in special cases to permit the employment of other persons on such stations for the purpose of maintaining the constant watch above mentioned, provided such persons are capable of transmitting and receiving in the Morse Code at a speed of twenty words a minute, as prescribed in Sub-sections (a) and (b) of Regulation No. 89 and provided the station is in charge of an operator holding a First-class Certificate of Proficiency.

(2) This regulation will become effective on and after the 1st of January, 1915.

85. All other coast stations shall carry such operators holding such certificates as are specified in the license issued for the station under Regulation No. 4.

86. *Land Stations.*—Land stations (commercial, experimental, etc.) shall carry such operators holding such certificates as are specified in the license issued for the station under Regulations Nos. 5, 6, 7, 18 or 32, according to the classification of the station.

EXAMINATION FOR RADIOTELEGRAPH CERTIFICATES OF PROFICIENCY.

87. *Applications.*—Applications for permission to attend examinations for any certificate of proficiency must be made to the Deputy Minister of the Naval Service on the special form provided for that purpose (W. 13). The date and place of examination will be notified to the candidate as soon as possible after receipt of the application.

PERSONS ELIGIBLE TO ATTEND EXAMINATIONS.

88. (a) No person shall be permitted to attend examination for any of the following classes of Certificates of Proficiency in Radio:—

Ship Stations—

First Class Certificate,
Second Class Certificate,
Third Class (Watcher's) Certificate,
Emergency Certificate,
Radiotelephone Certificate.

Land and Coast Stations—

Extra First Class Certificate,
First Class Certificate,
Second Class Certificate,
Third Class (Watcher's) Certificate,
Emergency Certificate,
Radiotelephone Certificate,

- (i) Who is not a natural born British Subject;
- (ii) Who has at any time been of enemy nationality;
- (iii) Whose parents or either of them have at any time been of enemy nationality.

Provided, however, that any naturalised British Subject who has not or whose parents or either of them have not at any time been of enemy nationality may be admitted to examination if his application be approved by the Minister of the Department of Marine and Fisheries.

(b) Candidates for examination for first-class Certificates of Proficiency must be not less than eighteen years of age.

(c) For the purpose of this regulation a person shall be deemed to be of enemy nationality if he has at any time been the subject of a state with which Great Britain has been at war within the period of ten years immediately preceding the 15th day of October, A.D. 1919.

SHIP STATIONS.

89. *First-class Certificate.*—Candidates for first-class certificates will be examined in the following subjects:—

- (1) Transmission and reception at a speed of twenty words a minute;
- (2) Adjustment, care and operation of apparatus;
- (3) The regulations applicable to the exchange of radiotelegraph traffic. The examination will consist of two sections "Practical" and "Written":—

"Practical" Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at not less than the prescribed speed (viz., twenty words a minute, five letters being counted as one word); the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account.

(b) To receive and write legibly for not less than five consecutive minutes at the prescribed speed from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraph reception.

(c) To connect up the apparatus with the help of a diagram of connections.

(d) To name the principal parts of the apparatus.

(e) To mention the most common faults which develop in the apparatus of the set in which he is being examined and the means usually taken to remedy them.

(f) To trace, locate, and remedy several such faults.

(g) To adjust the apparatus after it has been placed out of adjustment.

(h) To change the wavelength of the transmitter from 300 to 600 metres and vice versa.

(i) To reduce or increase the transmitting power.

"Written" Section.

(j) To complete a diagram of connections of the set in which the candidate is being examined.

(k) To answer seven technical questions on the equipment, including storage battery and emergency set, if any.

(l) To answer nine questions on the methods of handling radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications as set out in the latest edition of the British Postmaster-General's Handbook and the service regulations annexed to the International Radiotelegraph Convention in force; the questions will also include the counting, checking and computation of tolls on three test messages. The candidate will also be required to have a thorough knowledge of the use of the "C.P.R.," "Western Union," and "G.N.W." tariff books and the "Official List of Radiotelegraph Stations" issued by the International Telegraph Bureau. Given these books, he will be required to compute the charges on a test message from any ship *via* any Canadian coast station to any telegraph office in the world.

90. *Second-class Certificate.*—Candidates for second-class certificates must pass a satisfactory examination on all the subjects prescribed for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute. Holders of this certificate will only be allowed to operate stations on ships in Classes 2a and 3, as specified in Regulations Nos. 81 and 83.

91. *Third-class Certificate.*—Third-class (Watcher's) certificate will authorise the holder to work at one station only, the name and call signal of which will be designated in the certificate.

The examination will be practical and *viva voce* and the candidate will be required:—

(1) To distinguish from other signals the call signal of the station designated in the certificate, when it is repeated several times, at the rate of ten words a minute;

(2) To distinguish from other signals the distress call "SOS" when it is repeated several times, at the rate of ten words a minute;

(3) To adjust the receiver for incoming signals on the wavelength normally used;

(4) To test the detector with a buzzer or other testing appliances and to adjust it for the efficient reception of signals on the normal wavelength.

COAST AND LAND STATIONS.

92. *Extra First-class Certificate.*—Candidates for Extra First-class Certificates, in addition to taking a thorough examination on the subjects set out in sections (c) to (l) of Regulation No. 89, will be required:—

"Practical" Section.

(a) To send and receive in the International Morse Code for five minutes at a speed of not less than twenty-five words a minute, under the conditions prescribed in sections (a) and (b) of Regulation No. 89;

(b) To trace, locate and remedy faults in standard radiotelegraph installations, of not less than five kilowatt power, including valve detector, gasoline engines, D.C. and induction motors and to adjust the same for efficient operation.

(c) The practical use of a wavemeter.

* The "Postmaster-General's" Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section may be obtained from the department of the Naval Service, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

"Written" Section.

(d) To answer seven questions on the principles governing the working of radiotelegraph installations, internal combustion engines and dynamo electric machinery, in connection with radiotelegraph installations;

(e) To answer seven questions on the International Radiotelegraph Convention and regulations annexed thereto, the Regulations issued by the Minister of the Naval Service and the procedure governing the obtaining of bearings from Direction Finding stations, the general organisation of a radiotelegraph service, including the procedure followed in connection with the transfer of business to and from land lines and the handling of radiotelegraph abstracts and accounts.

The holder of an extra first-class certificate will be authorised to operate on any Canadian coast, land or ship station.

93. *First-class Certificate.*—The examination for the first-class coast certificate will be similar in all respects to that for the first-class ship station certificate, with the exception that the candidate will be required to have a knowledge of the care and operation of gasoline engines.

94. *Second-class Certificate.*—The examination for the second-class coast certificate will be similar to that for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute.

95. *Third-class Certificate.*—The examination for the third-class coast certificate will be similar to that for the third-class ship certificate.

96. *Experimental Certificate.*—Candidates for an experimental certificate will be required:—

"Practical" Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word; the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account;

(b) To receive and write legibly for not less than five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word, from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraphic reception, and to distinguish the signals "SOS," "STP," and his own call signal from among other signals, when sent at a speed of twenty words a minute;

(c) To reduce the transmitting power;

(d) To change the wavelength of the transmitter within the limits prescribed in the license issued for the station;

(e) To adjust the apparatus after it has been placed out of adjustment.

"Written" Section.

(f) To complete a diagram of connections of the set in which the candidate is being examined;

(g) To answer seven technical questions on the equipment, including storage battery and emergency set, if any;

*(h) To answer nine questions on the procedure governing the handling of radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications, particularly as set out in part 5, sections 60 to 91 of the Postmaster-General's Handbook for Wireless Telegraph Operators, section 6, articles 20 to 35 of the regulations annexed to the International Radiotelegraph Convention, and the Minister's Regulations applicable to the operation of experimental stations.

*97. *Amateur Experimental Certificate.*—Candidates for an amateur certificate will be examined in the adjustment and operation of the apparatus they propose to operate and will be required to have a satisfactory knowledge of the Departmental regulations governing the working of amateur experimental stations (Regulations Nos. 19 to 31), and those annexed to the International Radiotelegraph Convention of London, applicable to the working of stations generally, particularly Section 6, articles 20 to 35, entitled "Transmission of Radiotelegrams." The examination will be practical and *viva voce*, and the candidates will be required to send and receive in the International Morse Code at a speed of not less than ten words a minute and to distinguish from other signals the signals "SOS", "STP" and the "call signal of his station, when repeated several times at a speed of ten words a minute." W. 68 (Est'd. May, 1922)

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EXAMINATIONS GENERALLY.

98. *Places at which examinations will be held.*—Examinations will generally be conducted at the Department of the Naval Service, Ottawa; special arrangements will, however, be made where circumstances permit for holding an examination at any radiotelegraph station or any technical school of telegraphy at which suitable apparatus is provided for the purpose.

99. The certificates of proficiency will indicate the system or systems of radiotelegraphy under which the candidate's examination was conducted.

100. *Failure to Pass.*—In case of failure a candidate will not ordinarily be re-examined until after the lapse of three months. An additional fee will be payable in respect of the further examination.

101. *Suspension of Certificate.*—Should it be proved to the satisfaction of the Minister that the holder of a "Certificate of Proficiency" has wilfully or negligently failed to comply with the provisions of the International Radiotelegraph Convention and Regulations, or of these regulations, or of any other regulations which may be issued from time to time for his guidance, the certificate may, at the discretion of the Minister, be suspended or cancelled.

*The Postmaster-General's "Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section, may be obtained from the Department of Marine and Fisheries, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

INSPECTION OF STATIONS.

102. *Inspection.*—Any duly authorised officer of the department may, from time to time, and at all reasonable times, enter upon any coast, land or ship station, within the jurisdiction of Canada, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such station, also the working and user of such apparatus and telegraphic instruments, and all books and papers used in connection with the operation of such station. His authority will be in the form of a letter signed by the Deputy Minister of the Department of the Naval Service.

OPERATION OF SHIP STATIONS WITHIN THE TERRITORIAL WATERS OR HARBOURS OF CANADA.

103. *Ship Stations in Territorial Waters.*—The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked while such ships are within the Territorial Waters of Canada, unless specific permission is granted thereof by the controlling Canadian coast stations for the locality, and then only provided such working does not interfere with the operation of any coast station established in Canada, and that the provisions of the Radiotelegraph Convention of London, 1912, and the Service Regulations annexed thereto are strictly observed.

104. *Ship Stations in Harbours.*—(a) The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked whilst such ships are within a harbour of the Dominion of Canada, except as follows:—

(i) When direct communication by messenger, visual signals or other method between ship and shore is impracticable and then only for the purpose of exchanging with the nearest coast station messages relating exclusively to the business of the ship.

(ii) For the purpose of making or answering signals of distress.

(b) For the proper enforcement of the above, ships in Canadian harbours shall, if so instructed by a Canadian Government Radiotelegraph Inspector, or other properly authorised officer, completely disconnect the aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, in such a manner as to show they are properly disconnected.

105. *Penalty.*—Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

EXTRACT FROM AIR REGULATIONS, 1919.

110. "No person shall install or work a radiotelegraph or telephone apparatus in any aircraft primarily registered in Canada, except in accordance with the terms of a licence granted by the Minister of the Naval Service, and no person shall work any radiotelegraph or telephone apparatus on any aircraft, except in accordance with the provisions of the International Radiotelegraph Convention and the Service Regulations annexed thereto."

W. 42.

LIMITED COAST STATION LICENSE
License No.

Date 19

DOMINION OF CANADA.
LICENSE TO USE RADIOTELEGRAPHY.

E Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph coast station situated at

for the term of one year commencing on the first day of April, 19 and terminating on the thirty-first day of March, 19, and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars (\$10), being the license fee for the privilege above named.

This license is subject to the Act and Regulations above referred to and to the following terms, conditions and restrictions:—

1. In this license the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i) The licensee shall not establish, instal, or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The use of the licensed apparatus shall except in cases of distress, be limited to the exchange of messages with such stations, vessels or lines of vessels as are specified in the schedule.

(iii) No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed those fixed by the International Radiotelegraph Convention of London, 1912.

3. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) With respect to any alternation of messages which the Minister may think necessary;

(c) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths, except when sending distress calls or messages relating to vessels in distress.

6. The licensee shall instal the apparatus at the station mentioned in the schedule, and the said station shall be placed in operation within months from the date of this license, and shall be kept in operation continuously during the hours specified in the schedule, until this licence shall expire.

7. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

8. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day), as may be specified by the Minister.

9. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

10. Subject to the provisions of this license, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any other station or to and from any ship without regard to the particular system of radiotelegraphy installed at such other station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

11. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service (including messages to and from ships of His Majesty's Royal Navy or Canadian Government vessels), such messages shall have priority over all other messages (except messages of distress) and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

12. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

13. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of form No. W. 40 issued by the Department of the Naval Service.

14. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination, and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being distinguished in such registers from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

15. The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister, at such times and in such manner as the Minister shall direct, all sums which shall be due from the licensee under such accounts.

16. All operators and other employees of the licensee at the said coast station shall be British subjects, and must be of such number and hold such Certificates of Proficiency as are specified in the schedule annexed hereto.

17. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and those of the International Radiotelegraph Convention of London, 1912, and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

18. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

19. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

20. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses,

powers and authorities and each and every of them shall absolutely cease, determine and become void.

21. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service. Ottawa.

SCHEDULE.

1. Name of coast station
2. Location
3. Latitude and longitude
4. Call signal
5. Normal range :—
Day
- Night
6. System of radiotelegraphy
7. Type of aerial
8. Characteristics of transmitter
9. Characteristics of receiver
10. Decrement per complete period
11. Wavelength (normal underlined)
12. Source of power
13. Maximum power taken by transmitter
14. If A.C., number of cycles
15. Hours of service
16. Coast charge :—
Per word
- Minimum per message
17. Operators to be borne on station :—
First class
- Second class
- Third class
18. Total charge (ship and coast to apply on outward messages only) :—
Per word
- Minimum per message
19. Stations with which the licensed station may communicate

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

W. 18.

F PUBLIC COMMERCIAL LICENSE.
19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a Radiotelegraph land station situated at

for the term of one year commencing on the first day of April

and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of Fifty Dollars (\$50), being the license fee for the privilege above-named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The expression "marine signalling" means signalling by means of any system of radiotelegraphy between two or more ships, between ships and any coast station, or between two Government coast stations; and the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. The licensee shall not establish, install or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada by any Department of His Majesty's Government, or with the marine signalling on the waters or territory of Canada, or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) With respect to any alternation of messages which the Minister may think necessary; and

(c) Generally with respect to avoiding interference between one radiotelegraph station and another.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day) as may be specified by the Minister.

8. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. (i) If the maximum power taken by the transmitter as mentioned in the schedule is less than 5 kw., then the coupling between the primary and secondary circuits of the transmitting oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits and the logarithmic decrement of the emitted waves per whole period, shall not exceed two-tenths.

(ii) In the case of stations using more than 5 kw. power the logarithmic decrement of the emitted waves per whole period shall be as specified by the Minister and as mentioned in the schedule.

10. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W.40, issued by the Department of the Naval Service.

12. (i) All messages transmitted by means of the licensed apparatus shall be copied in full in register to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for such period as is, from time to time, prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday, or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and the detailed regulations from time to time, made thereunder for carrying such provisions into effect; also such provisions of the International Radiotelegraph Convention of London, 1912, as are applicable to the operation of the station.

16. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

17. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this license, and shall be kept in operation during the hours specified in the schedule until this license shall expire.

18. All operators and other employees of the licensee at the said station shall be British subjects, and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

19. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

20. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

21. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the

Naval Service and may be served by sending the same by registered post letter to the office of the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station.....
2. Location.....
3. Call signal.....
4. Normal range:—
Day
- Night
5. System of radiotelegraphy.....
6. Type of aerial.....
7. Characteristic of transmitter.....
8. Characteristics of receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths
11. Source of power
12. Maximum taken by transmitter.....
13. If A.C., number of cycles.....
14. Hours of service.....
15. Charges:—
Per word.....
- Minimum per message.....
16. Operators to be borne on station.....
First class
- Second class
- Third class
17. Station with which the licensed station must communicate.....

Deputy Minister of the Naval Service,
Department of the Naval Service, Ottawa.
Dated this day of 19

W. 43.

PRIVATE COMMERCIAL LICENSE.

19 License No.
DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph land station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars (\$10), being the license fee for the privilege above-named.

This license is subject to the said Act and regulations, and to the following terms, conditions, and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction that is to say:—

The expression "marine signalling" means signalling by means of any system of radiotelegraphy between two or more ships, between ships and any coast station, or between two Government coast stations; and the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. The licensee shall not establish, install or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. The station shall be worked solely for the transmission and reception of messages appertaining to the service or affairs of the licensee and no tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any business or messages handled by the licensed apparatus.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada by any Department of His Majesty's Government, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) With respect to any alternation of messages which the Minister may think necessary; and

(c) Generally with respect to avoiding interference between one radiotelegraph station and another.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day) as may be specified by the Minister.

8. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. (i) If the maximum power taken by the transmitter as mentioned in the schedule is less than 5 kW., then the coupling between the primary and secondary circuits of the transmitting oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits and the logarithmic decrement of the emitted waves per whole period shall not exceed two-tenths.

(ii) In the case of stations using more than 5 kW. power the logarithmic decrement of the emitted waves per whole period shall be as specified by the Minister and as mentioned in the schedule.

10. (i) If and whenever any department of the Government shall require the licensee, his servants, or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants, and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

12. (i) All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is, from time to time, prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may from time to time, and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of the International Radiotelegraph Convention of London, 1912, as are applicable to the operation of the station.

16. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

17. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within _____ months from the date of this license, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

18. All operators and other employees of the licensee at the said station shall be British subjects and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

19. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers, and authorities, and each and every of them shall absolutely cease, determine and become void.

20. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

21. Any notice, request or consent (whether expressed in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station.....
2. Location
3. Call signal
4. Normal range :—
Day
- Night
5. System of radiotelegraphy
6. Type of aerial
7. Characteristics of transmitter.....

8. Characteristics of receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths.....
11. Source of power.....
12. Maximum taken by transmitter.....
13. If A.C., number of cycles.....
14. Hours of Service.....
15. Charges :—

Per word.....

Minimum per message.....

16. Operators to be borne on station :—

First class.....

Second class.....

Third class.....

17. Stations with which the licensed station must communicate

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this _____ day of _____ 19 _____

W. 20.

EXPERIMENTAL LICENSE.

19 _____ License No. _____

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPH."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

H The herein named _____ resident of _____ hereinafter called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at _____ for the term of one year commencing on the first day of April, 19 _____, and terminating on the thirty-first day of March, 19 _____, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5), being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions :—

i. In this license, the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i) The licensee shall not establish, install or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees :—

(a) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period of the emitted waves shall not exceed two tenths except when sending distress calls or messages relating to vessels in distress.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims, and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed, or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding certificates as are specified in the schedule annexed hereto.

11. The licensed apparatus shall be operated in accordance with the provisions of the Radiotelegraph Act and the regulations issued thereunder by the Governor in Council or the Minister, and also in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents, and the license or

permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

14. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time, to establish, extend, maintain and work any system or systems, of radiotelegraphic communication (whether of a like nature to that hereby licensed or other wise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station.....
2. Location.....
3. Call signal.....
4. Type of aerial.....
5. Natural wavelength of aerial.....
6. Transmitting wavelengths.....
7. Decrement per complete oscillation.....
8. Source of power.....
9. If A.C., number of cycles.....
10. Maximum power to be taken by transmitter.....
11. Hours during which station must not transmit.....
12. Characteristics of transmitter.....
13. Characteristics of receiver.....
14. The station must be worked by persons holding the following certificates—
When transmitting on.....metre wave.....
When transmitting on.....metre wave.....

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then, and in any such case, the Minister may, by writing, revoke

and determine these presents, and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal
4. Classification of station under Regulation No.
5. Type of aerial
6. Natural wavelength of aerial
7. Transmitting wavelength
8. Decrement per complete oscillation
9. Characteristics of transmitter
10. Characteristics of receiver
11. Source of power
12. Maximum to be taken by transmitter
13. If A. C., number of cycles
14. Hours during which the station must not transmit
15. Stations with which the licensed station may communicate

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of
19

LICENSE TO OPERATE A RADIO RECEIVING EQUIPMENT.

(ISSUED UNDER THE RADIOTELEGRAPH ACT,
STATUTES 1913, CHAPTER 43)

(Christian names in full) (Surname)

is hereby licensed to operate a radio receiving
equipment at

(Street and number)

(Province)

The license shall be in force from the day of
the date hereof, until 31st day of March next,
unless sooner forfeited.

Received the sum of one dollar (\$1.00) license
fee, this day of A.D. 192

A. Johnston,
Deputy Minister, Department of
Marine and Fisheries.
Countersigned

ORIGINAL
To be handed
to Licensee.

SECRECY OF MESSAGES.

1. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

This does not apply to broadcasted concerts or programmes addressed to the General Public.

Regulation 105. Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

NOTICE.

Irregular working and infractions of the radio regulations by transmitting stations should be immediately reported to the Director of Radio, Department Marine and Fisheries, Ottawa.

When using a receiver of the regenerative type for the reception of radiotelephone programmes, please avoid increasing regeneration to the point at which the receiver begins to oscillate, otherwise you will cause interference with neighbouring receiving equipments.

No. W. 44

License No.
Call Signal

Amateur
Experimental
License

19

W. 19.
SHIP LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

Class Ship Station.

The herein named
resident of herein-
after called the licensee, is hereby
licensed to establish and operate a radiotelegraph station on board the vessel
for the term of one year commencing on the first day of April, nineteen hundred and
terminating on the thirty-first day of March nineteen hundred and
and to instal and operate at such stations the apparatus mentioned in the schedule hereto on payment of the sum of one dollar (\$1), being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license the term "Minister" shall mean the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i) The licensee shall not establish, install or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The ship station shall be of such class mentioned in Regulations Nos. 34, 35 or 36 of the Minister's Regulations, as is specified in the said schedule annexed hereto.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed the maximum fixed by the International Radiotelegraph Convention of London, 1912.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station.

5. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

6. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

7. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths except when sending distress calls or messages relating to vessels in distress.

8. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. Subject to the provisions of this license, and in accordance with the regulations issued from time to time by the Minister, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship station without regard to the particular system of radiotelegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise, provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

10. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Canadian Government vessels), such messages shall have priority over all other messages (except messages

of distress), and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any messages coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus, and the licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

12. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Minister shall from time to time reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in

between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

13. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Deputy Minister of the Naval Service at the end of each month.

14. The licensee shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the ship station hereby licensed and coast stations or other ship stations, and shall pay to the Minister at such times and in such manner as the Minister shall direct all sums which shall be due from the licensee under such accounts.

15. The Minister or his duly authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed ship station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

16. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and International Radiotelegraph Convention of London, 1912, and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

17. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

18. (i) The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Minister, the British Postmaster-General or the corresponding authorities of any self-governing British colony or the Government of India, and the licensee shall provide for the working of the station such operators as are required by the provisions of Regulations Nos. 80, 81, 82 or 83 of the Minister's Regulations according to the classification of the station as is specified in the schedule annexed hereto.

(ii) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued in accordance with the Radiotelegraph Convention, 1912.

19. The licensees shall carry on the ship on which the ship station is established under this license a properly certified copy of such license, and shall produce such copy for inspection if required so to do by the duly authorised officials of the countries where the ship calls, and the following documents:—

Postmaster-General's Handbook for Wireless Telegraph Operators;
Official list of Radiotelegraph Stations;
Official list of Call Signals;
C.P.R., G.N.W. or Western Union Tariff Book;

Adequate supply of telegraph forms;
International Radiotelegraph Convention of London, 1912;

and also such other documents as may be prescribed by the Minister, for the purpose of enabling the licensee to communicate with coast and ship stations in accordance with the rules and regulations of the International Radiotelegraph Convention, 1912.

20. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

21. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these

presents, may be served by sending the same by registered letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

GENERAL.

1. Name of ship
2. Port of registry
3. Owner
4. Classification
5. Apparatus operated by
6. Call signal
7. Nature of service
8. Watches to be maintained
9. Operators to be borne on station—
First class
- Second class
- Third class
10. Ship charge—
Per word
- Minimum per message

MAIN APPARATUS.

11. Normal range
12. System of radiotelegraphy
13. Type of aerial
14. Transmitting wavelength (normal underlined)
15. Source of power
16. Maximum taken by transmitter
17. Decrement per complete oscillation
18. Characteristics of transmitter
19. Characteristics of receiver

EMERGENCY APPARATUS.

20. Normal range
21. Wavelength
22. Source of power and capacity of same
23. Type of transmitter

Deputy Minister of the Naval Service,
Department of the Naval Service, Ottawa.

Dated this day of 19

W. 66.

Training School License. License No.
19 Call Signal

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

K The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph Training School situated at for the term of one year commencing on the first day of April, 19 , and terminating on the thirty-first day of March, 19 , and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of One Dollar (\$1), being the license fee for the privilege above-named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i.) The licensee shall not establish, install or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The licensee shall work the licensed apparatus solely for the purpose of instruction in radiotelegraphy and for no other purpose whatever.

3. (i.) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii.) With a view to preventing such interferences as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii.) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

5. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

6. The Minister or his officers, may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

7. The licensed apparatus shall not, without the consent of the Minister be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

8. The licensed apparatus shall be operated in accordance with the provisions of the Radiotelegraph Act and the Regulations issued thereunder by the Governor in Council or the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

9. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. No person shall operate or work the receiving apparatus at the licensed school who has not subscribed to, and filed with, the Minister of the Naval Department, a Declaration of Secrecy as prescribed in Section 6 of the Radiotelegraph Act and Radiotelegraph Regulation No. 72.

The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

10. At least one of the instructors at the licensed school shall be the holder of a First-class Canadian Certificate of Proficiency in Radiotelegraphy. Other instructors, teaching in one or two subjects only, must have passed a successful examination in the subject or subjects, with which they propose to deal; the papers for this examination and the percentage of marks to be obtained will be as prescribed for the examination for a First-class Canadian Certificate of Proficiency in Radiotelegraphy.

11. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents and the said licenses, powers and authorities and each and every one of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever, upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under

these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal
4. Type of aerial
5. Natural wavelength of aerial
6. Transmitting wavelength
7. Decrement per complete oscillation
8. Characteristics of transmitter
9. Characteristics of receiver
10. Source of power
11. Maximum to be taken by transmitter ..
12. If A. C., number of cycles
13. Hours during which the station must not transmit
14. Stations with which the licensed station may communicate

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

DEPARTMENT OF MARINE AND FISHERIES.

L DOMINION OF CANADA.

"LICENSE TO USE RADIO."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
Resident of

hereinafter called the Licensee, is hereby licensed to establish and operate an amateur experimental radio station situated at
for the term of one year commencing on the first day of April and terminating on the thirty-first day of March and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar (\$1.00) being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

4. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

5. (a) The licensee shall, if so required by the Minister, cease to use the licensed transmitting apparatus for such period or periods in each day as may be specified by the Minister.

(b) The licensed transmitting apparatus shall not be used during the periods when official time signals are being broadcasted.

6. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the license.

7. When the licensed station is in the vicinity of a Government or Commercial radio station it must be provided with a connection with the local wire telephone system.

8. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

9. The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelengths.

10. Broadcasting of any description by the licensed station is not allowed.

11. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

12. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

13. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

14. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy as provided for in Regulation No. 97 of the Minister's Regulations.

15. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such stations, for the purpose of sending and receiving message,

by radio or all other telegraphic instruments and apparatus fixed and being in such stations, and the working and user of such apparatus and telegraphic instruments.

16. (i) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(ii) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

17. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

18. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

19. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
2. Location
3. Call Signal.....
4. Type of Aerial
5. Transmitting wavelength (1) Spark.....
(2) C.W. or Telephone
6. Decrement per complete oscillation.....
7. Characteristics of transmitter
8. Characteristics of receiver
9. Source of power.....
10. Maximum to be taken by transmitter.....
11. If A.C., number of cycles.....
12. Hours during which the station must not transmit.....

Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries, Ottawa,
Dated this.....day of.....19..

W. 70

License No.....
Call Signal.....

Amateur
Broadcasting
License

DEPARTMENT OF MARINE AND FISHERIES.

19....

DOMINION OF CANADA

Date....19..

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENSE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named..... resident of..... hereinafter called the licensee, is hereby licensed to establish and operate a radio land station at.....

for the term of one year commencing on the first day of April, .. and terminating on the thirty-first day of March, .. and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00), being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radio-telegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other radio station in Canada, or with Marine signalling on the waters or territory of Canada, or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signal transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) With respect to any alternation of programmes which the Minister may think necessary and

(c) Generally with respect to avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40 issued by the Department of Marine and Fisheries.

11. A proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

12. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

13. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

14. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

15. The licensee shall instal the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this license and shall be kept in operation during the hours specified in the schedule until this license shall expire.

16. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

17. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case the Minister may, by writing, revoke and determine these

presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

18. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise, in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licenses relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

19. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

20. The licensee may, subject to the approval of the Minister, authorise the use of a station belonging to one of its members to broadcast on its behalf. Such station whilst broadcasting becomes the licensed station authorised hereunder and the licensee will be responsible for its proper operation in accordance with the provisions of this license.

21. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Marine and Fisheries, and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Normal Range Day.....
Night.....
5. System of Radio.....
6. Type of Aerial.....
7. Characteristics of Transmitter.....
8. Characteristics of Receiver.....

9. Decrement per complete oscillation.....
10. Wavelengths (Normal underlined).....
11. Source of power.....
12. Rating of motor generator.....
13. Maximum power to be taken by transmitter, and voltage.....
14. Hours of service.....
15. Operators to be borne on station:—
 - 1st Class.....
 - 2nd Class.....
 - 3rd Class.....

Deputy Minister of Marine and Fisheries

Department of Marine and Fisheries, Ottawa,

Dated this.....day of.....19..

W. 20

Experimental
License

License No.....

Call Signal.....

19....

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

"LICENSE TO USE RADIO."

Issued in accordance with the provisions of the Radiotelegraph Act Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named.....

resident of.....

hereinafter called the licensee, is hereby licensed to establish and operate an experimental radio station situated at..... for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00) being the license fee for the privilege above named.

This licensee is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radio, and for no other purpose whatever.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. The licensed station must be provided with an accurate wavemeter of approved type.

9. The licensed station must be provided with a connection with the local wire telephone system.

10. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

11. The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

12. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

13. When using a wavelength greater than 275 metres a process verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all process verbaux for such period as is from time to time prescribed by the Minister and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

14. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensed apparatus shall only be worked by a person or persons holding such certificates as are specified in the schedule annexed hereto.

17. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments.

18. (1) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(2) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

19. Nothing in these presents contained shall prejudice or effect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licenses relative to the working or user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the..... office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Normal range, Day.....
Night.....
5. System of Radio.....
6. Type of Aerial.....
7. Characteristics of Transmitter.....

8. Characteristics of Receiver.....

9. Decrement per complete oscillation.....

10. Wavelengths (Normal underlined).....

11. Source of power.....

12. Rating of motor generator.....

13. Maximum power to be taken by transmitter and voltage.....

14. Hours during which station may transmit.....

15. The station must be worked by persons holding the following certificates:—

When transmitting on... metre wave..

When transmitting on... metre wave..

16. Stations with which the licensed station may communicate.....

Deputy Minister of Marine and Fisheries

Department of Marine and Fisheries, Ottawa.

Dated this... day of..... 19....

W. 69

Private Commercial
Broadcasting License

License No.....

Call Signal.....

19....

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENSE TO USE RADIO.

O Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statute 1913, and the Regulations made thereunder.

The herein named..... Resident of..... hereinafter called the licensee, is hereby licensed to establish and operate a Radio land station situated at..... for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of Fifty dollars (\$50), being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being the term "radio" means and includes "radio-telegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. No tolls, fees, or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station,

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other Radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other Radio station.

(b) With respect to any alternation of programmes which the Minister may think necessary, and

(c) Generally with respect to avoiding interference between one Radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. (i) If and whenever any department of the Government shall require the licensee, his servants or agents to transmit by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other transmissions and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof suspend all other transmission.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

12. A procès verbal of all signals transmitted giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all procès verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

13. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within.....months from the date of this license, and shall be kept in operation during the hours specified in the schedule until this license shall expire.

17. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

18. In case of any breach non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then in any such case the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

19. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licenses relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Normal Range, Day.....
Night.....
5. System of Radio.....
6. Type of Aerial.....

7. Characteristics of Transmitter.....
8. Characteristics of Receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths (normal underlined).....
11. Source of power.....
12. Rating of motor generator.....
13. Maximum power to be taken by transmitter, and voltage.....
14. Hours of Service.....
15. Operators to be borne on station :—
1st Class.....
2nd Class.....
3rd Class.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19.....

CAPE VERDE ISLANDS

(See under PORTUGAL.)

CEYLON

(See also Map Section)

Including : Maldie Islands.

THIS British Colony, lying S.E. of Hindustan in the Indian Ocean (latitude $5^{\circ} 53' 5''$ to $9^{\circ} 50' N.$; longitude $79^{\circ} 48'$ to $81^{\circ} 52' E.$), possesses a written history dating from 543 B.C., and the Portuguese were the first of European nations to fix a permanent settlement in the Island; this occurred in A.D. 1517. The Portuguese gave place to the Dutch in 1658, and the latter surrendered Ceylon to the British in 1796, possession being confirmed by treaty in 1802. The Island is administered by a Governor aided by an Executive Council. It has an area of 25,481 square miles and a population of 4,504,283.

CONTROL.

The Wireless Station is under the control of the Postmaster-General and Director of Telegraphs. The actual working is vested in the undermentioned officials :—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. E. Harper, A.M.I.E.E., Mem. Inst. Radio Engrs.	Superintending Engineer	Colombo.
Mr. A. G. Tillekeratne ..	Superintendent of Traffic	Colombo.
Lieut. M. J. Golightly ..	Officer in Charge of the Wireless Station ..	Colombo.

The rest of the operating staff are members of the Postal Department. The station belongs to the Government. There are no Experimental Amateur or Ships' Stations licensed in Ceylon, and no Wireless Clubs or Societies exist in the Island. The granting of licenses to amateurs is under consideration.

ORGANISATION.

The erection of the first Wireless Station for Ceylon was sanctioned by the Ceylon Government in 1910. Finally a site in Colombo was adopted as the best available from an "all-round" standpoint for a single station. The contract for the station was given to the Marconi Wireless Telegraph Co. in 1911 and the station was brought into use in 1912. A station has been erected at Matara, and is under the control of the Admiralty. This station is not available for public correspondence. Arrangements for the transmission of Time Signals have not yet been completed, but it is hoped to include

particulars in a subsequent edition. Local weather reports are available for ships on request and charged for in accordance with Article 45 of the International Radiotelegraph Convention of London, 1912. Weather reports for India from ships are accepted free.

A Flying Services Association has been formed in Ceylon with a view to assisting Government and Commercial Aviation generally. The machines will be fitted with wireless apparatus, and small installations will be erected at the Aerodrome, the sizes of which have not yet been finally decided upon. There are at present no direction finding stations. The experiments are being carried out at the Columbia station.

ADMINISTRATION.

Wireless Telegraphy in Ceylon and its territorial waters was originally legislated for under an Ordinance of 1903. In 1908 an Ordinance (No. 35) regulating Telegraphy in general was passed, which was afterwards extended to affect Wireless Telegraphy by an Amending Ordinance (No. 15), passed in 1914. This later Ordinance, however, specifically cancelled a provision, contained in that of 1908, which provided for the continuance in force of the original 1903 enactment. The latter has, therefore, now been completely abrogated, and Wireless Telegraphy in Ceylon is regulated (a) by such clauses of the 1908 Ordinance as are applicable to Wireless Telegraphy; (b) by the Amending Ordinance (No. 15) of 1914; and (c) by the rules formulated under the provision of the latter Ordinance.

New regulations for the control of Wireless Telegraphy have been drafted and are under consideration. We have been unable to obtain information relating to them before going to press.

A—Ordinance No. 15 of 1914 (August 18th).

B—Rules under this Ordinance.

ORDINANCE.

A Ordinance No. 15 of 1914 (modifying Ordinance No. 35 of 1908) and dated August 3rd, 1914, provides in its Clause 5 an amendment of Section 7 of the 1908 Ordinance. This prescribes the right of the Governor in Executive Council to "make rules, consistent with the Ordinance, for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this Ordinance." Rules under this section may provide for all or any of the following, amongst other matters, that is to say:—

(a) The rates at which, and the other conditions and restrictions subject to which messages shall be transmitted.

(b) The precautions to be taken for preventing the improper interception or disclosure of messages.

(c) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved; and

(d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer.

(e) For prescribing the form and the manner in which applications for licenses under this Ordinance are to be made.

(f) For prescribing fees payable on the grant of any license.

(g) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, shall be worked so as to prevent interference with naval signalling, or the working of any

wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea.

(h) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon.

(i) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may deem fit to make from time to time, either in all cases, or in such cases as may be deemed desirable.

Moreover, Clause 6 of Ordinance No. 15 of 1914 adds to Clause 7 of the 1908 Ordinance a new sub-section lettered (2) A, which runs as follows:—

Provided that no regulations made in respect of the matters described in paragraphs (g), (h), and (i) or sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

RULES.

B The current rules, under which the wireless telegraphy is at present administered, were issued on December 3rd, 1914. They were based on Ordinance 15 of 1914 (see above) and run as follows :—

DECEMBER 3RD, 1914.

1. Any person desirous of obtaining a license for the establishment of a wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony, or on board any British ship registered in the Colony, must apply in writing to the Colonial Secretary. Such application must contain full particulars—

(a) Of the place or ship in respect of which a license is sought ;

(b) Of the nature of the apparatus which it is desired and proposed to install and work; and

(c) Of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licenses :

(a) For a license for a land station Rs. 5

(b) For a license for a ship station 5

(c) For an experimental license Free

3. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony, shall be worked in such a way as not to interfere with :

(a) Naval signalling ; or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or in waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more

ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station, whether on shore or on any ship.

5. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port, or bay of the Colony, except with the special or general permission of the Postmaster-General.

6. (i) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board merchant ships, whether British or foreign, whilst in the waters of the Colony, shall be subject to such rules as may be made by the Governor, and such rules may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

(ii) Such notice as aforesaid shall be published in the *Ceylon Government Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

CHILE

(See also Map Section)

THE narrow strip of territory constituting the Republic of Chile lies between that remarkable range of mountains known as the Andes and the Pacific Ocean. The country is divided into 23 provinces, with an area of 289,829 square miles, and a total estimated population of about 3,754,723.

CONTROL.

Wireless Telegraphy in Chile is a State monopoly under the management of the Naval Department.

All Chilian wireless stations, both ship and land, are controlled by the Admiralty, and the Wireless Section of the Navy forms part of the general organisation administering naval affairs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Vice-Admiral Don Miguel Aguirre	Chief of the General Maritime Office	Direccion del Territorio Maritimo
Lieut. - Com. Don A. Brito	Head of the Wireless Section	Valparaiso
1st Lieut. P. Gallardo	Assistant	Do. Do. Do.

ORGANISATION.

The first practical demonstration of wireless telegraphic communication was given in 1904, when the Marconi Company conducted a series of successful experiments between the Chilean Navy Cruisers "Esmeralda" and "Errazuriz," the apparatus utilised being coil and coherer sets.

At the present time the number of stations in operation total 78; these include 18 land stations varying in power from $\frac{1}{10}$ kW. to 100kW. The stations fall under the following classification:—

Ship Stations	—	Naval	..	30
"	"	Mercantile	..	28
Land Stations	—	Open to public service	..	12
"	"	Control	..	1
"	"	Experimental	..	3
"	"	For aviation services	..	1
"	"	Amateur	..	1
Air	"	Aero-hydroplane	..	2

ADMINISTRATION.

Below will be found the Law and Regulations governing the use of wireless in Chile.

A—Law governing wireless service in Chile.

B—Regulations for the Wireless Service.

(Licenses and Categories, Wireless Sets, Staff, Service and Documentation, Inspections, Belligerency and Neutrality of the Wireless Stations, License for Ship Wireless Station, Wavelength, License for Ship Wireless Operator.)

C—Regulations for Radio Communication.

(General Dispositions, Acceptance, Taxation and Payment of Radiotelegrams, Transmission and Reception of Radiotelegrams, School for Mercantile Radiotelegraph Operators, Admission of Students, Examination of Students, Examination for Second and First-class Operators, Repetition Courses and Requalifying for Titles, Syllabus of Oral and Written Examinations.)

D—Regulations for Private, Amateur, and Practical Radiotelegraph Stations.

PROJECT OF LAW GOVERNING THE
WIRELESS SERVICE IN THE
CHILEAN REPUBLIC.

SECTION I.

A ART. 1.—Wireless stations destined to transmit and receive wireless signals to or from other wireless stations in Chile or in any other foreign country, can only be installed and worked by the State.

Nevertheless, the State may permit the installation and working of private wireless stations destined exclusively to experimental work or for purposes of instruction, but under the condition that the power of such stations shall not exceed $1/12$ h.p. All wireless stations installed for experimental or educational purposes shall be submitted to the inspection and control established in the respective regulation.

ART. 2.—All persons that install or attempt to install clandestine wireless stations of any kind shall be liable to punishment according to the regulations of the service and the laws of the country.

The State will confiscate all the material employed in these clandestine stations.

ART. 3.—(a) The State will dispose the installation of all the wireless stations in the country electing the sites according to plans consulting all military, naval and commercial necessities of the country.

(b) In those isolated regions of the country where private persons solicit wireless communication and there exists manifest convenience in the establishment of such communications, wireless stations may be installed, but under the condition that the land required shall be ceded to the State by those interested also the total cost or that part of the cost decided upon by the Government, shall be borne by the persons or parties interested in the said communication.

At the termination of the construction of such stations the same shall pass over wholly to the State together with the land occupied.

ART. 4.—The wireless installations shall be as uniform as possible, and of a national type that shall satisfy the wireless service of the country and the different parts shall, as far as possible, be made in the country.

ART. 5.—All the wireless stations destined to transmit or receive wireless communications of any kind shall be under the charge of the Ministry of Marine, and the stations shall be worked by personnel of the Navy with exception of the Army wireless stations which will be under the charge of the Ministry of War.

ART. 6.—The Minister of Marine will designate the wireless stations that may attend public service of wireless communication.

These stations shall be directly connected to the State land telegraphs, which will serve to connect the wireless stations with the general public.

The tariffs shall be collected under the charge of the Minister for Home Affairs, and the said Ministry shall maintain all relations and communications that the wireless service may cause with other foreign administrations, wireless telegraph companies, telegraph or cable companies.

ART. 7.—(a) Six months after this law is passed no ship will be allowed to enter or leave any of the ports of the Chilean Republic that carries 50 or more persons on board (including the crew), unless the ship is installed with wireless telegraph apparatus.

The wireless apparatus must be in working order and be capable of transmitting and receiving messages at a distance not less than 200 miles during the daytime.

(b) In certain accidental cases expressly determined by the respective regulations, ships may be allowed to enter or leave Chilean ports, although they may be carrying 50 or more persons on board, and are not installed with wireless telegraph apparatus.

(c) The respective regulation will fix the number of operators, capable of working the wireless installation that all merchant ships must carry according to their class, which class will be determined by the same regulation.

(d) Any infraction or attempt at infraction of this article will be fined the sum of from one to five thousand Chilean gold dollars.

ART. 8.—(a) The wireless apparatus installed on board Chilean merchant ships will be subjected to the conditions that the respective regulations may fix.

(b) All wireless operators on board Chilean merchant ships must be of Chilean nationality.

(c) The Government will establish annexed to the Naval wireless school, the necessary courses of instruction to form operators destined to serve in the National Merchant Marine.

The cost of these courses will be paid for by the companies or persons concerned, in the form to be indicated by the respective regulation.

ART. 9.—In the annual budget funds will be consulted to maintain and increase the State Wireless Telegraph Service.

SECTION II. GENERAL REGULATIONS OF THE WIRELESS SERVICE.

CHAPTER I.

LICENSES AND CATEGORIES.

B ART. 1.—Every sailing or mechanically propelled vessel having 50 persons or more on board, including the crew, and not being permanently anchored, must possess an efficient wireless set capable of communicating up to 200 miles during the day.

ART. 2.—(a) Before carrying out any installation whatever, the company or shipowners should apply in writing to the Maritime Territory Section of the Navy, for a numbered copy of the special formulary of licenses, in order to fill in the particulars of the wireless set, and return it duly completed to the said authorities.

(b) Subject to the corresponding report by the wireless inspector, this document shall be submitted through the usual channel to the supreme Government for its approval.

(c) Only from the time the license is approved by the Government will the shipowners be allowed to use the wireless set.

(d) The licenses to be made out for a period not exceeding five years.

ART. 3.—It is prohibited to use a wireless set without a license, or with one whose time has expired, unless the companies, shipowners or proprietors, have made an application for its renewal, and this is granted in accordance with Art. 2.

ART. 4.—Such shipowners, companies or proprietors of wireless sets, who should be in need of a duplicate of the license in order to replace the original one lost or destroyed, must lay before the Maritime Territory Section evidence of the circumstances which caused such loss or destruction. That duplicate will be given by this authority, with the same original number and with the word "duplicate" written in red letters, and diagonally across the first page.

ART. 5.—The following vessels are excepted from the obligation set up in Art. 1:—

(a) Those national ships registered with less than 100 tons, which do a coasting trade exclusively within inhabited canals or sheltered and safe bays.

(b) Those national ships of small cargo which carry ordinarily less than 50 persons on board, are incidentally used for pleasure excursions or others of a sporting character, and consequently carry a greater number of persons. These excursions should not be in excess of four in 30 consecutive days, nor be made outside a radius of 30 nautical miles from the starting point, nor last longer than 24 hours each time.

ART. 6.—Such vessels as are included in Clauses (a) and (b) of the previous article, shall apply in writing to the Maritime Territory Section of the Navy for the corresponding license, enclosing a maritime authority certificate of the registered port, attesting the right of exception.

The Maritime Territory Section shall make out the license for periods to be renewed on the 1st January of each year, on the application of the person concerned.

ART. 7.—The wireless station to be classified in three categories, namely:—

(a) First category.—To this category belongs those ships that have a permanent service, and that carry more than 50 persons on board and that develop an average speed of 12 miles an hour, and under these conditions run a single trip not exceeding 500 miles.

(b) Second category.—To this category belongs those ships that have a service of limited duration, and that carrying more than 50 persons on board, develop an average speed of less than 12 miles, and under these conditions do not run more than 500 miles per single trip.

(c) Third category.—To this category belongs those ships that have no regular service, and that are not included in the first and second categories.

(d) The categories will be assigned in the licenses for installing wireless sets.

CHAPTER II.

CONCERNING THE WIRELESS SETS.

ART. 8.—The type or system of the wireless set is left to the option of the company, shipowners or proprietors, an express condition being that the circuits composing it should be "synchronised," *i.e.*, have the same period of vibration.

ART. 9.—(a) The power of the wireless set will be sufficient to obtain a distance of 200 nautical miles during the day, and is at all times to be in a state for use.

(b) While wireless communications are being made the minimum power consistent with the distance will be employed.

(c) The companies, shipowners or proprietors will, however, be able to dispose of a higher power than the one set up in Clause (a) of this article; subject to an application being made for it when filling in the particulars of the license.

(d) The wireless set will be tried at full power once a week to verify its efficiency.

ART. 10.—(a) The normal wavelength is 600 metres and every station must be able to use this wavelength as well as that of 300 metres.

(b) Wireless communications between vessels and with land wireless stations will always be made with 600 metres wavelength; but such characteristic may be, by mutual agreement, altered in cases of difficulty in the transmission, the normal wavelength to be resumed at the end of the transmission of the message.

(c) The waves emitted shall be very pure and as deadened as possible.

ART. 11.—It is prohibited to use the simple vertical radiator, except in cases of signals for help; the aerial of this type, implying that which allows for the direct transmission of waves by means of sparks.

ART. 12.—The wireless set must be capable of transmitting and receiving messages at a speed of no less than 20 words per minute, calculated at the rate of five words per minute.

ART. 13.—(a) Every wireless station shall be provided with a quantity of spare-parts and tools necessary for repairs and to rapidly replace those elements which may deteriorate by accidents.

(b) A pair of complete telephone receivers to be always kept in reserve.

(c) Similarly, a voltmeter, a hydrometer, electrolite, and distilled water, for the working and preservation of the battery will also be available.

ART. 14.—(a) Between the wireless station and the bridge will be established an efficient communication, for which object a telephone, or speaking-tube, may answer the purpose. Such communication will commence and end at either of the above-mentioned points, or in the chart room, if this is near the bridge.

(b) Should the wireless station be accessible from the bridge the orders may be given by word of mouth, without having a special communication installed.

(c) Verbal transmission of messages by means of a third person is prohibited.

ART. 15.—Any alteration in the apparatus involving a change in the characteristics of the wireless set is subject to the authorisation of the Maritime Territory Direction.

ART. 16.—(a) Where the ship to which the wireless set belongs goes under repairs for more than three months, the license will be forwarded to the Maritime Territory Direction with a view to writing on it the corresponding annotations.

(b) In case of definitive dismantlement of the ship, or of it being placed on a different service not requiring it to possess a wireless set, the license will likewise be sent for its cancellation to the Maritime Territory Direction.

ART. 17.—(a) Every ship will have an emergency power independent of the principal electric plant, capable of transmitting wireless messages for four consecutive hours at least, and sufficiently protected against accidents.

(b) The transmitting apparatus will be continuously in a state of working by means of the emergency power at only two minutes' notice.

(c) Before sailing, and daily while at sea, the wireless set will be tried utilising the emergency power, and its results will be noted in the wireless log.

(d) Occasionally, from the land stations, the ships at sea will be called upon to send messages with the emergency power, in order to ascertain their efficient condition.

CHAPTER III.

STAFF, SERVICE AND DOCUMENTATION.

ART. 18.—(a) For the working of wireless sets on board the Chilean mercantile ships, the operator is required to be in possession of the title of wireless telegraphist, conferred by the Maritime Territory Direction of the Navy.

(b) Only Chilean subjects, or naturalised foreigners, in accordance with the Republican Laws, will be able to obtain those titles.

(c) Candidates for the position as wireless operators must pass the examinations set up in Section IV of the present General Rules, and comply with the requirements therein laid down.

(d) Every wireless operator is bound by oath to maintain strict secrecy in the correspondence, whatever the nature of this may be.

ART. 19.—The titles are of two classes: First and Second:—

(a) First Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations in Section IV, can send and receive wireless messages at a speed of not less than 20 words a minute (Chapter II, Art. 12).

(b) Second Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations quoted in the previous clause, can send and receive wireless messages at a speed of between 12 and 19 words a minute.

ART. 20.—The appointment of wireless operators in the mercantile vessels will be as expressed below:—

(a) First category wireless station.—This will have at least two first class wireless operators.

(b) Second category wireless station.—This will have at least one first class operator and one second class.

(c) Third category wireless station.—This will have at least one first class operator and one second class.

ART. 21.—The service of watchmen will be run in accordance with the category to which the wireless stations belong (Art. 7, Chapter I), as follows:—

(1) First category wireless stations.

(a) The watch will be kept permanently, that is to say, the wireless operator will continuously have the receivers on, or off, but within the premises of the wireless station, when this be fitted with special instruments of communication, such as bells, etc.

(b) The wireless operator will communicate every half-an-hour to the official on duty on the bridge any changes, to show that he has not abandoned his post.

(c) He will make notes on the station log every quarter-of-an-hour, making sure that such notes consist of characteristics of other stations and of other words intercepted.

(2) Second category wireless stations.—The watch will consist of at least 10 hours daily and of 10 minutes at the beginning of each remaining hour; the same obligations as those laid down in the previous clause applying to the operators of these stations while they are on duty.

(3) Third category wireless stations.—The watch will be eventual, as when entering or leaving the port, in places of much maritime traffic, etc., leaving the organisation of the service to the arbitration of the ship's captain.

ART. 22.—(a) Should an operator fail to comply with the present regulations, the information to that effect being given either by the ship's captain or through the controlling wireless stations, the Maritime Territory Direction of the Navy will have the option of suspending the culprit for a given time, of definitely cancelling his title, according to the gravity of the omission.

(b) Where such omissions are not the fault of the operator himself, but through reasons over which he has no control, or through express orders of the companies, shipowners or proprietors, the Maritime Territory Direction of the Navy, will make the necessary inquiries and the consequent fine will be made against him.

ART. 23.—The wireless service on board a merchant ship is subject to the supreme authority of its captain who will see that the wireless station is in good order of preservation, efficiency and cleanliness, and that the conditions of the present rules are strictly complied with.

ART. 24.—When ships are in port, the wireless station will be kept closed, the key to remain, in every case, on board in case the Maritime Authority should desire to make an inspection.

ART. 25.—Every station shall have the following documents:—

- (1) The wireless station license.
- (2) A copy of the present Rules.
- (3) A copy of the "Berne Official List *re* Wireless Stations," together with its latest supplements.
- (4) Range formulæ, in the number required.
- (5) Pages of range formulæ.
- (6) A copy of standing tariffs.
- (7) A blackboard placed outside the wireless station wherein will be noted consecutively the wireless stations coming into the range of distance.
- (8) A log of the wireless station.

CHAPTER IV. INSPECTIONS.

ART. 26.—In pursuance of Art. 44 of the Navigation Law, the stations of all coast mercantile ships, both national and foreign, will be inspected every six months. To this effect the Maritime Authority will delegate its functions on those inspectors mentioned in the subsequent article, who will form part of the Inspection Committee.

ART. 27.—The Maritime littoral will be composed of a general inspection, stationed in Valparaiso, and four district inspections as follows:—

(a) Punta Arenas, covering the whole zone of the Estrecho and canals of Patagonia and Tierra del Fuego.

(b) Port Montt, covering all Chiloe and Moraleda canals, as far as the Penas Gulf, including Ancud Bay.

(c) Talcahuano, covering from Ancud as far as Talcahuano.

(d) Antofagasta, covering from Caldera up to the north.

In charge of the General Inspection will be the "Inspector of Wireless Telegraphy of the National Mercantile Marine." Such inspector will have under his jurisdiction the whole littoral of the Republic.

The district inspectors will be officials in the Navy, competent in wireless telegraphy, either in service or retired. These inspectors will be under their respective Maritime Authority, and are only inspecting the ships of their list, not out of the zones allotted to them.

In Valparaiso the wireless telegraphy inspector will inspect all the other ships.

ART. 28.—The district inspectors will, in all that concerns the obligations under their charge, be under the wireless telegraphy inspector, to whom they must send a report monthly of the ships inspected, giving particulars worth mentioning and suggestions as to the steps which should be taken.

ART. 29.—The Maritime Authorities will be able, when any infraction of the regulations or failure in the installation comes to their knowledge, to decree a special inspection, either by the corresponding inspectors, or in those ports without one, by an official on active service or retired, competent in wireless telegraphy, appointed for the purpose.

ART. 30.—In the half-yearly inspection mentioned in Art. 26, the inspector must pay special attention to the instruments of the station being in good condition, and to the efficiency being what is required of them, and also—

(a) To receive those complaints on the service of communications made by the company, captains, or passengers.

(b) To verify that the wireless set be synchronised to the waves of 300 and 600 metres.

(c) To ask for the presentation of the following documents:—

License of the wireless station; to verify that the telegraphists are the number required, and that they are in possession of their titles; to go through the communications records, and investigate any complaints received regarding infractions of the International Regulations, or others.

All of which must be recorded in the Navigation Certificate, without which requisite this will be valueless.

ART. 30A.—With regard to foreign ships, not included in Art. 26, the Maritime Authority of the first port at which the ship calls, will, in accordance with the International Convention dispose that the person indicated in Art. 29, shall effect an inspection, making sure that the ship carries the license from its respective Government in which the working of the wireless station is authorised, and that the operators possess the necessary titles.

Should not these documents be shown to them, the inspectors will be able to verify as to whether the installations comply with the conditions stipulated in the said Convention, and if the personnel is competent.

If such a visit could not be effected, through the want of an inspector, the Maritime Authorities of the other ports at which the ship calls will be advised of it.

ART. 30B.—Excluding the inspections indicated in Art. 26, the companies, shipowners, captains or proprietors, who require it, may apply in writing to the Maritime Authorities, for the inspection of the wireless stations on their ships, or for new installations being effected in them.

The corresponding authority will comply with the request in accordance with the circumstances and will at once communicate with the Maritime Territory Direction.

ART. 30C.—The tariff for the wireless telegraphy and telephony inspectors will be exclusively born by the vessel, and are as follows:—

Class of Work.	Wireless telegraphic and telephonic station up to 2 kW. power.	Wireless telegraphic and telephonic station above 2 kW. power.
	Dols.	Dols.
(A) Half-yearly inspection	20-00	30-00
(a) Study of plans and specifications of wireless stations to be installed.	150-00	200-00
(b) Inspection of a wireless station installation . . .	250-00	350-00
(c) Installation of a wireless station	1000-00	2000-00
(d) Study of plans and specifications for repairs or alterations in a wireless station.	100-00	150-00
(e) Inspection of repairs or alterations in a wireless station.	200-00	300-00
(f) General inspection of a station in service, either compulsory or by application.	75-00	100-00
(g) Partial inspection of a station in service, either compulsory or by application.	50-00	75-00

Kind of Infraction.	Amount of the penalty or fine.
(a) Vessels not having any wireless set installed, as stipulated in the Regulations.	Sailing cancelled and fine of from \$1,000 to \$5,000 gold of 18 ct.
(b) Vessels with wireless sets installed on them, but without the necessary license, through not having applied for it, and for not having renewed that which has expired, or for not having asked for a duplicate of the one destroyed, thus testifying its destruction.	Sailing cancelled, fined with \$500, the requisites to be complied with on payment of the fine.
(c) That vessel which is excepted from having a wireless set installed, but has not applied for its corresponding license of exception.	\$150, the document to be applied for on payment of the fine.
(d) That vessel which being equipped with a wireless set lacks the necessary spare parts and tools (Art. 13).	\$50 each time the infraction is discovered.
(e) That vessel which being equipped with a wireless set, has no efficient communication between the bridge and the station.	\$25 each time the infraction is discovered.
(f) Any vessel making alterations in its wireless set without previously applying for an authorisation from the Maritime Authority.	\$150 each time the infraction is discovered.
(g) Any vessel which, being equipped with a wireless set, does not possess emergency power (Art. 17).	\$200, to proceed with such installation immediately upon payment of the fine.
(h) Any vessel which, being equipped with a wireless set, does not have the statutory number of operators, and these fail to comply with the provisions of Chapter III.	Cancellation of sailing for first offence, and \$25 for each operator's infraction.
(i) Misemployment of the signal for help.	\$5,000.
(j) False communications, talking, discussions, superfluous signals or interruptions (Art. 15, Clause (a). Section III).	\$100.
(k) Any ship which, being anchored in port, uses its installation for directly communicating with other ships.	\$500.
(l) Every infraction of the regulations not made by the operator himself but by other causes over which he has no control, or by express orders of the company, shipowners or proprietors (Art. 22, Clause (b), Section II).	\$300 up to \$1,000

The power of the stations to be taken at the terminals of the generator.

ART. 31.—Infractions of the regulations incurred by shipowners, companies or operators will be punished with fines for the benefit of the Naval Hospital, as under:—

CHAPTER V.

BELLIGERENCY AND NEUTRALITY OF THE WIRELESS STATIONS.

ART. 32.—When the Republic of Chili is in a state of war, all wireless stations belonging to its mercantile ships will be requisitioned by the National Navy.

ART. 33.—When the Republic of Chili declares itself neutral in armed conflicts among other nations, those national and foreign vessels which patronise her shores will be subject to complying with the articles as laid down below.

ART. 34.—(a) No national wireless station will be allowed to maintain any relationship with either the foreign representatives or those of the Republic, nor demand or supply any information at all, other than through the medium of the Foreign Office.

(b) In some exceptional cases such relations may be directly cultivated, but to do so both the express consent of the Foreign Office and the assent of the Ministry of the Navy and General Army Direction will be required.

(c) All wireless telegraphy or telephony communications regarding the position of the merchant and war ships of the belligerent states, or any message capable of disclosing same, or mentioning their names, is strictly prohibited.

(d) Likewise is strictly prohibited the misuse of signals for help for the purpose of favouring a certain belligerent.

(e) Shipowners and merchant vessel commanders shall give all kinds of facilities to the inspectors and other persons appointed by the State, whether in war-time neutrality or belligerency, in order to control the telegraphic stations as dictated to them by the Government.

(f) The Government will be able, through the Ministry for the Navy, to give orders in such cases as in war time, neutrality or belligerency for the transmission of telegrams in ordinary language.

ART. 35.—Where belligerent states develop their hostilities in waters near the national shores, the following dispositions shall be strictly adhered to:—

(a) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, no matter of what nationality, navigating either within the Chilean littoral or lying anchored in Chilean ports, shall not in any way be able to use those apparatus.

(b) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, without regard to nationality, calling at any port or cover of the Republic, shall disconnect the aerial on casting anchor. Doors, windows, portholes and other means of access to the station will be sealed by the Maritime Authority. These seals can be broken as soon as the vessel leaves the Chilean littoral.

(c) Any vessel, both national and foreign, staying at a Chilean port for longer than three days shall have the aerial dismounted in the presence of the Maritime Authority, and be kept in the station under seal.

(d) Every operator on a national merchant ship who should become aware of any communications being sent contrary to these regulations, is bound to inform the local Maritime Authorities at once, so that they may take the necessary steps.

(e) Any merchant vessel that, owing to long stay at a Chilean port, should require going through and cleaning its apparatus, can do so, upon obtaining a permit from the local maritime authority. The operation to be effected during working hours and in the presence of the said authority, who at the end of the work will again place the seals thereon.

ART. 36.—Where the belligerent persons develop their hostilities in waters distant from the national littoral, the following dispositions will strictly be adhered to:—

(a) Vessels with fixed sailings, following a route within the country, will be allowed to keep their aeriels connected while lying in Chilean ports, provided that their stay is not longer than three days.

(b) The premises occupied by the station will be sealed only when so directed by the superior Maritime Authority.

(c) Those ships having no fixed sailings, or an established route in the country, whatever their nationality, shall, during their stay in Chilean ports, keep their aeriels disconnected from the time they cast anchor.

APPENDIX No. 1.

LICENSE FOR SHIP WIRELESS STATIONS.

1. In conformity with the General Regulations of the Radiotelegraphic Service, of the merchant ships approved by Supreme Decree No. of of representative of the

Company years, is authorised for a period of years, and subject to the undermentioned conditions to instal and use a wireless set on s.s. of the Chilean Mercantile Navy, for the transmission and receipt of service messages, official and private, at a tariff not exceeding that fixed by the International Convention.

2. The employment of the apparatus authorised by this license, is subject to that which is established by the International Convention of Radiotelegraphy, ratified by the Supreme Government, and also to all the regulations dictated from time to time by the authorities, by Government decrees or by new treaties.

3. The firm or company in possession of this license should give all information demanded by the authority in the line of business concerned, in regards to entries and leaveings (in accordance with the Radio International Convention), to messages exchanged between the ship and other stations, and will pay to the said authority, when and how it is so indicated, all sums appearing in the respective accounts.

4. During the working of the station, its apparatus will be in charge, or under the supervision of a person possessing the corresponding title, granted by the Maritime Territory Direction of the Navy.

5. The station will give absolute priority to signals of help or danger, and on receiving or making such signals all other transmission will be stopped and will not be renewed until the communications concerning the ship in danger have been concluded.

6. The station will be ready to transmit danger signals with a normal wavelength assigned by the Radiotelegraphic International Convention, and with sufficient power in order that these signals can be received a distance of 100 nautical miles.

7. The station will use the minimum of energy necessary to effect communications, except in the case of messages concerning ships in danger.

8. The station will exchange communications with any other ship, without distinction of the system of radiotelegraphic installation used.

9. The station should not be used when the ships are in harbour, except in case of danger.

10. The President of the Republic can authorise in war time, strikes, mutinies, etc., to close or dismantle the station, and also, to requisition the installation for the use of the authorities, granting an equitative bonus to the shipowners.

11. The Government inspectors or authorities will be able to inspect the wireless station when it is deemed necessary by the Maritime Territory Direction, or the Radiotelegraphic Inspection.

12. The installation should not be modified in any of the details specified in the form below.

FORM OF THE STATION AND ITS APPARATUS.

Ship
 Number
 Shipowners
 Registered Port
 International Characteristics
 Radiotelegraphic Characteristics
 Class of Service Hour
 Power, primary transformer kw.
 Power of the generating dynamos
 Normal day range with other ships at sea, in nautical miles
 Tariff on board per word

Minimum per radio.....
 System employed.....
 Characteristics of the transmitter used.....
 Type of oscillator.....
 Approximate frequency of spark.....
 Characteristics of the receiver.....
 Type of receiver.....
 Scales of waves of the receiver.....
 from..... metres..... up
 to..... metres.....
 Aerial, number of masts.....
 Height..... Type of aerial.....
 Wire..... Number.....
 Diameter and class.....
 Dimensions required.....
 Emergency apparatus..... Type.....
 Power of the battery.....
 Day range at sea.....

WAVELENGTH.

The normal wavelength for the transmission and receipt will be of 600 metres, the station will be for the use of two waves, one of 600 and the other of 300, such as it is stipulated in the International Radiotelegraphic Convention, and the position of the syntoniser for such waves should be clearly marked.

Where the transmitter radiates two or more waves as indicated by a sensitive wavemeter, the energy of the smaller one shall not exceed 10 per cent. of the energy of the larger one; the logarithmic decrement per complete oscillation, not to be over 0.2, except when signals for help are transmitted; in such cases the transmitter can be syntonised in order to produce a maximum of interference, with a maximum of radiation.

Length of Wave.	Current Wave Amperes.	Decrement.	Reading of the wavemeter.	
			Principal Wave.	Next wave to the principal one.
600 metres				
300 metres				

This license will expire on the.....
 of.....

Radiotelegraphic Inspector.

Director of the Maritime Territory.

Minister of War and the Navy.

APPENDIX No. 2.

REPUBLIC OF CHILE.

TERRITORY MARITIME DIRECTION OF THE NAVY.

TITLE.

For wireless operator of.....
 Class.....
 Inasmuch as..... words per minute.
 has passed the examination satisfactorily in the following subjects:—

(a) Handling, fitting and care of radiotelegraphic apparatus and batteries of accumulators.

(b) Transmission and receipt by ear at a speed of..... words per minute.

(c) Knowledge of the radiotelegraphic service international regulations.

He is granted the title of wireless telegraph operator, Class..... valid for five years.

Valparaiso..... de.....

Note taken on.....

Radiotelegraph Inspector General.....

..... Maritime Territory Director

SECTION III.

RADIO COMMUNICATIONS.

CHAPTER. I.

GENERAL DISPOSITIONS.

C ART. 1.—For the purposes of public correspondence between two ships and between these and the land stations, only the 300 or 600 metre wave shall be used; this limitation may, however, be increased by the Supreme Government when circumstances warrant it.

ART. 2.—Ship and land stations, open to public service, are under the obligation of communicating with one another when one of them so desires.

ART. 3.—Both Chilean and Mercantile foreign vessels navigating along the coast of the Republic, should give preference to official messages of the Chilean national Navy.

Private or public service radiotelegrams transmitted by mercantile ships, for their part, will have precedence over communication practice among the wireless stations of the Navy, except during the hours applied for by the Naval authority.

ART. 4.—When it is desired to communicate with a land radiotelegraph station, the nearest one must be chosen. There being a range assigned to a distant land radiotelegraph station, it is necessary to wait until this is the nearest.

ART. 5.—Every station is obliged not to interfere with the communication of the other stations. To this end it is prohibited to exchange conversations, not connected with the service, among operators.

Likewise it is prohibited to send long series of signals for the syntonisation of the transmitting and receiving apparatus, these operations to be made by means of the trial vibrator. Where it is absolutely necessary to send trial signals, these should be confined to short series, and only after verifying that no other communications are being sent.

ART. 6.—Before starting a call, the wireless station will syntonise its receiver to the regulative wave and will at the same time verify that no communication is being made; otherwise will await the first suspension, unless its call does not disturb the said communication. The same rule will be observed when a call from another station is to be answered.

ART. 7.—(a) Calls for help have priority over all other signals.

(b) As soon as the call for help is perceived all communications will be suspended and will not be resumed until the ship applying for help has finished transmitting its signal.

(c) When a ship making use of the signal for help, adds, after a series of these signals, the characteristic of a certain station, the obligation of answering devolves in the first place upon the said station.

(d) When there is no such indication of characteristic, every vessel perceiving a call for help will answer it immediately. By so doing interference from other radiotelegraph stations will be avoided.

(e) Only one ship must answer at a time.

(f) That ship which believes itself nearest to the danger, will take precedence in its communications over the others (if there are any).

ART. 8.—Those regions wherein the radiotelegraphic service is very considerable (Mancha Sea, etc.), a ship's call to a land radiotelegraph station will, generally speaking, not be made except when the latter is within normal distance of the ship radiotelegraph station, and when the ship reaches a distance inferior to 75 per cent. of the normal range of the said land radiotelegraph station.

ART. 9.—When two or more ships call at one time, the nearest land radiotelegraph station will indicate the order in which the radios are to be transmitted, paying attention to the convenience that the interchange of messages is the maximum, and giving preference to the ship which by its position, destination and speed, will be the first to leave its radius of communication.

ART. 10.—(a) If in spite of the precautions indicated, interference in the radio communications are produced, the land radiotelegraph station, to which the previous article refers, will give the order to wait, giving the approximate duration, and the ship stations are obliged to obey the order.

(b) The ship station will inform the land station of the moment in which it proposes to suspend its communications with other stations, as well as the probable duration of the interruption.

(c) To this respect, it must be borne in mind that the land station is the one which has the command of the communications.

ART. 11.—In case of repeated omissions to comply with this regulation on the part of foreign vessels in communication with the Chilean coast, the necessary steps to punish the culprit will be taken with that Government under whose flag the ship sails. It is the duty of operators on board the Chilean mercantile vessels to record such omissions on their logs, and inform the captains, in order that they may lay these facts before the Naval Authorities.

ART. 12.—The land wireless stations, as it has been directed, will command the public radiotelegraphic service within the radius of its range, excepting the central region of the country, where the said command is performed by the controlling station. In case of danger, the ship station which sends danger signals is the one that commands the communication.

ART. 13.—In the Chilean coasts, in case of war, mutinies, or others to be dealt with by the Naval Authorities, the Chilean fleet will take command of the radio communications in those regions in which they are operating. In such circumstances, all ships either foreign or Chilean, will obey the orders emanating from the said fleet.

ART. 14.—The radio stations are obliged to send the radios when no direct communication can be established between the station of origin and the receiving station, provided that they are in the position of being able to send them.

ART. 15.—(a) Those radiotelegraphic installations on board merchant vessels anchored in the ports of the Republic, where there is a land station, cannot be used for communication with ships other than through the medium of the land station, except in the case of signals for danger.

(b) Any talk, discussion or superfluous signals through the radiotelegraph is strictly prohibited, the communication is to be limited to what is necessary for a good service.

(c) Similarly, it is prohibited to interrupt a conversation between two stations in order to call a third one, save in the case of danger, or when it is a question of a call for "general stop." In such cases it will be necessary to wait till the transmitting station has finished, to begin immediately afterwards the call in question.

(d) All communications, except in the case of signals for help or danger, are prohibited, when the ship is anchored in any port of the Republic.

CHAPTER II.

ACCEPTANCE, TAXATION AND PAYMENT OF RADIOTELEGRAMS.

ART. 16.—(a) It is prohibited either to add to, or withdraw any words or punctuation signs from the messages, it is only allowed to add the customary notations of the service.

(b) When the message has not been written on the radiotelegram regulation form, the paper containing it will be affixed to the said form.

(c) When the drawing up or writing of a radiotelegram is not sufficiently legible, the radiotelegraphist will call the attention of the sender in order to make the respective corrections. A similar procedure he will observe in case of their being errors in the spelling.

ART. 17.—The messages will be classified in three categories, namely:—

(a) Officials.—Those from the Government, Commander-in-Chief of the Fleet, Commander-in-Chief of the Land and Diplomatic Forces.

Those relating to the safety of the State or public order, and those of exceptional urgency, such as wrecks, fires, earthquakes, or other calamities, communicated by the authorities, or addressed to them, and the replies to them.

(b) Service.—Those received from the inspectors and sub-inspectors of the national radiotelegraph service; those exchanged by the captains between one ship and another, for mutual information concerning the conditions of the navigation; those exchanged by the captains with the maritime authorities, or *vice versa*, with the same object; those radios of the service not rated as well as the meteorological ones.

(c) Private.—Those intended for public correspondence. In these are included press messages and rated service notices.

ART. 18.—Generally, the radiotelegrams are transmitted in the order that they are received; but subject to their category, the following scale will be adopted:—

(a) Official radios, priority to urgent ones.

(b) Service radios, priority to urgent ones.

(c) Private radios, priority to urgent ones.

ART. 19.—(a) Every national ship in communication with any station, will number each radio, beginning with number 1 to 6 hours of the first day of each month. This number will be determined in accordance with the order set out in the previous article.

(b) In the retransmission of messages, two numbers will be sent as a maximum; first, the number of the original station, and, second, that of the station concerned, and separating both by a fraction mark.

ART. 20.—The parts composing a message, in the order of their transmission, are as follows:

- (a) Preamble and special remarks not rated.
- (b) Special remarks rated.
- (c) Address.
- (d) Text.
- (e) Signature.

ART. 21.—The preamble is composed of:—

- (a) Prefix:—These are—"S" for official radios; "A" for service radios; "ST" for rated service radios; "Z" for press radios; and "D" for urgent radios.
- (b) Name of the office of destination.
- (c) Word "of" followed by the name of the office of origin.
- (d) Number of the radio's origin.
- (e) Number of rated words.
- (f) Total number of rated and unrated words.

(g) Date and hour handed in. The hours are counted from 0 to 24, beginning at midnight.

(h) Special remarks not rated, such as:—Route to follow, course followed (when it is not clear), wording maintained (when it is confused).

ART. 22.—Following the preamble and before the address, the rated special remarks, are transmitted, as—"RP" "fr"..... reply paid..... words.

These remarks are rated and count as one word.

ART. 23.—The address is made up of:—

- (a) Name of the addressee; and
- (b) Place of destination and address, and other indications for facilitating the delivery of the radio (in accordance with the international list of offices).

ART. 24.—The text of a radiotelegram can be rendered:—

- (a) In a known language.
- (b) In secret language. The latter is divided into agreed code and cipher code. The messages might be set out entirely in either one of these languages, or in conjunction with one another.

ART. 25.—The signature, as also the address and the text, must be written in legible form. The signature is not compulsory.

ART. 26.—(a) Address.—As concerns the rating of the words, this will be as follows:—

- (1) All the words written by the sender to be counted.
- (2) The name of the station or office of destination will be counted as one word, whatever the length.
- (3) When the name of a country, province, department, etc., or district (shown in the International List) is added, to distinguish one office from another of the same name, the words will be joined together to form one, which will be transmitted and rated as one word.
- (4) The name of a country or district will be charged for if the sender should add it on unnecessarily.
- (5) The remainder of the address will be charged for in accordance with the rules for counting the words in common language.

(b) Text.

(1) In common language.—The maximum of letters allowed per word is 15; if a word is composed of more than 15 letters it will be charged as two words.

Those words from which one or two letters have been suppressed, as against the use of the language will not be admitted.

(2) Agreed Code.—In agreed and commercial codes, recognised by telegraphic administrations, messages are counted and charged for at the rate of 10 letters per word.

(3) Cipher Codes.—In secret and cipher codes messages are counted and charged for at the rate of five letters or numbers per word.

(c) Signature.—The signature, when it is sent, will be charged for in accordance with the rules given for the common language.

ART. 27.—(a) Ordinary compound words and names of towns, provinces, countries, etc., as well as names of ships, or families, will be charged for as a word, when they are joined (without dash), and provided that they do not contain more than 15 letters.

(b) Compound words joined with a dash or apostrophe, are counted according to their number; the dashes or apostrophes will be charged for as additional words, should the sender insist on their transmission.

(c) When the name of a street, circus, etc., is made up of several words and written as one, it will be computed as one word, provided it does not contain more than 15 letters; but the expression "calle," "plaza," "avenida," "street," "strasse," "rue," "boulevard," etc., will be counted as one additional word or the purpose of the rating.

(d) In German and Dutch languages the words strasse, platz, stratt, can be joined to the name of the street or circus, and then, they will not be charged as additional words, if the combination does not exceed 15 letters.

(e) Compound numbers, in a form contrary to the general use of the language (for example, doscientos diez), will be admitted as only one word when they do not exceed 15 letters.

ART. 28.—(a) Radios set out, partially in ordinary language and partially in code, will be charged at the rate of 10 letters per word, in both cases.

(b) The groups in cipher code, sent in this class of message, will be counted at the rate of five letters or ciphers per word.

(c) When a radio is entirely written in ordinary language and cipher groups, the first will be counted at the rate of 15 letters per word, and the second at the rate of five (letters or ciphers) per word.

ART. 29.—(a) The dashes or strokes that are only intended to separate the different words or groups composing a radio are not to be transmitted or charged for.

(b) Punctuation signs, apostrophes or dashes (except when used in the formation of numerals, commercial marks, etc.), will only be transmitted if the sender desires it: in such a case the said signs will be counted and rated as isolated characters.

(c) When a word or phrase is underlined, it is rated and counted as an additional word.

(d) The two parenthesis signs, () and the inverted commas " " will be counted as one word.

(e) Interrogation ? and exclamation ! signs will be counted as one word.

ART. 30.—(a) Isolated characters.—Whether a letter or cipher, it will be counted as one word.

(b) Groups of characters.—(Letters or ciphers).—Those groups of letters forming commercial marks, or expressions, such as, CIF, FOB; groups of letters of current use, such as RSVF, RIP, QEPD, and groups of ciphers, will be counted at the rate of five letters or ciphers per word.

(c) EXAMPLE OF COMPUTATION OF WORDS:—

Words.	Number of Characters.	Number of words rated.	
		Address.	Text.
New York	—	1	2
Newyork	—	1	1
London England (word England unnecessary)	—	2	2
Peña Blanca San Fernando (name of an office)	—	1	4
Calle Barros Arana	—	3	3
Calle Barrosarana	—	2	2
Callebarrosarana (contrary to the use of the language)	—	2	2
Leipziger Platz	—	2	2
Leipzigerplatz	—	1	1
Kronprinzessin Cecilie DKA (name of an office)	—	1	3
Maipo CAB or Maipo CBU (name of an office)	—	1	2
Kronprinzessin Cecilie	21	1	2
Van de Brande	—	3	3
Vandebrande	—	1	1
O'Higgins	—	2	2
Ohiggins	—	1	1
13½	5	1	1
133½	6	2	2
137th or 1374°	5	1	1
1374th or 1374me	6	2	2
106A (number of a house)	4	1	1
46231	5	1	1
46·231	6	2	2
29/32	5	1	1
34·38	5	1	1
2 %	4	—	1
2 p %	—	—	3
197A/199A (company mark)	9	2	2
Ch23 (company mark)	4	—	1
G.H.F. (company mark)	6	—	2
GHF45 (company mark)	5	—	1
2 p.m.	—	—	2
2.15 p.m.	—	—	2
N42E (demarcation of a ship) (three groups)	—	—	3
75·23 O. 24·15 S. (position of a ship) (four groups)	—	—	4
158·12 E. 24·15 S. (position of a ship) (five groups)	—	—	5
Radiotelegraphy	16	2	2
Radiotelegraphy (underlined)	—	3	3
Sextyzlargs (ciphered code)	11	—	3
398499 (ciphered code)	6	—	2
23877 (ciphered code)	5	—	1
Accentuated (agreed code)	10	—	1
Electricano (agreed code)	11	—	2
(For example)	—	—	3
"Mercurio" (the inverted commas counting as one word)	—	—	2
¿ Por que? (each sign of interrogation is counted as one word)	—	—	4
Diec'ocho	—	1	1
Diez y ocho	—	3	3
Cientochenta (international computation)	—	1	1

Words.	Number of Characters.	Number of words rated	
		Address	Text.
Cientochenta (contrary to the use of the language) as per the State Telegraph	—	2	2
Sinembargo	—	—	1
Aujourd'hui	—	—	1
Aujourd'hui	—	—	2
Formula b	—	—	2
E M (isolated letters, initials of surname)	—	2	2
EM (ditto, joined abusively)	—	2	2
A bordo	—	2	2
Abordo	—	1	1
Enseguida	—	—	1
Contralmirante (contrary to the use of the language)	—	2	2
Contralmirante	—	1	1
Aunque	—	—	1

(c) *Combined groups of characters.*—(Letters and ciphers.)—Combinations of ciphers and numbers forming commercial marks, or number of a house, such as B Bis, OA₃ 13A, will likewise be counted at the rate of five characters per word.

(d) *Groups in the Address.*—Such will not be accepted and any other letter in excess of those forming names or words, will be surcharged and counted as separate words.

(e) *Letter Ch.*—The combination of Ch, which is counted and transmitted as only one letter in the ordinary language message, or agreed code of words in a known language, will be rated as two letters in those of cipher and agreed code formed by words of no particular language.

(f) *Groups with punctuations, signs, and fraction marks.*—The groups wherein appear full-stops, commas, dashes and fraction marks to form commercial expressions will each be counted as one letter or cipher.

ART. 31.—The rates payable in the Chilean coast will be as follows:—

(a) By merchant ships the rate of 40 centimes per word, with a minimum value corresponding to ten words.

(b) For land stations, at the rate of 60 centimes per word, with a minimum value corresponding to ten words.

ART. 32.—(a) *Radios exchanged between two merchant ships.*—The rate for the radios exchanged between merchant ships, without the intervention of a land station, will comprise the rates on board the ship of origin and destination, supplemented with the rates on board the intermediary stations.

(b) *Radios from a mercantile ship to a land station.*—When a radio sent from a ship to a land station passes through one or two ship stations, the rate includes, besides that of the ship of origin, that of the coast station and that of the telegraphic lines, the rate on board of each of the ships that have taken part in the transmission.

(c) *Radios from a merchant ship to a warship, or vice versa.*—The radios exchanged between a merchant ship and a national warship, will be subject to the same rates as above, except when it concerns officials, classes or crews of the warships, in which case these will only pay the corresponding tariff to the merchant ship and that of the warship, which is 500 centimes per word.

(d) *Reply paid.*—Private radios with reply paid, besides the rate for sending the radio, will pay the corresponding amount for the said reply.

ART. 33.—Any difficulty that may arise in rating private radios, in other cases than aforementioned, will be dealt with in accordance with Articles 16, 17 and 18, Chapter IV, of the Service Regulations annexed to the International Radiotelegraph Convention.

ART. 34.—Shipowners, proprietors, or shipping companies will render monthly their accounts to the General Direction of Telegraphs, when their ships have sent messages through the medium of the land stations, or by way of the State Telegraph lines.

ART. 35.—(a) *Radio Record Book of the Station.*—In this book will be noted the following particulars of the radios: Number of origin, total number of words, hour handed in, situation of the ship of origin, if known, hour of transmission, hour of reception, special remarks and signature of the operator. The text will not, therefore, be written.

(b) *Filing of radios.*—The originals of the radios, together with the documents relating to them, will be kept at least eighteen months in the station of the ship.

CHAPTER III.

TRANSMISSION AND RECEPTION OF RADIOS.

ART. 36.—(a) The International Morse Code signals will be used, and the speed of transmission will be more or less 20 words per minute, reckoned at the rate of five letters per word.

(b) The International Code of Signals which was originally prepared for flag signals is sometimes used in radiotelegraphy between ships of different nationalities.

(c) For notices and enquiries of the service, the operators will make use of the Radiotelegraphic Code of Abbreviations annexed to the Service Regulations of the Radiotelegraphic International Convention.

ART. 37.—The following signals will be used:—

- (a) Preliminary call — • • • • •
- (b) Separation — • • • • •
- (c) Invitation to transmit — • • •
- (d) To wait — • • • • •
- (e) Acknowledge receipt — • • •
- (f) End of transmission — • • • • •

ART. 38.—(a) The call consists of:—

- (1) The preliminary call — • • • • •
- (2) The characteristic of the destination station, repeated three times, and
- (3) The word "of" followed by the characteristic of the transmitting station, repeated three times.

(b) The destination station replies as follows:—

- (1) Preliminary call — • • • • •
- (2) Characteristic of the original station, repeated three times.
- (3) Word "of" followed by its own characteristic.

(4) Invitation to transmit — • • • in case it is ready; otherwise, the signal to wait — • • • • • followed by a cipher, indicating the number of minutes he has to wait.

- (5) End of transmission — • • • • •

ART. 39.—The steamship *Maipo* "CDH" wishes to transmit a radio to the steamship *Cachapoal* "CDF."

(a) *Call.*—The *Maipo* will send the following signal: — • • • • •

CDF CDF CDF — • • • • • CDH CDH CDH.

(b) *Reply.*—The *Cachapoal* will reply:

(1) — • • • • • CDH CDH CDH — • • • • • CDF — • • • • • in case it is ready for communication.

(2) Otherwise, if the stop is of five minutes, will reply:

— • • • • • CDH CDH CDH — • • • • • CDF — • • • • •

ART. 40.—If after having repeated the call three times, with an interval of two minutes the station of origin does not receive a reply it will call again in the same manner after 15 minutes, provided that no other communication is being sent.

ART. 41.—Every station on board that calls a land station, after complying with what is set out in Art. 39, will make known:—

(a) The distance of the ship, in nautical miles, from the coast station.

(b) The position, in concise form.

(c) The next port it is making for.

(d) The number of radios of normal size, if they are of exceptional length, or the number of words.

(e) The speed per hour will not be indicated unless it is expressly asked for by the coast station.

ART. 42.—The s.s. *Maipo* "CDH," on a voyage to Callao, is situated at 150 miles to the north of Valparaiso, CCE station, the radiotelegraph station being at 170° exactly, and has 75 words to be transmitted.

After calling and receiving the invitation to transmit, it will act as follows:—

—●●●●● CCE from CDH —●●●●●
QRB 150 QRC 170 QRD Callao 75
—●●●●●

Such communication is called time rush ("T R"), and appears jointly with QRB QRC and QRD in the abbreviations list annexed to the present Regulations.

ART. 43.—The reply from the land station may be in any one of the following examples:—

(a) —●●●●● CDH from CCE R TR 50 QSG —●●●●● (meaning "time rush received. I have radios with 50 words for you; transmission will be made by series of 5 radios").

The station on board will acknowledge receipt, and the one on land will transmit five radios, provided such transmission does not exceed 15 minutes.

(b) —●●●●● CDH from CCE R TR 50 QSG —●●●●● (signifying: "received time rush. I have radio with 50 words; transmit").

The station on board will transmit the five messages, provided it does not take longer than 15 minutes in transmitting it.

(c) —●●●●● CDH from CCE R TR 50 QSF —●●●●● (meaning: "received time rush. I have radios for you with 50 words; will transmit messages, alternating with one another").

The station on board will acknowledge receipt and that on land will transmit its first message; the ship will forthwith acknowledge receipt again, transmitting in its turn its first message, and so on alternately.

(d) —●●●●● CDH from CCE R TR 50 QSF —●●●●● (i.e., "received time rush. I have radios for you with 50 words; the transmission will be made alternatively. You first.")

The station on board will begin the transmission of its first message, and once the acknowledgment is given by the coast station, this, in its turn, will proceed to give its first message.

When radiotelegrams are exchanged between two ships the fixing of the order of transmission devolves upon the ship called up.

ART. 44.—(a) Every transmission of messages will be preceded by the signal —●●●●● and ended by —●●●●● followed by the characteristic of the station of origin and the signal —●●●●●

(b) When messages of over forty words are transmitted, the station of origin will be able to interrupt the transmission, by using the sign of interrogation —●●●●● after each series of twenty words, and will not be able to begin again while the station of destination does not repeat correctly the last word, followed by the invitation to transmit —●●●●●

(c) In the transmission of series of messages, the characteristic of the station of origin and the signal —●●●●● will only be given at the end of the said series.

ART. 45.—After assigning to the radio the number corresponding to it, and verifying the number of words and hour handed in, the transmission of the message will be proceeded with as follows:—

(a) *Process*.—Signal of preliminary call, prefix (if there is any), radio number of the ship or origin, number of the radiotelegram,

number of words, date and hour handed in, service instructions (if there is any), separation signal, eventual observations (if any), separation, address, separation, text, separation, signature, sign of the end of the message, characteristic of the station (ship) transmitting invitation to transmit.

(b) *Example*.—●●●●● radio Aysen, 1-10-12 (12th day of the month) 9.35 (9.35 hours) —●●●●● Gutiérrez, Prat Street, Valparaiso —●●●●● will arrive to-morrow at 3 p.m. —●●●●● Gonzalez —●●●●●
CDB —●●●●●

ART. 46.—Once the radio is assigned a number, it will be transmitted as follows:—

(a) *Process*.—Signal of preliminary call, prefix (if any, radio, number of the office of origin, number of origin, followed by fraction mark and number assigned to the radio by the land station, number of words, date and hour of deposit, instructions of service (if any), separation, eventual indications, separation, address, text, signature, signal of end of message, characteristic of transmitting station and signal of invitation to transmit.

(b) *Example*.—●●●●● radio Valparaiso, 915-1 13-12 12 9.35 —●●●●● Riveros Aysen Valparaiso —●●●●● will go on board to meet you. Please take freight No. 215bis —●●●●● Gomez —●●●●● CCE —●●●●●

ART. 47.—Presume that the ship *Huasco* retransmits the official message No. 5, with 16 words, as per telegraphic computation, but with only 13 actual words, which was deposited in the wireless station of the cruiser *Chacabuco*, on the 12th day of the month, at 9.35.

(a) *Process*.—Signal of preliminary call, prefix "S," radio, name of office, ship or station of origin, number of the radiotelegram, number of words, date and hour handed in, service instructions, separation, incidental remarks (if any), separation, address, separation, text, separation, signature, end of message, characteristic of the transmitting station, signal of invitation to transmit.

(b) *Example*.—●●●●● S radio *Chacabuco* 5-16-13 12 9.35 via steamship *Huasco* —●●●●● General Director of the Navy, Valparaiso —●●●●● Fleet anchored safely cymrxz ohtlrd cadmzw —●●●●● Admiral Gomez —●●●●● CDC —●●●●●

ART. 48.—(a) When a radio is received, the words will be counted, and if this coincides with the number given, an acknowledgment of receipt in conformity will be sent, using the letter R, followed by the numbers of the message, as follows:—CDC —●●●●● 19 CDH (station of origin. Received in conformity. Station of destination).

(b) The acknowledgment of receipt in the messages by series will be given after the transmission of each radio.

ART. 49.—The date and hour will be pointed out by means of two groups of ciphers, the former being transmitted first, and then the latter with its minutes.

Thus, the 12th day, 2.45 p.m., will be transmitted as follows:—

12 14 45

ART. 50.—When the true quantity of words is different to that rated, it will be marked out as a fraction, first transmitting the number of words rated followed by the fraction mark and by the true number of words,

If a message has 20 words, but for the purposes of rating is counted as 22, it will be transmitted as follows:—

22 — • • • • • 20

ART. 51.—(a) The end of correspondence between two stations will be marked out by the signal • • • • • followed by the characteristic of the transmitting station.

(b) It is strictly prohibited to use the word "nil."

ART. 52.—(a) Example of transmission:—

(1) *Message*.—On November 4th, the Chilean s.s. *Huasco* wishes to transmit to the land station at Valparaiso, the following message: No. 16; hour of deposit, 2.15 p.m. Number of words rated, 15; actual number, 13.

Jiménez—Echaurren 515 Santiago—Buy 100 coal shares "Curanilahue" price 162—Gonzalez (inverted commas maintained by the sender).

(2) *Transmission*.—Such message will be transmitted as follows:—

— • • • • • radio Huasco 16 15/13 4

1415
— • • • • • Jiménez Echaurren 516
Santiago.

— • • • • • Please buy 100 coal shares
Curanilahue.

— • • • • • price 162 one/2 — • • • • •

Gonzalez — • • • • •

(b) *Reception in conformity*.—The receiving station will, after verifying the number of words, transmit the acknowledgment of receipt, as follows:— • • • • • CDC — • • • • •
R 16 15/13 — • • • • • CCE — • • • • •

In the case of messages having words in code, these will be repeated when acknowledging receipt.

(c) *Reception not in conformity*.—

(1) Doubtful reception of a part of the message.

If by any circumstance the words following "carboníferas" (coal) are not received, the repetition will be asked for, thus:—

CDC — • • • • • carboníferas (coal)

— • • • • • CCD — • • • • • The transmitting station will reply CCE carboníferas (coal)

— • • • • • Curanilahue — • • • • •

price 162 one/2 — • • • • • Gonzalez

— • • • • • CDC — • • • • •

(2) *Error in the number of words*.—If the receiving station is not agreed upon the number of words, it will signal it thus:—

— • • • • • CDC 14/12 — • • • • •

CCE, presuming it has not received the word 162.

The transmitting station will repeat the message, giving only the first letter of each word, so as to enable the receiving station to verify where the mistake is and ask for a repetition accordingly.

ART. 53.—(a) When the signals are doubtful and weak every device must be taken to effect the transmission.

(b) The last radio can be repeated as much as three times, if the receiving station so demands, and, if in spite of such threefold repetition the signals are still illegible, the message will be given up as cancelled.

(c) If no acknowledgment is received, the transmitting station will call as many as three times, and failing to receive an answer the communication will be abandoned.

In such cases the transmitting station has the right of obtaining an acknowledgment by a service notice sent through the intermediary of another station in the country, or even by utilising the telegraphic lines of the State.

(d) If, in spite of the bad reception, the receiving station esteems that the message could be sent, the acknowledgment will be given, adding at the end of the preamble the words "doubtful reception."

(e) In the event of the ship transmitting again the radio to another station of the same administration, only the rates corresponding to one transmission will be charged.

ART. 54.—When a radio contains numbers, difficult names, or doubtful words, it will be transmitted slowly in order to avoid errors.

All doubtful words and numbers will be repeated on acknowledging receipt.

ART. 55.—All radios in Code will be repeated by the receiving station; this does not acknowledge it until it receives the confirmation of the transmitting station.

ART. 56.—(a) The preamble of a notice consists of:—

(1) The prefix A.

(2) Names of the offices (or stations) of destination and origin, separated by the word "of."

(3) The date and hour of deposit.

(4) Service notices do not bear either numbers or signature in the transmission, but it is the duty of the operator transmitting a notice, to sign the formulary with his initials.

(b) In the text of a service notice exchanged between a ship and a land station, the radiotelegram, giving the notice of service, will be designated by:—

(5) The number of origin, and serial (as the case may be).

(6) The date written in words, and not in ciphers.

(7) The name of the addressee (and his address in case of non-delivery).

ART. 57.—(a) The station on board informs the station of origin that the radiotelegram could not be delivered to the addressee. — • • • • •
To Constitution from ABC 15 11 55 — • • • • •
321 5 fourteen Guzman addressee is not on board — • • • • •

In this message Constitution is the office of origin of the radiotelegram, which is informed that Guzman, the addressee, is not on board the ship, the characteristic of which is ABC. The ciphers 15 11 55 stand for the date and hour of deposit of the service notice; and the word "fourteen" (catorce) gives the date of the radio under consideration, whose number of origin is 321, and the serial assigned to it in the land station is 5.

(b) The ship station, having received a notice of non-delivery, discovers an error in the transmission of the address, and then sends a service notice, rectifying the said address, thus, — • • • • •
To Limache from ABC 15 3
15 S — • • • • • 15 fourteen (catorce) read
Ayala calle Blanca 38, I repeat 38 — • • • • •
— • • • • • This indicates that there has been an error in the number of the house, which should read 38 instead of the number previously indicated.

(c) Some of the words and phrases in current use in service notices, are given hereunder:—

Spanish.	English.	French.
Destinatario.	Addressee.	Destinataire.
Desconocido.	Unknown.	Inconnu.
Se fué.	Left.	Parti.
No está a bordo.	Not on board.	Pas a bord.
Ya no está a bordo.	No longer on board.	Plus a bord.
Muerto (difunto).	Deceased.	Décédé.

No. está regis- Not registered. Pas en registre
trado.

Rehusado.	Refused.	Refusé.
Para.	For.	Pour.
Repita.	Repeat.	Repetez.
Ya.	Already.	Déja.
Entregada.	Delivered.	Remis.
Remita.	Deliver.	Remettez.
Anula.	Cancel (or annul).	Annulez.
Respuesta pagada.	Reply paid.	Repose payée.
Léase.	Read.	Lisez.
Reemplazar.	Replace.	Remplacer.
Colacionado.	Radiotelegram be repeated.	Collationne- ment.

ART. 58.—(a) Call for help: SOS.
Ships in danger will make use of the signal for
help: • • • • • repeated at short
intervals and followed by the particulars
required.

(b) General call: CQ.

(1) When it is desired to enter into com-
munication with any radiotelegraph station,
whose characteristic is unknown, the general
call will be used:—

— • • • • —
followed by the word "of" and the
characteristic of the station of origin, repeated
three times.

(2) Every station receiving this signal, will
reply as laid down in Clause (b) of Art. 39.

(c) Call for general stop: F.

(1) When a radio station receives the signal
• • • • • repeated three times and at
intervals, it should immediately suspend
all radio communications, for this order
proceeds from the Chilean Navy.

(2) The only exception to this rule is when
a signal for help is received.

(3) The general stop will last until the
naval station, which ordered it, removes it.

(d) Call for using International Code: PRB.
The characteristic of one station, followed
by the signal: • • • • •
signifies that the ship or station calling, wishes
to communicate with the station called by means
of the International Code of signals.

SECTION IV.

SCHOOL FOR MERCANTILE RADIOTELEGRAPH
OPERATORS.

EXAMINATIONS AND TITLES.

CHAPTER I.

WORKING OF THE SCHOOL FOR MERCANTILE
RADIOTELEGRAPH OPERATORS.

ART. 1.—The purpose of the School for
Mercantile Radiotelegraph Operators is:—

(a) To instruct and form the staff of
operators intended for service in the National
Mercantile Navy.

(b) To keep the general statistics of the
staff of operators existing in the National
Mercantile Navy.

ART. 2.—The School of Operators for the
service of the Mercantile Navy will be directly
dependent upon the Maritime Territory Direction
of the Navy, and all communications of what-
ever kind such may be, will be made through
the intermediary of that authority.

ART. 3.—The school will be domiciled in
the premises which the Maritime Territory
Direction will set up for the purpose.

ART. 4.—The school for operators will be
equipped with the following elements:—

(a) A library of educational books for the
instruction of the staff.

(b) Morse manipulators, electromagnetic
vibrators, dry cells, and pairs of receivers in
sufficient number as there are students.

(c) An Omnigraph apparatus for trans-
mission.

(d) Office and school apparatus.

(e) Tools and other articles for experiments
and practical teaching.

ART. 5.—The teaching staff will be as follows:

(a) A director of the course who might be
the radiotelegraph inspector.

(b) A teacher of electricity, radiotelegraphy,
practical working, and mastery of the regula-
tions, and

(c) A Morse instructor.

ART. 6.—The duties of the instructors will be
as under:—

(a) Director.—(1) To conduct the course,
attend to the good instruction of the staff
and the correct service of the school.

(2) To propose to the Maritime Territory
Direction the appointment of those operators
who have passed the final examination of the
course.

(3) To propose to the above-named
authority any reforms to the regulations
which he deems necessary as also to the
syllabus for examinations, and time tables
of the classes.

(4) To preside at all examination meetings.

(5) To keep the statistics of the course,
and send a monthly report showing its actual
working to the Maritime Territory Direction.

(6) To share, when it is necessary, the tasks
of the instructors, or to assume his post
whenever he is obliged to absent himself.

(b) Electricity and Radiotelegraphy In-
structor.—(1) To have under his personal
charge the theoretical and practical in-
struction in the subjects of electricity and
radiotelegraphy, in conformity with the
syllabus given in the present regulations.

(2) To keep the book of the daily attendance
of the pupils.

(3) To keep notes of the conduct and
advancement of the pupils in the subject
which he teaches.

(4) To propose to the director of the course
those reforms, which in his opinion, would
improve the syllabus and time tables of the
classes.

(c) Morse Instructor.—(1) Will have under
his personal charge the practical instruction
of Morse.

(2) To keep the manipulators, vibrators and
cells in good working order.

(3) To help the instructor in all experi-
ments.

(4) To keep the book of daily attendance
to his classes.

ART. 7.—For the efficient working of the
school the following documents and books will
be kept:—

(a) Investment of money. In this book will
be entered in detail, supported by its
respective voucher, every expense incurred,
either in salaries of the staff or in appliances
for the course.

(b) Statistics of operators, examinations
and titles.

(c) General attendance.

(d) Notes of conduct and advancement
in the various subjects.

(e) File of communications sent.

(f) File of communications received.

ART. 8.—The duration of the course for
operators of the National Mercantile Navy will
be as indicated in the table below, *i.e.*, eight
months comprising 400 hours of instruction:—

Periods.	Duration in months.	From	To.
Preparatory	3	1st August	31st October
Theoretical	3	1st November	31st January
Practical	2	1st February	1st March

The above periods will be distributed as follows:—

(a) *Preparatory*.—This will comprise, in accordance with the syllabus in the appendix, the following subjects:—

Revision of arithmetic, and algebra, electricity and Morse.

At the end of such period, a partial examination will be taken to select those students, who, in the opinion of the teaching staff, have not sufficient knowledge to go on.

(b) *Theoretical*.—The subjects dealt with in the previous period (excepting arithmetic and algebra) will here be extended and the subjects of electricity and radiotelegraphy will be taught.

(c) *Practical*.—The teaching of Morse will here be continued, and the students will receive instruction in the practical handling of a radiogram, the practical workshop and regulations.

ART. 9.—As the object of this course is to meet the requirements of the daily life imposed on the students, the classes will be held after working hours, and in accordance with the time table set up by the directing staff.

ART. 10.—The course will have a capacity for 40 students, in order that there are not less than 50 per cent. when the selection is made at the end of the first period.

ART. 11.—Such faults as may be committed by the students will be punished in accordance with their gravity, as follows:—

(a) Simple reprimand by the instructor.

(b) Severe reprimand by the director, in the presence of the rest of the students.

(c) Expelled from the course, which will be decreed by the Maritime Territory Direction, upon the advice of the director of the course.

CHAPTER II.

ADMISSION OF STUDENTS.

ART. 12.—Those candidates who wish to study the Course for operators of the National Mercantile Marine, could present themselves to the examination for admission, on application on sealed paper (in accordance with the Stamp Law) to be addressed to the Maritime Territory Direction in the first fortnight of the month of July, and must fulfil the following requirements:—

(a) To be Chilean or nationalised, in compliance with the laws of the Republic.

(b) To be of any age between 18 and 30 years, attested by the respective birth certificate.

(c) To appear in the Military Register, or to have complied with the Law of Recruits and Deputies, supported by the respective documents.

(d) To be healthy and of good constitution consistent with the life on board and that calling.

(e) To exhibit proofs of good conduct and character, by means of certificates from the school where educated and from past employers.

(f) To have been vaccinated, or to have had smallpox. N.B.—The application must contain the address of the person concerned.

ART. 13.—(a) The Maritime Territory Direction will communicate with the applicants, advising their acceptance or rejection, before the 25th July.

(b) In such communications the candidates accepted will be told the date, hour and place of examination.

ART. 14.—All candidates will be submitted to an oral or written examination dealing with the following subjects:—

(a) *Arithmetic*.—The four simple rules, decimals and fractions, metrical system and some other easy problems in connection with the application of these rules.

(b) *Spanish*.—To read and write correctly, and to compose clearly.

(c) Any advanced knowledge possessed by the candidate in grammar, electricity, signals, Morse telegraphy and languages, will be recorded.

ART. 15.—The examinations for admission will be carried out by a commission composed of the following persons:—

(a) *In Valparaiso*.—The director of the course, the instructor in radiotelegraphy, and the instructor of Morse.

(b) *In the naval stations*.—Two officials and one naval operator appointed by the Commander-in-Chief.

ART. 16.—(a) The duration of the examination will be that which the commission thinks necessary to give them an idea of the knowledge and aptitudes of the candidate.

(b) The marking for the examinations, both written and oral, will be secret, from 0 to 10, 0 signifying "poor," 5 "fair" and 10 "very good."

The intermediary numbers serve for graduating the differences.

(c) To pass, the candidate must obtain a sufficient majority of marks.

ART. 17.—The commission will draw up a report of all the proceedings, which will be signed by each one of its members, wherein will be noted:—

(a) The candidates presented.

(b) The candidates passed, and

(c) Those rejected, will take back their papers.

CHAPTER III.

EXAMINATION OF THE STUDENTS.

ART. 18.—(a) As laid down in Clause (a), Art. 8, of the present regulations, an examination—in the subjects appearing in the first part of each syllabus—for selecting the students, will take place at the end of the first period of instruction.

(b) This examination of selection will be performed by the directing staff of the school, and the word "passed" or "rejected" will be sufficient for the student continuing the course or being definitely excluded from it.

(c) Immediately the examination is carried out, the director of the course will get into communication with the Maritime Territory Direction.

ART. 19.—(a) At the end of the third period, the final examinations, both written and oral, will take place, of which function the Maritime Territory Direction will be informed by the director of the course.

(b) The Maritime Territory Direction will fix the date for the examination, appointing such delegate as he esteems best, for him to be present at the said examination and to sign the proceedings.

ART. 20.—(a) This will be composed of, besides the delegate, the members appearing in Clause (a), Art. 15, of the present Regulations.

(b) The marking will be governed by that laid down in Clauses (b) and (c), Art. 16, of the present Regulations.

(c) The acts of the examinations will be drawn up in accordance with Art. 15 of the present Regulations.

ART. 21.—The duration of the final examinations will be at least that which is given below:—

(a) For electricity: 20 minutes.

(b) For radiotelegraphy: 30 minutes.

(c) For Morse: 15 minutes.

ART. 22.—As soon as the examinations are finished, the results will be communicated to the Maritime Territory Board by the director of the course, who will enclose a copy of the proceedings with the order of merit of the examinees.

ART. 23.—(a) With the results of the examination before him, the Maritime Territory Director will issue the titles of Second Class Operators to the students approved, fixing the order of priority according to the average note.

(b) Such priority is established as an appreciation of the capacity of the operators.

CHAPTER IV.

EXAMINATION FOR SECOND AND FIRST CLASS OPERATORS.

ART. 24.—Every person who, without having gone through the course laid down in these Regulations, wishes to secure a post of Second Class Operator in the Mercantile Navy, should apply to that effect to the Mercantile Territory Director, requesting that such appointment be granted to him by the commission of examinations concerned.

The applicant must fulfil the conditions laid down in Clauses (a), (b), (c), (d), (e) and (f) of Art. 12., Chapter II of the present Regulations.

ART. 25.—(a) The Maritime Territory Director will supply the application form, and with it, if the decision is favourable to the applicant, call a meeting of the commission of examinations, which, if there is no school, will be composed of the radiotelegraphy inspectors, his assistant and an operator.

(b) The subjects to be dealt with in the examination will be those given in the syllabuses of the present Regulations.

(c) The marking and other processes will be the same as those laid down in Arts. 14 and 15 of the present Regulations.

(d) The candidates passed in this examination will receive from the Maritime Territory Direction the title of Second Class Operators.

ART. 26.—Second Class Operators can be promoted to First Class Operator, if they are able to comply with the following requirements:—

(a) Two years at least at sea, having served actively in radiotelegraphic stations on board a ship. This time to be supported by certificates on official lines written out by the commanders under whom served.

(b) To have observed good conduct, and fulfilled technical obligations.

(c) To address an application to the Maritime Territory Director, requesting an appointment by the commission concerned.

The applicant to be able to fulfil the requisites enunciated in Clauses (a), (b), (c), (d), (e) and (f) of Art. 11, Chapter II, of the present Regulations.

ART. 27.—(a) The conditions of the examination will be the same as those laid down in Art. 24, Clauses (a), (b) and (c), except that the candidate will be required to be able to do a speed of 20 words per minute in the transmission and reception of messages, reckoned up at the rate of five letters to a word.

(b) The candidates passed in this examination will obtain from the Maritime Territory Director the appointment of First Class Operators.

ART. 28.—All operators' titles will be valid for five years, these being withdrawn if the person concerned fails to comply with the requirements set out as under:—

ART. 29.—The operators' titles in the Mercantile Navy will be withdrawn if the operators during two years have not served as such for six months at least.

ART. 30.—Similarly, the operator might be suspended temporarily, or his title be definitely withdrawn from him by the authority who gave it to him, who is suffering from ear troubles, or condemned for guiltiness or negligence, asserted by competent persons, or to whom it is proved, by opening an inquiry, deficient professional preparation, dishonesty, drunkenness, immorality, or other serious delinquencies.

CHAPTER V.

REPETITION COURSES AND REQUALIFYING FOR TITLES.

ART. 31.—Subject to the sanction of the Maritime Territory Director who forms part of the course for refreshing the knowledge of the students, the persons named in the preceding article, who should consider themselves going through a course of repetition, will be admitted to the operators school.

ART. 32.—The course of repetition may be composed of the following persons:—

(a) Retired operators from the Navy who apply to that effect.

(b) Mercantile operators who, having given up, temporarily, their profession, wish to renew their knowledge to return to it.

(c) All operators in active service who, having the necessary time to spare, so desire.

ART. 33.—The conditions for the repetition course will be the same as those set up in Chapter III of the present regulations for school members.

ART. 34.—Every operator wishing to requalify for the title, owing to its validity having expired, must pass in the same manner and under the same conditions as the school members, the examinations prescribed in the present regulations.

APPENDIX.

SYLLABUS OF ORAL AND WRITTEN EXAMINATIONS.

I.—ARITHMETIC.

First Period.

(a) The four simple rules, fractions and decimals.

(b) Problems in connection with the four simple rules.

(c) Weights and measures, metrical system.

(d) Problems on the metrical system.

2.—ALGEBRA.
First Period.

- (a) Elementary rudiments, notations, signs, negative quantities.
- (b) Addition, reduction of similar terms, negative quantities, unknown quantities.

3.—MORSE.

- (a) Characteristics and signs.
- (b) Practice in transmission and reception until at the end of the first period a speed of not less than 10 words per minute is reached, and at the end of the course, more than 12 words per minute. The number of words to be computed at the rate of five letters to a word.

To obtain the title of first class operator, the speed in transmitting and receiving must not be under 12 words per minute.

4.—ELECTRICITY.
First Period.

- (a) Static electricity. Electric charges. Electrical field. Conducting and insulating bodies. Unit of quantity of electricity; the Coulomb. Electric potential. Electrical capacity; the Farad. Electric condensers. Discharge of the condensers. Coupling of condensers.

- (b) Electrodynamic. Electric current. The ampere. Switches. Electrical resistance. The Ohm. Ohm's law. Simple problems of Ohm's law.

- (c) Electrical cells. Electrodes. Characteristics of cells. Coupling of cells. Polarisation of cells. Depolariser.

- (d) Electric accumulators. Electrodes, electrolyte. Process; its density. Modern accumulators. Charging and discharging process. Charge and discharge voltage. Capacity of an accumulator. Slight idea on the alkaline accumulator.

- (e) Magnetism. Magnets. Magnetical induction. Magnetic and diamagnetic bodies. Magnetic field. Magnet-making. Magnetic compass.

Second Period.

- (a) Electromagnetism. Diversion of the magnetic compass by electric current. Right-hand rule or amperes. Induction of solenoid coil. Electromagnet. Galvanometers. Amperemeters. Voltmeters.

- (b) Electromagnetic induction. Dynamos. Working of a dynamo. Inductors. Induction. Commutators and its brushes. Double and multipole dynamos. Series shunt and compound dynamos. Characteristic of dynamos. Sketch representing the dynamos. Installation of dynamos on board. Distribution board of the dynamos. Keys. Fuses. Lamps.

- (c) Electric motors. Working. Counter E.M.F. Starter and field regulators. Sketch. Series, shunt and compound motors. Care and handling of motors. Generating motor of a wireless station.

- (d) Working. Power. The watt: unit of power. The Joule; working unit. Horse power; unit of mechanical power.

- (e) Transformers. Fixed and rotating transformers. Rule of transformation. Ruhmkoff's coil. Electric bells. Telephones.

- (f) Inductance. Self-induction, or phenomena due to induction.

- (g) Alternators. Frequency of alternating current. Currents of low frequency, high frequency and oscillatory current. Resonance and its object.

- (k) Knowledge of electric conductors with and without insulation and their characteristics according to the S.W.G., and of the lead fuses in accordance with their diameter.

5.—RADIOTELEGRAPHY.
Second Period.

- (a) Condenser. Oscillating discharge of the condenser. Oscillating circuit. Oscillators used in radiotelegraphy.

- (b) Open oscillating circuit or aerial. Radiation and propagation of the electromagnetic wave into space. Velocity of the electromagnetic wave. Wavelength. Damp and continuous waves. Decrement allowed.

- (c) How the signals emitted by a transmitting station are received.

How the electromagnetic waves in the transmitting station are produced.

Wavelengths employed on steamer and coast stations.

Third Period.

- (a) Circuit and general working of a radiotelegraphic station.

- (b) Description of the continuous current circuit in the Valparaiso radiotelegraph station. Circuit of alternating current in the same station. Circuit of low frequency and high tension alternating current. Oscillating circuit and aerial circuit.

- (c) Reception circuit. Idea of the magnetic detector and multiple tuner. Crystal detectors, and crystals used. Modern receivers. Idea of amplifiers.

- (d) Handling and practical working of the transmitting and receiving apparatus.

- (e) Main difference with other types of wireless sets.

- (f) Preservation of the apparatus and testing.

- (g) Practice in the workshop.

- (h) Knowledge of the regulations.

REPUBLIC OF CHILE.

NATIONAL NAVY.

REGULATIONS FOR PRIVATE, AMATEUR AND PRACTICAL RADIOTELEGRAPH STATIONS.

D ART. 1.—In accordance with Art. 1 of the Regulations of the Radiotelegraphic Service of the Navy, approved by Supreme Decree No. 164, dated 28th February, 1921, the Government will grant permission for the installation of private radiotelegraphic stations, exclusively destined to studies and experiments, provided that the stipulations of the present Regulations are adhered to.

ART. 2.—The power of the station not to be greater than 50 watts, measured at the terminals of the generator.

When oscillation (transmitting) valve is employed the power can be reduced, according to the requirements of the Radiotelegraphic Service.

ART. 3.—Any system of transmitter can be used, except that of direct coupling from the aerial to the oscillator.

ART. 4.—The maximum height and length of the conductor of an aerial will be 30 metres.

When two or more conductors are used, the height and length will be limited to 20 metres.

The length of the aerial will be measured from the leading-in insulator to its extremity.

ART. 5.—The longest wavelength that can be used in the transmission will be 200 metres.

The coupling between the primary and secondary of the transmitters will be such, that the two waves produced by the aerial do not differ more than 10 per cent from the longest.

ART. 6.—The logarithmic decrement of the oscillation of the transmitting aerial must not be greater than 0.2.

ART. 7.—Private stations possessing transmitters, must not be set up nearer than three kilometres from the Government stations.

When a new Government station is established, licenses to amateurs having their transmitting installations within a radius of three kilometres from the new station, will be cancelled.

ART. 8.—The person who desires to install a private station, should apply to the Ministry of the Navy, requesting the corresponding license.

Such application will be handed to the Maritime Territory Director to be forwarded, and through the intermediary of the General Direction of the Navy, to the Ministry of the Navy.

In this application the person concerned will state, besides his name, his father and mother's surnames, nationality, age, profession, address, the locality in which he desires to instal his station, and a detailed description of the installation, showing specially the type, power, aerial and purpose of the installation.

ART. 9.—On the receipt of such application the Maritime Territory Director will, for its information, make sure of the following:—

(a) That the applicant has sufficient knowledge to handle his installation, and that he is capable of transmitting and receiving at least 10 words per minute.

(b) That the position proposed for the station complies with the requirements of the Regulations.

(c) That the system, power, aerial, etc., complies with the requirements laid down in the present Regulations.

(d) That the applicant is in the position to prove his identity by means of his identity certificate.

On registering this application it will also be designated with a corresponding number or mark.

ART. 10.—On the Minister of the Navy granting this license, the Maritime Territory Director will send it to the Maritime Authority nearest to the place of the installation, in order to be handed to the person concerned.

On the Maritime Authority handing the applicant the license, the former will urge him to declare when he will start and finish his installation.

The license will hold good for the term of five years, at the end of which the applicant, if he so desires, will apply for an extension for another similar period.

ART. 11.—On receipt of the license from the Maritime Authority the applicant must, under oath, undertake not to divulge the communications which he intercepts, and to use his installation solely for study and experiments, unless the empowered authority should urge him to disclose such communications as he intercepts, or to use the installation for other ends; or

that the communications intercepted are of such a nature as to justify their being communicated to some authority in order to avoid misfortunes or other evils; or in the case of news of general interest, such as press or others of the kind.

The Maritime Authority will take down this oath declaration in writing and send it on to the Maritime Territory Direction.

ART. 12.—Once the installation is completed the Maritime Authority will inspect it and make sure that it complies with the requirements herein laid down, and if so, will authorise the working of the station.

He will give an account of all this to the Maritime Territory Director.

ART. 13.—Once the amateur is authorised to work the installation, he must not make any modifications implying changes neither in the power nor in the system of emission, without previous authorisation from the Maritime Territory Director.

ART. 14.—The granted license only authorises its proprietor to operate with the transmitter of his installation.

ART. 15.—Private stations are subject to the inspections which may be ordered by the Maritime Territory Director.

ART. 16.—They are under the obligation of obeying the immediate orders issued by the stations of the Navy.

ART. 17.—All private stations are, as from the time they receive their license, subject to the International Regulations and those of the Navy, and to the subsequent measures which the Government at any time might deem desirable to dictate.

ART. 18.—In the event of any breach in the Regulations, the Maritime Territory Director might order the closing up of a private installation and take the necessary steps to carry this into effect.

In such cases the Maritime Territory Director will inform his superiors, so that the cancellation of the corresponding license may be granted by the Supreme Government.

ART. 19.—Concessions for the establishment of private stations will be considered as cancelled with the promulgation of the decrees ordering the partial or total mobilisation of either the Army or the Navy; in that event the Maritime Authorities who have issued the licenses for the installation, will proceed without further steps to dismantle those stations, the apparatus of which to be placed under their custody or, if necessary, requisitioned and note of the proceedings to be taken in writing.

ART. 20.—The term "radiotelegraphic station" used in the present regulations applies not only to the installations completed, but also to those exclusively designed for receiving and transmitting, whether for radiotelegraphy or radiotelephony.

CHINA

(See also Map Section)

Including • Manchuria, Tibet and Mongolia.

THE Republic of China comprises China Proper (eighteen provinces), Manchuria, Mongolia, Sinkiang, and Tibet. It lies between $18^{\circ} 13'$ and $56^{\circ} 40'$ N. latitude, and between $71^{\circ} 51'$ and $133^{\circ} 52'$ E. longitude. The total area of the eighteen provinces and four dependent territories is estimated at 3,913,560 square miles and a population of 320,650,000.

The Republic in its present form was established on October 10th, 1911. The constitution, drafted by the first Parliament, that met on April 8th, 1913, laid down the basis of government under which this great Republic is

now governed. The executive power is vested in a President; whilst the legislative authority is exercised by a National Congress, comprising a Senate and a House of Commons.

CONTROL.

Radiotelegraphy in China is owned and controlled by the Government, and its administration is regulated by the Department of Telegraphs, Ministry of Communications. The Ministry of War and the Ministry of Marine control the use of Radiotelegraphy in the Army and the Navy respectively.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Yeh Kun Cho	Minister of Communications	Peking, Chiaotungpu
Tsiang Tsen Yi	Director General (and Chief of the Department) of Telegraphs, Commissioner of Codification of Telegraphy and Telephony, Ministry of Communications	Peking, Chiaotungpu
Lin Tze Sue	Electrical Engineer, Chief of the Traffic Sub-Department, Department of Telegraphs	Peking, Chiaotungpu
Mr. A. H. Eriksen	Adviser and Foreign Chief Superintendent	Peking, Chiaotungpu
Mr. A. Jørgensen	Wireless Engineer and Instructor in Radiotelegraphy at the College of Post and Telegraphy	Peking, Chiaotungpu
Mr. S. T. Dockray	Wireless Engineer	Peking, Chiaotungpu
Admiral Sah Cheng Ping..	Minister of Navy	Peking, Naval Board
Sü Chen Peng	Vice-Minister of Navy	Peking, Naval Board
Chen En Tao	Chief of the Military Department, Naval Board	Peking, Naval Board
General Chin Yuen Peng..	Minister of War	Peking, Board of War
Loo Kai Pun	Vice-Minister of War	Peking, Board of War

ORGANISATION.

The coast and inland stations administered by the Ministry of Communications are ten in number, including those of Woosung, Canton, Foochow, Shanghai, Tsungming, Wuchang, Kalgan, and Peking, of which the last five are coast stations open for public service, while the remaining three are official stations. Three new stations of the Marconi type (25 kW.) are being erected at Kashgar, Tihwafu (Urumtsi), and Urga. One 50 kW. station and five 5 kW. stations will be erected in Yunnan Province. These stations will be of the Poulsen type.

A wireless telephonic service was opened between Peking and Tientsin on March 7th, 1922. It is claimed to be the longest line of its kind open to public use in the world. The equipment was supplied by the China Electric Company, and is manufactured exclusively by the International Western Electric Company (Inc.), New York. The system, as perfected in the Peking-Tientsin service, ensures transmission when connected with telephone central offices. The tests that were applied at the opening ceremony were entirely successful. The distance between Peking and Tientsin is 80 miles.

It has been proposed to erect several small stations of from 1½ to 5 kW. in Outer Mongolia and at some important points in Chihli Province.

The Naval Board has purchased a very large station of 500 kW. from a Japanese factory. The erection of this station was started in 1920.

A Radio Training Station was opened in Peking in 1913. It is controlled by the Ministry of Communications.

ADMINISTRATION.

At present radiotelegraphy in China awaits development and the laws and regulations affecting the subject consist, therefore, of those formulated to govern the working of the ordinary wired telegraph and telephone applied, as far as they are applicable, to radiotelegraphy. For this reason we present here a translation of the Chinese general regulations affecting all electrical means of communication, with a few comments emphasising the points which appear to affect wireless telegraphy, and also form of license for pilot boats.

A—Instructional Order No. 20.

B—Form of License for Pilot Boats.

INSTRUCTIONAL ORDER No. 20.

A Dated April 18th, in the fourth year of the Republic of China—i.e., 1915. REGULATIONS AFFECTING ELECTRICAL MEANS OF COMMUNICATION.

ART. 1.—All telegraphs and telephones, whether wired or wireless, shall be included in the term "Electrical means of Communication."

ART. 2.—All electrical means of communication shall be owned and controlled by the State.

ART. 3.—The following electrical means of communication may be set up by private individuals or corporations after the sanction of the Government has been obtained:

(a) Those established for the exclusive use of railways, mines, or other specific and commercial enterprises.

(b) Those which are set up by individuals or corporations or official departments on their premises for the purpose of establishing connection with a public telegraph office for the convenience of the transaction of the business carried on by the said individuals or corporations.

(c) Those which are used by individuals, corporations, or official departments for intercommunication between various parts of the building in which they are located.

(d) Those which are used by ships *in transitu*.

(e) Those which are set up for the purpose of experiment or research.

(f) Telephones whose calling powers are to be confined within a certain definite area. These must not, however, be erected in any area which is at present furnished with telephonic communication.

[This clause appears to be one intended to apply to future telephone installations and not to any which may be at present erected. Of the above items it will be noted only (d) and (e) can apply to wireless telegraphy.]

ART. 4.—The Government, in case of necessity, may, in accordance with the provision of Laws and Edicts, seize all private electrical means of communication and convert them to public or military use. When, under the provision of this regulation, the Government so seize and make use of private owned electrical means of communication, it may appoint officials to take charge of and work them.

ART. 5.—When the Government consider it necessary in the interests and for the maintenance of public safety, they can restrict, suspend or cancel any use of electrical means of communication within certain prescribed areas.

ART. 6.—The Superintendent officials at telegraph offices controlled by the Government may suspend the transmission of any message or refuse altogether to accept it, when they consider its contents to be opposed to public safety.

ART. 7.—When special circumstances or *force majeure* cause telegrams to be delayed in transmission or prevent their transmission, the senders cannot claim compensation for damage arising from such delay or hindrance.

ART. 8.—Correspondents are themselves responsible for the contents of their messages.

ART. 9.—With regard to the transmission of telegrams or telephone messages no exemption with regard to liability or responsibility can be entertained on the ground of mental deficiency on the part of the sender.

ART. 10.—Telegrams received at public telegraph offices—other than those specified by Government orders—will be delivered in accordance with the addresses given by the sender. If, owing to the fact that the address given is incorrect or insufficient, the telegram cannot be delivered, this fact will be publicly announced, and if no application for the message is received within forty-two days from the date of the public announcement, the said message will be destroyed.

ART. 11.—When messages are received in secret code, or in obscure or metaphorical language, the telegraph officials may, if they think fit, call upon the sender to translate the code or elucidate the meaning of the message. If the sender refuses to decode or explain, or, in complying with this request, fail to put the telegraph official truthfully in possession of the real meaning of the message, the official may stop the transmission of the said message.

ART. 12.—Officials, workmen, or messengers engaged in the performance of their duty in connection with telegraphs or telephones are not to be interfered with or stopped by the authorities of the customs or by those operating the canal locks.

ART. 13.—Officials, workmen, or messengers when proceeding in discharge of their official functions are to be allowed unhindered transit over building land and fields (with the exception of those enclosed by walls and gateways) whenever there may be any hindrance to their transit through the regular streets or paths. But if the passage of such officials, workmen, or messengers causes damage to be done to buildings, or to crops in cultivated property, the Government will pay adequate compensation on the application of the owner and on his proof of such damage.

ART. 14.—When officials, workmen or messengers engaged in performing their official functions ask for help or assistance in order to overcome any special hindrance in transit, or when they ask for assistance in climbing mountains or crossing rivers, the persons to whom such request is made may not refuse such help or assistance without assigning adequate reason for so doing. But in the event of such assistance being rendered, the Government will give the person rendering it fit and proper remuneration for such aid and assistance, on his application for such remuneration.

ART. 15.—Telegraph or telephone wires may be set up at convenient places, no matter through what property it is necessary for them to pass; but if their erection involves an encroachment on the rights of others, whether private individuals or corporations, the Government will on application, allot adequate compensation for such encroachment.

ART. 16.—Charges for telegrams and telephone messages shall be collected in cash according to fixed rates.

ART. 17.—Materials used for the purposes of Telegraph and Telephone Services shall be exempted from tax, but not from Customs Duties.

ART. 18.—With reference to the compensation for damage caused, and the right of application for remuneration referred to in the above clauses in connection with the carrying out of Electrical Means of Communication, the period within which such right to compensation or remuneration may be dealt with, and the manner in which it may be so dealt with and adjudicated, shall be regulated by separate "Instructional Orders."

ART. 19.—Any who may offend against Articles 2, 3, 4, 12, 13, and 14, shall be liable to a fine of from 5 to 200 dollars. Those who offend against Articles 2 and 3 shall, in addition to fines, be liable to confiscation of poles, wires, machines or other apparatus.

ART. 20.—The conditions laid down in Articles 12-19 shall not be applicable to private electrical means of communication, but the specially authorised telephones erected under section (f) or Article 3 may adopt the regulation comprised in Article 16.

ART. 21.—All Laws, Orders or Treaties affecting telegrams between China and Foreign Countries shall have their respective provisions observed and the provisions of this Instructional Order shall not be held to modify or abrogate them.

ART. 22.—These regulations shall come into force immediately on the date of their promulgation.

FORM OF LICENSE FOR PILOT BOATS IN CHINESE WATERS.

B The (hereinafter called "the licensee") is hereby granted license to operate within the pilot district of the wireless telegraph system installed on board the Pilot Boat, as specified in the schedule hereto for the period commencing the and terminating on the, on payment of the sum of ten Mexican dollars, being the license fee for the privilege above named.

This license is subject to the following terms, conditions and restrictions :—

1. The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

2. The range of signalling shall at no time exceed one hundred nautical miles.

3. The licensee shall use the licensed apparatus solely for the purpose of exchanging with ships at sea messages relating to the safe and prompt working of the licensee's pilot service, and for making or answering calls of distress. However messages originating or terminating on board the aforesaid pilot boat may be exchanged with the Chinese wireless coast stations at on payment of the ordinary charges accruing to the Chinese Telegraph Administration for wireless messages exchanged by means of the said stations. Payment of such charges shall be made in such manner as the Ministry of Communications shall direct.

4. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the transmission or receipt of messages, except messages authorised under paragraph three.

5. All telegrams exchanged by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose. Such registers as well as the licensed apparatus shall be open to inspection by thereto authorised officers of the Chinese Telegraph Administration.

6. The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Ministry of Communications.

7. The licensee shall observe the provisions of the International Radiotelegraphic Service Regulations of 1912, as regards transmission

of messages (Article XX—Article XXXIV) in so far as they are not inconsistent with the rights and privileges granted by these presents.

8. The licensee shall so operate the licensed apparatus so as not to interfere with :—

(a) Naval signalling by means of any system of wireless telegraphy between two or more ships of the Chinese Navy or between a ship of the Chinese Navy and any other wireless station, whether on shore or on any ship ;

(b) The working of any wireless telegraph station lawfully established, installed, or worked in China or the territorial waters thereof, and in particular the licensed apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations on ships at sea.

9. The licensee shall not work or use the licensed apparatus whilst the boat is in the harbour of, except with the special permission in writing of the Ministry of Communications.

10. Regulations 8 and 9 shall, however, not apply to the use of the licensed apparatus for the purpose of making or answering signals of distress.

11. The licensed apparatus shall not, without the consent in writing of the Ministry of Communications, be altered or modified in respect of any particulars mentioned in the schedule hereto.

12. The licensee, in case the aforesaid pilot boat be sold or dispensed with and remain in Chinese waters, shall remove the wireless apparatus before transfer of ownership takes place.

13. The licensee shall operate the licensed apparatus only during the hours indicated on the schedule hereto, except for the purpose of making or answering signals of distress.

14. The licensee shall at all times indemnify the Ministry of Communications against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

15. If, and whenever, in the opinion of the Ministry of Communications, the interests of the Government of China demand that the use of the licensed apparatus shall be prohibited or shall be under full control of the said Government, the licensee shall conform to all directions prescribed by the Ministry of Communications.

16. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, the licensee shall be liable for every such breach, non-observance or non-performance to a penalty of one hundred Mexican dollars, and in every such case the Ministry of Communication may, by writing, revoke and determine these presents, and the license herein granted shall become null and void.

17. This license or a confirmed duplicate of it shall always be carried on board the aforesaid Pilot Boat.

The Schedule of ship Stations before referred to :—

1. Name of ship on which station established.
2. Nationality.
3. Call signal.

4. Normal range of signalling in nautical miles :—

- (a) by day;
- (b) by night.

5. Character apparatus :—

- (a) Radiotelegraph system with the characteristics of the system of emission;
- (b) Wavelengths in metres (the normal wavelength to be underlined).

6. Hours of service.

7. Power :—

- (a) Source and maximum output
- (b) Maximum antenna energy.

8. Alternator :—

Number of cycles per second.

COCOS—KEELING ISLANDS

(See under STRAITS SETTLEMENTS)

COLOMBIA

(See also Map Section)

THE Republic of Colombia lies between latitude $2^{\circ} 40' S.$ and $12^{\circ} 25' N.$, its longitude extending from $68^{\circ} 0' W.$ to $79^{\circ} 0' W.$ Its superficial area is estimated at 440,846 square miles, its population at 5,855,077. The country is intersected by three great ranges of the Andes Mountains known as the Western, Central, and Eastern Cordilleras, the latter of which is the more important as it affords a series of vast table-lands, cool and healthy.

CONTROL.

Control of radiotelegraphy in Colombia is vested in the Minister of the Interior, who is ultimately responsible, whilst the executive authority is wielded by the Director of Posts and Telegraphs.

ORGANISATION.

The station of Santa Marta was the first wireless installation in the Republic, that of Cartagena being next in order. There are six new stations under construction.

ADMINISTRATION.

No special regulations have been issued through the medium of wireless legislation, but in accordance with the current Colombian laws wireless as well as wired telegraphy constitutes a public Service under State control in every way. The Government does, however, grant permission for contracts, under which radiotelegraphic service may be instituted by private companies. The United Fruit Company owns and works the station of Santa Marta, which was put into operation in 1912, and the Telefunken Company owns and works the station of Cartagena. Marconi's Wireless Telegraph Co. own and work the station of Puerto Colombia and have under construction an international station at Bogota. The station of San Andres, which is owned by the Government, was constructed by the Telefunken Co., but later refitted by Marconi's Wireless Telegraph Co., by whom it is operated on behalf of the Government.

The Government of Colombia have contracted with Marconi's Wireless Telegraph Co. for the erection of five new stations, four of which will be completed almost immediately. These will be managed and administered by the company by virtue of an arrangement with the Colombian Government.

In March, 1922, the Government of Columbia appointed a Commission to formulate Laws and Regulations which are to be submitted to the House for discussion and enactment.

COSTA RICA

(See also Map Section)

THE smallest of the Central American Republics, its territory lies between the independent Republic of Panama on the east and that of Nicaragua on the north. In area it covers about 23,000 square miles, and possesses approximately 468,373 inhabitants.

CONTROL AND ORGANISATION.

The control of wireless telegraphy and telephony is a State monopoly.

In 1904 the United Fruit Co. established Radiotelegraphic stations at Port Limon, to correspond with Bocas de Toro, replacing the latter station in 1921 by Almirante, in Panama, where the Company had established its Divisional Headquarters.

On July 25th, 1921, a contract was signed between the Government and Messrs. R. Pacheco Lara and J. J. Carranza Volio, two Costa Rican electrical engineers, for the construction, maintenance and management of

(a) An International radiotelegraphic station of at least 10 kw.

(b) Other radiotelegraphic stations of sufficient power for inter-communication.

This contract is to last for 25 years, subject to a prorogation for a further 20 years according to the judgment of the Government. In the event of the prorogation not being granted, the Government has the option to purchase, but if the prorogation is granted the whole of the plant in perfect condition becomes the property of the State at the end of 45 years.

These stations are destined for public correspondence.

At present there is but one wireless station situated at Limon, the Atlantic port of the capital, San José. It is open for public correspondence with ships.

ADMINISTRATION.

Wireless telegraphy is the subject of Laws and Regulations, of which we have only been able to obtain the following :—

A—Decree 34 of 10th April, 1920.

B—Decree 20 of 3rd August, 1921.

C—Decree 25 of June, 1922.

A. WITH REGARD TO THE RADIOTELE-
GRAPHIC STATIONS IN COSTA RICA.

No. 34.

FRANCISCO AGUILAR BARQUERO

Provisional President of the Republic of Costa Rica.
DECREES.

ART. 1.—The wireless telegraph and telephone which are services of public utility, are declared to be the monopolies of the State. The concession and rights for their exploitation can only be obtained for a limited period and by means of a contract which necessitates the approval of the legislative authority for its validity.

ART. 2.—There can be no question of concession regarding the right, which the State reserves to itself in perpetuity, to establish radiographic stations in the territory of the Republic for military purposes, and for the transmission and reception of official messages.

ART. 3.—The executive authority, in accordance with the regulations which it prescribes, shall be able to authorise the amateurs and the institutions for instruction to install radiographic apparatus for experimental purposes, it being always understood that they should not violate the secrets of the correspondence of the wireless communications, disturb their working, nor use their apparatus for commercial purposes.

ART. 4.—The foundation, handling and exploitation of the wireless telegraphy and telephone establishments for international service can only be permitted to natives of Costa Rica, singly or in co-operation, under the superintendence and protection of the State. The concession thus obtained, and the establishment and the capital which arise from it, shall be unattachable, and shall not be able to be violated in any case, nor for any reason, without the previous consent of the Constitutional Congress.

ART. 5.—The permission conceded for such wireless stations as are already established in the country can be revoked at any time, and their respective plants pass to power of the State against the corresponding indemnity.

Given at this presidential house, San José, on the Tenth day of the month of April, of One thousand nine hundred and twenty.

FRANCISCO AGUILAR BARQUERO.

The Secretary of State for Foreign Affairs and Offices appertaining thereto.

ANDRES VENEGAS.

The Secretary of State for the Interior and the Police.

CARLOS M. JIMENEZ.

The Secretary of State for the Treasury and Commerce.

CARLOS BRENES.

The Secretary of State for Public Works, etc.

P. PEREZ ZELEDON.

The Secretary of State for Public Instruction.

J. GARCIA MONGE.

The Secretary of State for War and the Navy.

AQUILES BONILLA G.

OFFICIAL SECTION.

LEGISLATIVE BODY.

No. 25.

THE CONSTITUTIONAL CONGRESS OF
THE REPUBLIC OF COSTA RICA

B

ORDERS

ART. 1.—That authorisation be given to Messrs. Ricardo Pacheco and José Joaquín Carranza, engineers, to form a limited liability company, which shall be called *Compañía Radiográfica Internacional de Costa Rica*, which will exploit the concession granted to them by Order No. 47 of the 25th of July, 1921, and will assume all the obligations of the concessionaries.

ART. 2.—The company, which is formed with this object, will be by registered shares, which can only be subscribed for and transferred by and to subjects of Costa Rica, who must be subject to all laws and regulations as per order No. 34 of the 10th of April, 1920.

Communicated to the executive body.

Given in the Sessions Hall of the Congress—National Palace—San José, on the 23rd day of the month of June, of the year 1922.

ARTURO VOLIO, President.

JORGE ORTIZ E., First Secretary.

NAUILLIO ACOSTA, Under Secretary.

President's House, San José, on the 24th day of the month of June, of the year 1922.

Executed, Julio Acosta, Secretary of State for Public Works.

NARCISO BLANCO,

No. 20.

JULIO ACOSTA GARCIA,
Constitutional President of the Republic of Costa Rica,

ORDERS

C The following regulations for wireless installations.

ART. 1.—Radiotelegraphic and radiotelephonic stations belonging to amateurs and instruction institutes may only work when they have obtained a written permit from the Minister of the Interior, which may be cancelled whenever it is deemed necessary. Said stations will not use a longer transmission wave than 200 metres, nor a transformer which exceeds 1 kilowatt, and cannot use a valve of more than 5 watts except by special authorisation of the legislative body, according to Decree No. 34 above quoted.

ART. 2.—If in the above-mentioned stations the transmitter is of such a nature that it radiates power in two or more wavelengths, more or less defined in accordance with a sensitive wave, the power of the shorter waves must not exceed the power of the longer by more than 10 per cent.

ART. 3.—The logarithmic decrement by complete oscillation in the series of oscillations emitted by the transmitter of the stations referred to, shall not exceed two-tenths.

ART. 4.—No person or persons holding stations or cognisant of the handling of such, before mentioned, shall divulge or make public the contents of any message whatsoever they may receive. All such as are deemed culpable of divulging or making public any message shall be fined the sum of 250 colons or be imprisoned for three months, or both if it should be so decided. In case of this offence occurring, he who is guilty of it shall be exposed to the cancellation of the license conceded, and to the confiscation of all the apparatus in use at the station. There will be, moreover, in such punishment as is incurred by those who violate the correspondence, everything in accordance with the laws of the country.

ART. 5.—All station apparatus described in Art. No. 1 of this order shall be sealed by the Inspector of Communications, and if at any of his visits to said stations he should find any seal broken or replaced, he shall expose the guilty party to confiscation of his installation and apparatus, and the cancellation of his license.

ART. 6.—The official establishments for tuition, once their license obtained, may make such experiments as will serve for tutorial purposes, always refraining from disturbing or causing interference to the international office or to others which are authorised by the Government.

Given in the House of the President on this the 3rd day of August, One thousand nine hundred and twenty-one.

JULIO ACOSTA.

The Secretary of State for the Interior,

AQUILES ACOSTA.

CUBA

(See also Map Section)

THE largest of the islands in the Caribbean Sea, the territory of Cuba occupies an area of about 44,215 square miles, and has a population of 2,889,004. The country was in Spanish occupation from its discovery until the signature of the Paris Treaty in December, 1898, when it assumed independence, and is under the government of a President.

CONTROL.

The radiotelegraph service in Cuba is controlled by the Government and is carried on under the direction of the Department of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sr. Mignel Paniagua	Director-General of the Department of Communications	Havana
Sr. Carlos Barnet	Sub-Director of the Department of Communications	Havana
Sr. Pedro Pablo Torres	Chief of the Division of Technical Inspection	Havana

ORGANISATION.

The radiotelegraph service of Cuba was inaugurated in the year 1906 by the establishment of two small stations installed at the landing places of Mariel and Nueva Gerona, on the Island of Pinos, the said stations being assigned to the handling of internal correspondence.

In 1909 the station of Mariel was abolished and the service extended by the installation of four new stations distributed amongst the ports of Havana, Santiago de Cuba, and the towns of Santa Clara and Camaguey. The four stations were instituted for the rendering of a public service, in general, and they filled a great want in view of the large number of vessels navigating the territorial waters of the Island.

Following the dictates of experience, the stations of Santiago de Cuba and Camaguey were removed to the coast towns of Chaparra and Baracoa, and a new station was established in the town of Pinar del Rio.

The Cape San Antonio radio station, belonging to the United Fruit Co., was erected in 1909 and equipped with Fessenden apparatus. In 1909 this station was partly blown down and on being rebuilt, was again seriously damaged by a hurricane. Following this, it was again rebuilt and finally completely demolished by a hurricane. This station was, therefore, removed inland to a more sheltered position.

At present seven coast stations exist, all of which are open for public correspondence with ships.

As experimental stations worthy of mention may be cited that of the Colegio Francés (French College) of Cienfuegos, and that of de Belén, of Havana, the latter being assigned to the reception of meteorological signals.

In addition to the coast stations shown in the foregoing statement, the Cuban Government has under its jurisdiction over twenty ship stations installed on vessels of the Navy and merchant vessels belonging to private companies.

ADMINISTRATION.

The Cuban Administration adhered to the Radiotelegraph Convention of London in January, 1918; but owing to reasons that are irrelevant here, this adherence was not formalised until February, 1920. For this reason the administrative side of the radiotelegraph service is actually in process of organisation and the laws and regulations by which it will be governed are being studied. It is hoped to include their text in our next edition.

CURAÇAO

(See under DUTCH WEST INDIES).

CYPRUS

(See also Map Section)

THIS island was annexed by Great Britain on November 5th, 1914. At its shortest distance (to Asia Minor) it lies 30 miles from the mainland, whilst 50 miles separate it from the nearest point on the Syrian coast. In area it covers 3,584 square miles and has a population of 274,108. The government of the island is administered by a High Commissioner (appointed by Great Britain) with the advice and consent of the Legislative Council.

CONTROL.

There are at present no wireless stations on the island and consequently no organisation is in existence.

ADMINISTRATION.

The following Act provides for the regulation of wireless telegraphy in Cyprus:—

A—Wireless Telegraphy Law, 1913.

B—A Law to make further Provision with respect to Wireless Telegraphy on Ships.

A Law enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to provide for the Regulation of Wireless Telegraphy.

A Be it enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Law may be cited as the Wireless Telegraphy Law, 1913.

2. In this Law:—

“Wireless telegraphy” means any system of transmitting messages or other communications by means of electric galvanic or magnetic signals without the aid of any wire connecting the points from and at which the messages or other communications are sent and received, and includes any apparatus for transmitting or receiving such messages or other communications.

Provided that nothing in this Law shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The High Commissioner in Council may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus.

4. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus except under and in accordance with a license granted in that behalf by the High Commissioner.

(2) Every such license shall be in such form and for such period as the High Commissioner in Council may determine and shall contain such terms conditions and restrictions on and subject to which the license is granted as the High Commissioner in Council shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license but no proceedings shall be taken against any person under this Law except with the previous sanction of the King's Advocate.

(2) If a judge of a District Court or of the Supreme Court is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant authorising the person to whom it is addressed to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The High Commissioner in Council may make regulations for all or any of the following matters:—

(a) for prescribing the form and manner in which applications for licenses under this Law are to be made;

(b) for prescribing the fees payable on the grant of any license;

(c) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship of any nationality in the waters of Cyprus shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established installed or worked in Cyprus or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) for prohibiting except with the special or general permission of the Island Postmaster the working or using of any apparatus for wireless telegraphy on board a merchant ship of any nationality whilst such ship is in any of the harbours of Cyprus;

(e) for prohibiting or regulating in case at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships of any nationality in the waters of Cyprus the use of wireless telegraphy on board such ships while in such waters by such further rules as the High Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs

(c), (d) and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the High Commissioner in Council that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms conditions and restrictions as the High Commissioner in Council may think proper but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Law or of any Regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Law and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine not exceeding fifty pounds.

(2) All convictions forfeitures and fines under this Law or any Regulations made thereunder may be had and recovered before a District Court.

9. This Law shall come into operation on the 1st day of July, 1913.

Passed in Council the twenty-third day of May, in the year of Our Lord one thousand nine hundred and thirteen.

No. XII, 1922.

A Law enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to make further provision with respect to Wireless Telegraphy on Ships.

MALCOLM STEVENSON.

March 15th, 1922.

Be it enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows :—

SHORT TITLE.

1. This law may be cited as the Merchant Shipping (Wireless Telegraphy) Law, 1922, and shall be construed as one with the Merchant Shipping Acts, 1894 to 1916, so far as the same shall be applicable or shall be made applicable to Cyprus.

INTERPRETATION.

2. For the purpose of this Law :—

“ Passenger steamer ” means a steamer which carries more than twelve passengers.

“ Wireless telegraphy inspector ” means an officer appointed by the High Commissioner under the provisions of this Law.

WIRELESS TELEGRAPHY INSPECTORS.

3. The High Commissioner may appoint officers as wireless telegraphy inspectors, who shall have the same duties and powers as if they had been appointed wireless telegraphy inspectors under the Merchant Shipping (Convention) Act, 1914.

WIRELESS TELEGRAPHY REQUIREMENTS.

4. (1) Every seagoing British ship registered in Cyprus being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Law, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules :

Provided that the High Commissioner in Council may exempt from the obligations imposed by this Law any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The High Commissioner in Council shall make rules prescribing the nature of the wireless telegraph installation to be provided of the services to be maintained, and the number, grade and qualifications of operators and watchers to be carried :

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Law, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the High Commissioner in Council to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Law.

5. The obligations imposed by this Law shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by or under the Wireless Telegraphy Act, 1904, the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus, or the Wireless Telegraphy Law, 1913.

APPLICATION TO SHIPS NOT REGISTERED IN CYPRUS.

5. The foregoing provisions of this Law shall, as from a date three months after the coming into operation of the obligations imposed by this Law on British ships registered in Cyprus, apply to ships other than British ships registered in Cyprus while they are within any port in Cyprus in like manner as they apply to British ships so registered.

DATE OF COMING INTO OPERATION.

6. This Law shall come into operation on a date to be fixed by the High Commissioner by notice in the *Cyprus Gazette*.

Passed in Council the thirteenth day of March, in the year of Our Lord one thousand nine hundred and twenty-two.

THALES CABABE,
Clerk of Council.

CYRENAICA

(See under TRIPOLITANIA).

CZECHOSLOVAKIA

(See also Map Section)

THE Czechoslovak Republic, situated geographically nearly at the centre of Europe, is actually the old Kingdom of Bohemia, with some additional provinces. It has an area of 54,264 square miles and a population of 13,595,816.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Alois Tueny	Minister of Posts and Telegraphs	Prague
Dr. Maximilian Fatka ..	Director-General of Posts and Telegraphs ..	Prague
Mr. Emil Breicha	Vice do.	Prague
Mr. Augustus Sandor ..	Engineer, Chief of the Technical Section ..	Prague
Mr. Josef Strnad	Head of Radiotelegraphic Department ..	Prague

CONTROL.

The control of wireless telegraphy and telephony is in the hands of the Ministry of Posts and Telegraphs, a special Department regulating the organisation, construction and experimental work in wireless. No licenses are issued.

ORGANISATION.

The advantageous geographical situation of Czechoslovakia, with its capital, Prague, in the very heart of Europe, makes it a virtual centre for all kinds of communication. The most important railway and aerial routes connecting Western Europe with the East, and the North with the South, already pass through Prague, and the Czechoslovak Ministry of Posts and Telegraphs is endeavouring to bring about similar conditions in radio-telegraphy.

With the utmost despatch a transmitting station is being erected near Prague, at Pobebrady. It will be operated from the main office at Prague by means of a relay. The station will be of the high frequency alternator type, with 50 kW. in the aerial. It is intended for European International wireless service, and will be augmented at a later date by the addition of a second 50 kW. high frequency alternator, the combination giving altogether 100 kW. in the aerial, when it will be used for trans-continental communication. Until this station has been completed, transatlantic correspondence will be transmitted *via* the new French station at Sainte Assize, near Paris, by agreement with the Societe Francaise Radio-Electrique.

In addition to this, a 5 kW. valve reserve plant is being installed at Pobebrady, and the following other stations are also being built: at Carlsbad (Karlovy Vary), the well-known Bohemian watering place, at Moravska Ostrava, an important industrial centre in Moravia, at Bratislava (the Czechoslovak Danubian port in Eastern Slovakia), and at Uzhorod (Carpathian Ruthenia). The station at Bratislava will be used not only for inter-communication, but also for messages relating to the international navigation on the Danube, and Central European aviation. A special station for the air service is being erected at Kbely, near Prague, where the main aerodrome in Czechoslovakia is situated.

During 1921 two stations were completed. A 5 kW. station at Brno (Brunn), in Moravia, and a 250 kW. station at Prague-Kr. Vinohrady. The Brno station is now being used for communication with Rome, and the Ministry of Posts and Telegraphs is negotiating with the Governments of several other European States with a view to extending the service. The station at Prague-Kr. Vinohrady is being used for meteorological purposes in connection with the air service between Paris-Prague-Warsaw.

All radio stations will also be adequately equipped for the purposes of wireless telephone, and most of the stations will send out meteorological reports.

ADMINISTRATION.

New regulations with regard to wireless telegraphy and telephony are under consideration and will be submitted to the National Assembly as soon as the principal features of the future international agreement will be known.

DANZIG (FREE TOWN OF)

(See also Map Section)

BY the Treaty of Versailles, Danzig became a free town, placed under the protection of the League of Nations. It has an area of 709 square miles and a population of 351,380.

CONTROL.

The administrative service for wireless telegraphy and telephony is exercised by the Administration of Posts and Telegraphs for the district of the free city of Danzig. Wireless telegraphy and telephony are under the direction of the Danzig Telegraph Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Councillor Zander ..	Director of Post and Telegraph Administration ..	Danzig
Head Postmaster ..	Director of the Telegraph Office at Danzig ..	Danzig

ORGANISATION.

Both State and privately owned stations exist in Danzig. In course of the year 1922 a new coast station will be erected in Danzig and the present station will probably be used as an inland wireless station later. The receiving station of the future inland wireless station and the receiving station for home and press news will be removed to Danzig-Langfuhr, when the new wireless coast station is ready.

ADMINISTRATION.

For wireless traffic the following rules and regulations, etc., are in force here :—

A—The International Wireless Telegraphy Agreement.

B—The Law relating to Telegraphy in the German State of 6th April, 1892.

C—The German Law of the 7th March, 1908, concerning the alteration of the law relating to Telegraphy in Germany of the 6th April, 1892.

D—The German regulations concerning the working of Telegraph installations on foreign ships on the German high seas of 12th December, 1909.

E—The direction for wireless telegraphy service for Germany of 15th of June.

F—The German telegraph regulation of the 16th June, 1904.

The rules and regulations relating to wireless telegraphy and telephony are not to hand for the year 1923.

DENMARK

(See also Map Section)

Including : Farøe Islands.

THE territory ruled by King Christian X includes the peninsula of Jutland and several islands in the Baltic Sea, the most important of which are Sealand and Funen; also the Farøe Islands (north of the Shetlands) and Greenland. The Government is what is called a Parliamentary Government, the executive power being vested in the Sovereign (acting through his Ministers), assisted by the Cabinet consisting of twelve Secretaries of State, whose power rests upon the possession of a majority in the Lower House (Folketinget). It has an area of 16,609 square miles, and a population of 3,289,195.

CONTROL.

Wireless Telegraphy is naturally of considerable importance to a maritime nation like that of the Danes, whose fatherland is at no point any great distance from the sea. It is a Government monopoly, and the administration is supervised by the Minister of Public Works.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. M. Slebsager	Minister of Ways and Communications.	Copenhagen
Mr. N. Meyer	Director of Telegraphs	Do.
Mr. W. Thomsen	Engineer in Chief of the Telegraph Department.	Do.
Mr. W. Bjarnov	Chief Engineer, Inspector of Wireless Installations and Instruction.	Do.
Mr. H. Schledermann ..	Electrical Engineer in Chief, Royal Danish Navy, Inspector of Wireless Installations and Instruction.	Do.

ORGANISATION.

Originally radiotelegraphy was adopted in Denmark by the Lighting Department (1901) and by the Royal Navy (1902), but later on the commercial use of radiotelegraphy was organised under the supervision of the Telegraph Department and the State Railway Department (both acting under the jurisdiction of the Department of Public Works); the Naval Department and the Lighting Department (both under the Admiralty), and the War Office. These various departments exercise jurisdiction independently over their own radiotelegraphic section.

The first stations erected were those at Blaavandshuk (lighthouse) and on board the Horns Rev (lightship), both of them dating from 1901. The latest available statistics enumerate:—

LAND STATIONS.

- Seventeen directly controlled by Government (two of them situated in the Farøe Islands).
- One experimental station (Lyngby Radio), belonging to the Telegraph Department (not included under (a)).
- Two instructional stations (Svendborg Radio), with corresponding station Jylland (frigate).

SHIP STATIONS.

- Three hundred and sixty-three with lower power.
- Seventy-five Government vessels.
- Two hundred and eighty-eight private vessels.

No forms of license for radiotelegraphic working have been issued. The regulations for the erection and operation of private wireless stations are under revision, but it is not yet possible to give details. Laws regarding wireless in its application to aviation are also projected, but so far have not eventuated. The Danish Government contemplates the purchase of a high power station for transatlantic service.

There is no arrangement for the transmission of time signals, but the Lyngby Radio station broadcasts a press message at 1100 G.M.T. on 4,650 metres wavelength, and meteorological reports at 0735, 1335 and 1835 G.M.T. on 3,650 metres wavelength.

A meteorological report as to the atmospheric conditions in the Danish waters is, on demand, sent to ship stations from the coast stations—Copenhagen Radio and Blaavand Radio—against payment of one franc. When ice-service is ordered during the winter season, ice reports are broadcasted on 600 metres wavelength at 1100 and 2100 G.M.T. from the Copenhagen Radio station, and at 1120 and 2120 G.M.T. from Blaavand Radio.

Radiotelephonic communication between the Island of Bornholm and the rest of Denmark will be completed in the near future.

ADMINISTRATION

The first Act to regulate radiotelegraphy in Denmark was passed in 1907 (Act No. 99 of April 19th). New regulations became effective on July 1st, 1913. Both are reprinted below.

A—Act 99 of 1907.

B—Rules dated July, 1913.

C—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams. (See Norway.)

A The regulations affecting Wireless Telegraphy in Denmark are based upon:

ACT No. 99 OF APRIL 19TH, 1907.

1. The Government shall have the sole right to erect and operate wireless telegraphs (radiotelegraphs) within the Danish boundaries and maritime territory.

2. Telegraph stations on board ships under foreign flag must only be utilised on Danish maritime territory when following the regulations to be drawn up in this respect by the Minister for Public Works. The Minister may prohibit every kind of telegraphic communication from such stations and take the necessary measures to carry through such prohibition, when in his opinion circumstances require it.

3. On board ships under Danish flag, not owned by the Government, telegraphic stations must only be fitted and operated both on and outside Danish maritime territory according to license previously obtained from the Minister of Public Works. In case the conditions concerning the fitting and working of the station stipulated in the license are not maintained, the Minister may cancel the license.

In case it is desired that the working of stations being in operation at the time when the Act comes into force, should be continued, an application to that effect must be filed with the Minister for Public Works not later than four weeks after the Act has come into force, the Minister having then to decide whether and on what conditions the operation of the station may be continued.

4. Scientific and technical trials with wireless telegraphy must be made by no others than the State Authorities unless permission to that effect has been previously obtained from the Minister for Public Works.

5. The regulations stipulated in Act No. 84 of May 11th, 1897, Art. 17, concerning the duty as to secrecy incumbent on the officers and functionaries of the Telegraph Department and concerning the punishment they may be subjected to in the case of a breach of the aforesaid duty, should also be applicable to wireless operators. The regulations stipulate in Art. 18 of the same Act concerning corresponding regulations for employers of private companies may also be made applicable towards operators on board ships.

6. Any contravention of the regulations given in Articles 1—4 shall be punished, provided that the circumstances concerned according to their nature do not inflict a more serious punishment, with forfeiture of the apparatus unlawfully placed and utilised. Furthermore, the contravening person may be liable to a fine of up to 400 kroner, which fine shall devolve to the Treasury. Such

contraventions shall be dealt with in the same way as public police cases. The Minister for Public Works shall be the only person entitled to institute proceedings against contraveners of this Act.

REGULATIONS.

B MADE EFFECTIVE ON JULY 1ST, 1913. In accordance with Act No. 99 of April 19th, 1907, concerning wireless telegraphs (radiotelegraphs) and the International Convention concerning radiotelegraphs drawn up in London on July 5th, 1912, supplemented by appendix decisions, finishing protocol and service regulations, the following decisions shall be observed in founding and working of radiotelegraph stations and in the handling of radiotelegrams:

I—ESTABLISHING OF RADIOTELEGRAPH STATIONS.

1. On Danish soil and on board ships permanently anchored such as lightships, etc., radiotelegraph stations (coast stations) can only be established by the Government.

2. On board ships under Danish flag, not owned by the Government, radiotelegraph stations (ship stations) may only be established and operated after permission has been previously obtained from the Department of Public Works.

The license or a certified duplicate of it must always be kept on board the ship.

The license may be withdrawn if the conditions for the fitting and operation of the station set out therein are not complied with; in such cases the entire apparatus belonging to the station must be removed.

3. Applications for licenses to establish and operate radiotelegraph stations on board ships sailing under the Danish flag must be drawn up on forms approved of by the Department of Public Works, delivered and sent in duplicate to the Telegraph Department, and must be supplied with an endorsement to the effect that the station will fulfil the following conditions:

(a) The waves transmitted must be as pure and as little damped as possible; the utilisation of transmitting apparatus, by which the transmitted waves are generated by a direct sparking discharge in the antenna, especially, is only permissible in case of need. This latter arrangement of the transmitter may, however, be permitted in the case of certain special stations (as, for instance, on board small vessels), the primary energy of which does not exceed 50 watt.

(b) The speed of transmission and reception must be no less than twenty words a minute, the word to consist of five letters. New installations utilising an energy of

more than 50 watt must be fitted in such a way as to make it easy to obtain more telegraph distances, smaller than the normal ones, the smallest of which should be about 15 nautical miles (equal about 28 km.). Old installations utilising an energy of more than 50 watt must be altered, if possible, so as to comply with the regulations mentioned above.

(c) The receiving apparatus, protected in the best possible way against disturbances, must be able to receive signals with the wavelengths of up to 600 m., which are stipulated for the ship station.

(d) The primary energy of the station measured across the generator must under no circumstances exceed 1 kw.

(e) Larger energy than 1 kw. may, however, be utilised, if the ship is to interchange telegrams over a distance of more than 200 nautical miles (equal 370 km.) with the nearest station, or if communication, due to interference is not obtained unless by an increase of the transmitting energy.

(f) The station must be operated by one or more operators who have obtained certificates as specified below in Section 7.

The station must not be opened for communication until the telegraph department has issued a certificate, which will not be granted until the department, by inspection, is satisfied that the conditions set out in the licence granted by the Department of Public Works have been fulfilled.

II—INSTALLATION, SERVICE AND OPERATION OF PRIVATE SHIP STATIONS.

4. The apparatus of ship stations must at any time be in strict accordance with the conditions set out in the license for their establishment.

5. The hours of service of each coast station are decided by the Government Department.

As far as the hours of service of ship stations are concerned, these stations are divided into the following three classes:

- (1) Stations with continuous hours of service;
- (2) Stations with limited hours of service;
- and
- (3) Stations with no fixed hours of service.

During navigation stations with continuous hours of service must be attended to constantly at the aural apparatus. In the case of stations with limited hours of service the aural apparatus must be attended to during all of the hours of service as well as during the first ten minutes of each hour not comprised in the normal hours of service. Stations with no fixed hours of service are not obliged to keep any regular watch over the aural apparatus.

The classification of a ship as regards the hours of service of same shall be stated in the licence.

6. Any ship station must be fitted to utilise wavelengths of 600 m. and 300 m. respectively. The normal wavelength is 600 m. Small ships, may, however, be allowed to utilise wavelengths of 300 m.; but they must always be able to receive telegrams with a wavelength of 600 m. During the hours of service each ship station must be capable of being called with its normal wavelengths.

Ship stations maintaining continuous watch and ship stations with limited hours of service shall be bound to have a radiotelegraphic spare installation, the single parts of which

must be placed as safely as possible. This installation must have a source of energy of its own and must be capable of being put into use quickly, must be able to work satisfactorily for at least six hours and must have a minimal range of:

80 nautical miles (equal to about 150 km.) for ship stations belong to the first class (maintaining continuous watch).

50 nautical miles (equal to about 100 km.) for ship stations belonging to the second class (with limited hours of service).

This special installation is not required in the case of ships, the normal installations of which comply with the requirements of spare installations mentioned above.

7. The service of the ship station must be maintained by operators who are in possession of certificates granted by the Department of Public Works.

In cases of urgent necessity and during one voyage only the service of a ship station may be undertaken by one or more operators holding a certificate from a foreign Government which Government has joined the International Convention concerning radio-telegraphs.

The certificate shall certify

Partly the ability of the operator:

(a) In the maintenance of the apparatus and knowledge of their working.

(b) In the sending and receiving (by sounding) of telegrams with a speed:

(1) No less than twenty words a minute for obtaining a certificate of first class, and

(2) No less than twelve words a minute for obtaining a certificate of second class.

(c) In the knowledge of the regulations utilised, governing radiotelegraphic service.

Partly that the operator shall be bound to secrecy and subject to penalty, etc., for a breach of this condition as in the case of State telegraph operators.

Operators holding a certificate of second class may do service:

(a) On board ships utilising radiotelegraph in their own service or for the correspondence of the crew only.

(b) As assistant operators on board all ships having at least one operator holding a certificate of first class.

Ship stations with continuous service must be operated by at least two operators holding a certificate of first class.

The radiotelegraphic service of the ship stations is placed direct under the master of the ship concerned.

In the event of a contravention of the regulations governing the operation of the radiotelegraphic service, the certificate may be cancelled by the Department of Public Works.

No unauthorised person must be allowed to enter the wireless cabin.

8. If technically possible, ship stations must interchange telegrams with other stations (coast or ship stations), without regard to the system of radiotelegraphy employed at the station concerned. The interchange of telegrams with other ship stations must, however, be so arranged that the working of coast stations is not interfered with, these as a rule having the priority in public telegraph service.

The operation of a station must as far as possible be arranged so that it does not interfere with other stations.

Exchange of superfluous signals and words is prohibited. Experiments and practice shall only be permitted in so far as the service of other stations is not interfered with; therefore, they must be executed with no other wavelengths than those utilised in the case of public telegram exchange, and utilising as little energy as possible.

When a ship is in a Danish harbour her station must only be utilised for communication with ships in distress.

9. According to the London Convention, the Telegraph Department must notify the Berne Bureau of the ship installation, and the Telegraph Department can demand to be furnished with any information regarding the installation, service, and working of a ship station, both for this and for other purposes.

10. The Telegraph Department will see that all conditions for the fitting and operation of ship stations are complied with. The inspectors for this purpose, who are selected by the Director of Telegraphs, must at any time on showing their authority be admitted to inspect and test the station, provided that the ship is within Danish waters. All information required by the said inspectors must be immediately given, and their directions must be complied with, pending the decision of the Director of Telegraphs, or, that of the Department of Public Works.

For the proper carrying out of the inspection each of the inspectors shall be paid 20 kroner for the inspection and a daily remuneration in addition to travelling expenses; such amount shall be paid by the Telegraph Department, but will have to be refunded (on demand) by the owners of the ship in question.

III—HANDLING OF RADIOTELEGRAMS.

11. Radiotelegraph stations open for public service for the transmission and reception of telegrams may be used by any person, unless the public telegram exchange at the station in question is limited to a certain special kind of telegrams (see section 14).

The telegrams are divided into three classes:

- (1) State telegrams.
- (2) Service telegrams.
- (3) Private telegrams.

The right to transmit State telegrams and service telegrams, and the right to priority for such messages, is at any time governed by the provisions embodied in the International Telegraph Regulation and the Inland Telegraph Regulation governing the transmission of such telegrams over ordinary telegraph systems.

12. Regarding the radiotelegraph traffic, the handling of telegrams is governed by the International Radiotelegraph Service Regulation, Articles XIV-XV, XIX-XI, XLV-XLIX. The handling of telegrams to and from coast stations and over the ordinary telegraph and telephone system is at any time governed by the Inland and International regulations for such traffic.

13. State and service telegrams may under all conditions be written in code or cipher. Private telegrams in code or cypher may be interchanged only with coast stations of such countries where this method of communication is allowed.

14. The ship station may be licensed for:

Ordinary public telegraph communication.

Limited public telegraph communication (with specified ships, with specified shipping lines, etc.).

Private telegraph communication.

Special telegraph communication (exclusively for State use, etc.).

In the public telegraph communication the following special radiotelegrams are to be received and handled:

- (1) Radiotelegrams with prepaid reply.
- (2) Radiotelegrams (collated telegrams).
- (3) Radiotelegrams to be delivered by express messenger.
- (4) Radiotelegrams to be delivered by post.
- (5) Radiotelegrams with more addresses than one.
- (6) Radiotelegrams with certificate of arrival. Certificates of arrival are handled on lines of telegraphs only.
- (7) Paid service messages, except such as require a repetition or an information.

(8) Express telegrams, which are, however, only transmitted as such on the ordinary lines of telegraphs and under the proviso that the prescriptions of the International Telegraph Regulations are followed.

All stations are bound to receive, answer, and, if possible, further to communicate messages from ships in distress and give these absolute priority.

Ship stations, however, have no responsibility whatever regarding the radiotelegraph communication.

Ship stations intended for public telegraph service shall get such printed forms, service journals, tariff lists, etc., as are necessary for this service, from the Telegraph Department against payment of fixed amounts. It is the duty of the station to take care that a sufficient supply of these things is always available. Such stations must furthermore be governed by all the instructions regarding the installation and operation of the station and the handling of the traffic issued by the Telegraph Department.

15. The abbreviations mentioned below covering the terms also mentioned below may be utilised; they are written between two double hyphens before the address, and are charged as one word:

To be delivered to addressee only	MP
Delivered open	Ouvert
Private express telegram	Urgent or D
x Addresses	TMx
Reply paid x	RPx
Urgent reply paid x	RPDx
Collation	TC
To be delivered per post	Poste
Télégraphe restant	TR
Poste restante	GP
Post registered	PR
Poste restante registered	GPR
Telegraphic certificate of arrival	PC
Telegraphic urgent certificate of arrival	PCD
Certificate of arrival by post	PCP
Express messenger	Express
All addressed to be stated	CTA

16. The entire charge for radiotelegrams shall include:

(1) Charge for the radiotelegraphic handling, namely:

- (a) "Coast fee," which shall devolve on the coast station.
- (b) "Ship fee," which shall devolve on the ship station.

(c) "Transit fee," for the coast or ship stations being intermediary stations at the handling of the telegrams.

(2) Charge for handling over the ordinary telegraph and telephone system paid according to the general regulations.

The coast fee for Danish coast stations hall be 40 ctm per word, minimum 4 fr.

The ship fee shall be fixed by the owner of the ship station, subject to the approval of the Department of Public Works. It must not exceed 40 ctm. per word; a minimum charge per telegram may, however, be adopted, not exceeding the charge for ten words. Service telegrams concerning telegrams handled exclusively per radiotelegraph are handled without any charge between the radiotelegraph stations, but are liable to charge when passing lines of telegraphs. Press telegrams at a reduced charge will not be received.

17. The entire charge for the handling of a radiotelegram from the sender to the addressee is to be collected from the sender by the station where it originates. The stations must not collect larger amounts than allowed in the tariffs.

18. All pecuniary liability in consequence of the operation of the ship stations is payable entirely by the owners of the ship in question, without regard to whether the liability in any case may have been due to fault or neglect on the part of the operators.

19. The original radiotelegrams with the vouchers pertaining thereto must, if possible,

be sent once a month by the ship stations to the Telegraph Department.

20. Reimbursements of charges paid, and accounts with the Telegraph Department, are governed by the International Radiotelegraph Service Regulation, Articles XLI and XLII.

IV.—OTHER REGULATIONS.

21. Stations on board ship under foreign flags must not be operated during the time such ships are in a Danish harbour, except to receive, answer and forward messages from ships in distress.

22. When the interests of the State require it, the Government may reserve to itself the right to prohibit all radiotelegraphic communication from ships, Danish or foreign, in Danish waters, and to make the necessary regulations to carry through such prohibition.

23. The maximum penalty payable to the State by the owners or radiotelegraphic company concerned for contravening the foregoing regulations is 400 kroner (£22), and all unlawfully fitted or utilised apparatus may be forfeited. Such contraventions are dealt with in the public police court, and proceedings may only be taken according to demand by the Minister for Public Works.

24. These regulations shall come into force on July 1st, 1913.

DODECANESE

(See under ÆGEAN ISLANDS.)

DOMINICAN REPUBLIC

(See also Map Section)

THE island of Santo Domingo is divided between two States, the Western being the Republic of Haiti, the Eastern the Dominican Republic. French is the official language of the former, Spanish of the latter. The first constitution of the Dominican Republic bears the date of November 18th, 1844; it has been amended several times, and the one in force at present bears the date of February 22nd, 1908. The President administers the Executive, the Legislative functions devolving on a National Congress with two Chambers, the Senate and Cámara de Diputados (House of Deputies). The United States landed troops in May, 1916, and is supervising the administration for the present. The Republic covers an area of 19,332 square miles and is divided into 12 provinces. The population is calculated at 897,405 inhabitants.

CONTROL.

The supervision of the wireless service is under the control of the Sub-Dirección General of Posts and Telegraphs, who, in turn, is subordinate to the Director-General of Posts and Telegraphs, under the Department of "Fomento y Comunicaciones."

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Lieut.-Comdr. R. M. Warfield, C.E.C., U.S. Navy	Officer in Charge of the Department of "Fomento y Comunicaciones" ..	Government Palace, Santo Domingo City
Dr. Eduardo R. Soler, C.E. ..	Director-General of Posts and Tele- graphs	Senate Building, Santo Domingo City
—	Sub-Director General of Posts and Telegraphs	Senate Building, Santo Domingo City
H. E. Manley	Radioman	Santo Domingo City.

ORGANISATION.

The first land wireless station was erected at the capital city of Santo Domingo in 1908. The apparatus, supplied by the de Forest Company of New York, did not work satisfactorily, and despite the using of a power of 20 kW., only established irregular communication with Puerto Rico. After a lapse of five years, a 2-kW. set was installed in September, 1913, and regular public communication was instituted with Puerto Rico. In addition to this publicly owned station, there is a station at La Romana (in the Province of Seybo), owned by the (Sugar Refining) Central Guanica Company in Puerto Rico. The latter relays to the British Cable Company in Puerto Rico, and thus touch is maintained with the outside world.

In March, 1919, the two kilowatt set in the Radio Station of Santo Domingo was replaced by a new set, which includes one Radio Transmitter "Marconi System," of 5 kilowatts, 500 cycles, of 250 volts, alternating current.

Communication can now be made direct with San Juan, Puerto Rico, without the intervention of the Ensenada Station. The transmission of messages *via* Ensenada is now assured by day as well as by night, excepting when there are electric disturbances. It is also possible to have direct communication with Guantanamo, Cuba, especially at night, and with Port-au-Prince, Haiti.

Two steel towers, each 225 feet high, have been erected for the antennæ, which are 500 feet in length.

There are no public aviation, meteorological or press services, but there is an extensive storm warning service. The United States air station sends a daily weather report to Washington.

ADMINISTRATION.

There are no special Laws and Regulations relating to wireless telegraphy and telephony.

A public contract is in force with the Central Guanica and Central Romana (Sugar Refining) Companies, dated December 19th, 1913. This lays down the conditions under which the two companies conduct for the Dominican Government Public Radiotelegraphic Service through the medium of their stations.

Clause I deals with the rates per word for foreign messages, which for the general public amounts to 30 cents per word.

Clause II deals with radio rates in the island—8 cents per word.

Clause III deals with special rates for officials of the States and the two companies, press rates, etc.

Clauses IV, V, and VI deal with matters and methods of accounting.

DUTCH EAST INDIES (Netherland Indies)

(See also Map Section)

THE Dutch possessions in Asia, forming the territory of Dutch East Indies, are situated between 6° N. and 11° S. latitude and between 95° and 141° E. longitude. They have an area of 683,000 square miles and a population of 49,161,047.

CONTROL AND ORGANISATION.

The laws and regulations affecting wireless in the Dutch East Indies are contained in the statutes of Holland, to which reference should be made.

DUTCH WEST INDIES

(See also Map Section)

Including : Surinam or Dutch Guiana and Curaçao.

DUTCH GUIANA (Surinam) is situated on the north coast of South America, between 2° and 6° N. latitude and 53° 50' and 58° 20' E. longitude, it has an area of 46,060 square miles, and a population of 113,181.

CONTROL AND ORGANISATION.

A small station is in operation at Paramaribo, belonging to the Surinam Bauxite Co. It is used for communication between the company's head office and their staff, situated at their various concessions in the interior of the country, some 126 miles distant.

The station was supplied by the Telefunken Co., and is operated by an ex-operator of the British Navy, formerly employed at the Admiralty Wireless Station in Demerara. It is not open for public general correspondence, but incoming ships report their arrival by this means.

There are no clubs or other wireless services.

ADMINISTRATION.

There is at present no legislation dealing with wireless telegraphy and telephony.

CURAÇAO consists of two groups of islands about 500 miles apart, they are Curaçao, Bonaire, Aruba, the southern part of St. Martin, St. Eustache and Saba. They have an area of 403 square miles and a population of 53,702.

CONTROL AND ORGANISATION.

Stations are in course of erection on the islands of Saba and St. Eustache.

ADMINISTRATION.

The laws and regulations affecting wireless in Curaçao are contained in the Statutes of Holland, to which reference should be made.

ECUADOR

(See also Map Section)

THE Republic of Ecuador comprises the provinces which formed the ancient Presidency of Quito, the Colon Archipelago (Galapagos Islands) and the so-called Orient Territory. The total area is some 196,000 square miles, and the population about 1,323,590.

CONTROL AND ORGANISATION.

On the 1st March, 1920, the Government decreed the official monopoly of wireless communications in the territory of the Republic, and on the 17th April of the same year Ecuador adhered to the International Radiotelegraphic Convention of London, 1912.

The organisation and everything concerning wireless telegraphy and telephony is under the Direction of the Minister of the Interior, assisted by the Director-General of Telegraphs.

Officers and men in the Guayaquil artillery school are put through a comprehensive course in radiotelegraphy with the aid of laboratory apparatus.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Señor Don Guillermo Destruge ..	Director-General of Telegraphs	Quito
General Delfín B. Triviño ..	Minister of the Interior	Do.

The first wireless telegraph station was installed in 1913 at Guayaquil by Señor Don Geo. Chambers Vivero, Captain of the Port, for the purpose of communicating with vessels navigating in the Guayaquil River. It has a range of about 80 miles. The Marconi Company has recently completed a station at Santa Elena Point having a range of over 500 miles.

There are at present three radiotelegraph stations, one at Quito, the capital of the Republic; and two coast stations, one at Guayaquil, the principal port, and Esmeraldas.

The stations at Quito and Guayaquil are intended to ensure the more efficient communication between those two towns and to correspond with the station of Esmeraldas. The stations at Guayaquil and Esmeraldas also correspond with ships.

These stations were constructed by the Société Française Radio-Electrique of Paris and are on the musical spark system. The stations at Quito and Guayaquil are 10 kW., with antenna of 100 metres and the station at Esmeraldas is 5 kW., with antenna of 50 metres; each are of the umbrella type. Their wavelengths are as follows:—

*Guayaquil ..	3,200m., 2,500m., 1,800m., 600m.
Quito	3,200m., 2,500m., 1,800m.
Esmeraldas ..	2,500m., 1,800m., 600m.

The Marconi Company has a 5 kilowatt station which is not yet in the public service, but which will shortly be utilised, by virtue of an agreement which it is hoped will be concluded shortly.

Aviation, which sooner or later will become more general, demands that an efficient wireless system shall be created for the rapid transmission of meteorological information in all parts of the country. The progress of aviation is bound up with that of wireless telegraphy.

Communication is projected between the Galapagos Islands and the continent. A station will be placed at a point on the coast which shall permit of exterior communication. All these matters are receiving consideration and the hope is felt that they will be realised.

The stations of Quito and Guayaquil have been adapted for a system which is capable of effecting an efficient and permanent service, as apparatus exists which has recently been tested and found adequate to ensure this class of permanent service, notwithstanding the difficulties of territory and atmosphere; these questions are of great importance in view of the geographical position of the country. As the traffic develops, small stations will be established in towns of lesser importance.

The question of wireless telegraphy in Ecuador is receiving consideration from the technical and economical points of view, and on March 28th, 1921, a contract was signed with the Compagnie Générale de T.S.F. for the installation of nine wireless stations, including one for inter-continental service. This contract, it is expected, will shortly be ratified.

EGYPT

(See also Map Section)

GENERALLY known among the Arabic speaking peoples as "Misr," Egypt was again given independence in March, 1922, with Fuad I as King. It has a total area of about 350,000 square miles of which only some 12,226 square miles are cultivated and settled. The estimated population is 12,750,918.

CONTROL.

Wireless Telegraphy forms a branch of the Ministry of Communications and is controlled by the State Telegraph Department of that Ministry. The following is the position in regard to land stations:—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. F. Schreiber	Inspector-General of Telegraphs and Telephones.	Cairo.
Mr. W. J. Hilyer, B.Sc., M.I.E.E., A.M.I.C.E.	Chief Engineer of Telegraphs and Telephones.	Cairo.
Mr. H. E. Watterson	Wireless Engineer	Ras el Tin, Alexandria.
Mr. L. G. Farthing	Wireless Superintendent ..	Ras el Tin, Alexandria.

* The information regarding these wavelengths were supplied by the Ecuador authorities, but the 1st Edition (August, 1921) Wireless Board list of radiotelegraphic waves gives them as follows:—

Guayaquil ..	2,500m., 1,400m., 800m., 300m.
Quito ..	3,500m., 1,400m., 800m., 300m.
Esmeraldas ..	1,800.

The following is the position in regard to land stations : Public service to ships, Ras el Tin, Alexandria and Port Said. Abou Zabal, designed to form part of the "Imperial Chain."

ADMINISTRATION.

Wireless telegraphy is a State monopoly, in accordance with the following Khedivial Decree, dated May 12th, 1906. This power is now invested in the Ministry of Communications. (The Ministry of Communications did not exist in 1906) :—

New laws and regulations concerning wireless in Egypt are in course of preparation, but at the time of going to press are not in final form.

A—Khedivial Decree.

B—Experiments in Wireless Telegraphy.

KHEDIVIAL DECREE, DATED MAY 12TH, 1906.

1. Wireless Telegraphy shall be a State monopoly, and no installation shall be established or used except by the Government or with the sanction of the Government.

2. The Minister of Public Works shall be responsible for the administration of this Law.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

1. Under the Khedivial Decree, dated May 12th, 1906, Wireless Telegraphy in Egypt is a State monopoly, and the authority of the Minister of Communications is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR THE USE OF RECEIVING APPARATUS, CONDITIONS OF ISSUE, ETC.

2. Formal licenses to conduct experiments in wireless telegraphy cannot at present be granted, but the Minister of Communications is prepared to authorise the use of wireless apparatus for the reception of signals on the following conditions :—

3. The applicant shall produce evidence of nationality and two written references as to the applicant's character. Such references should be given by persons of standing who are not related to applicant.

4. There shall be no divulgence to any person other than properly authorised officials of the Egyptian Government or a competent judicial authority or any use whatever made of any message received by means of the apparatus.

5. The installation shall be subject to the approval of the Minister of Communications.

6. The aerial wires shall not exceed the under-mentioned maximum height and dimensions :—

Extreme height of aerial above ground, 30 metres.

Total length of wire including leading-in wires : 30 metres for single wire aerial; 42 metres of wire where two or more wires are used (e.g., total length 21 metres of double wire).

7. Valves shall not be used without the special authority of the Minister of Communications.

8. The apparatus shall be open to inspection at all reasonable times by properly authorised officials of the Egyptian Government.

9. An annual fee of P.T.50 shall be paid in respect of each experimental receiving license to cover the expenses of the issue of the license and the inspection of the station.

10. Authority to use wireless telegraph apparatus cannot be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian, who should proceed as indicated above and should state his (or her) relationship to the applicant. In such cases the evidence and references specified in condition (3) should be furnished BOTH AS REGARDS THE APPLICANT AND HIS PARENT OR GUARDIAN, and the latter will be personally responsible for the carrying out of the conditions of the license.

11. The applicant should furnish (by letter addressed to the Egyptian State Telegraphs) :—

(a) A formal acceptance of the conditions of this license, copy of which will be delivered to him against receipt.

(b) Evidence and references described in (3).

(c) His full name, age, and particulars of his occupation.

(d) A remittance of P.T.50.

(e) A description of the apparatus which it is proposed to install, and if authority is desired for the use of valves, a diagram of the circuit in which they would be used.

(f) A sketch showing the form, height and dimensions of the proposed aerial wires (including leading-in wires).

(g) The address at which the apparatus would be installed.

12. This license is temporary and is subject to cancellation by an order of the Minister in case of breach of any of the conditions above mentioned, or at the discretion of the Minister if he deems it necessary in the general interest.

Date

Signature of H.E. THE MINISTER.

Signature of the licensee

(and his parent or guardian, if any).

ERITREA

(See also Map Section)

SITUATED on the coast of the Red Sea from Cape Kasar (18° 2' N.) to Cape Dumeirah on the Strait of Bab-el-Mandeb (12° 30' N.) this colony is an Italian possession. It has an area of about 45,800 square miles and a population of 405,681.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain information regarding wireless in Eritrea.

ESTHONIA

(See also Map Section)

THE independence of Esthonia was declared on February 24th, 1918. It comprises the former Russian Government of Estland, Northern Livland, the north-west portion of Pskoff Government, and the islands of Saaremaa (Oesal), Hiiumaa (Dago) and Muhumaa in the Baltic Sea. It has an area of about 23,160 square miles and a population of 1,750,000.

CONTROL AND ADMINISTRATION.

Wireless Telegraphy and Telephony is under the administration of the Director-General of Posts and Telegraphs.

(We have not been able to obtain information regarding the Laws and Regulations of Esthonia in time for publication in this edition.)

FALKLAND ISLANDS

(See also Map Section)

THIS is a Crown Colony situated in the South Atlantic, 300 miles east of the Magellan Straits. The area covers 6,500 square miles, besides South Georgia, 1,000 square miles (estimated), and there are several dependencies—e.g., the South Shetlands, South Orkneys, Sandwich Group, and Graham's Land. The population is 3,275.

The Administration is conducted by the Governor, assisted by an Executive Council and a Legislative Council.

CONTROL.

Wireless telegraphy is under the supervision of the Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. Craigie-Halkett	Postmaster	Stanley
Mr. J. Mercer	Senior Operator	Stanley
Mr. R. Campbell	Junior Operator	Stanley
Mr. T. Hooley	Junior Operator	Stanley

ORGANISATION.

There are two wireless stations, one at Stanley Harbour, East Falkland, which belongs to and is controlled entirely by the Admiralty, the other at Fox Bay, on the East Coast of the West Island, controlled by the Public Works Department of the Colony under the ownership of the Colonial Government.

No licenses are issued for radiotelegraphic working, and no aviation stations are in existence or projected.

ADMINISTRATION.

Radiotelegraphy is administered under the following Acts:—

A—Wireless Ordinance.

B—Wireless Telegraphy Regulations.

WIRELESS ORDINANCE.

DATED MARCH 15TH, 1912.

A The following Ordinance relating to wireless telegraphy came into force on March 15th, 1912:—

1. No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony except under and in accordance with

a license granted in that behalf by the Governor in Council.

2. No person shall work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Council, and the Governor in Council may, by any such regulations, impose penalties, recoverable

before a Stipendiary Magistrate or any two Justices of the Peace in a summary manner, for the breach of any such regulations, not exceeding twenty pounds each for offence, and may provide for the forfeiture of any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

3. If any person establishes a wireless telegraph station without a license in that behalf or instal's or works any apparatus for wireless telegraphy without a license in that behalf he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding twenty pounds or to imprisonment not exceeding three months and, on conviction in the Supreme Court, to a fine not exceeding one hundred pounds, or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license.

4. If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a license in that behalf or contrary to the provisions of the regulations made under this Ordinance, he may grant a search warrant to any constable or to any officer appointed in that behalf by the Governor and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy.

5. The expression "wireless telegraphy" means any communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

6. The Wireless Telegraph Ordinance, 1903, is hereby repealed.

7. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1912.

WIRELESS TELEGRAPHY REGULATIONS.

BIn pursuance of the powers in him vested by section 2 of the "Wireless Telegraphy Ordinance, 1912," His Excellency the Governor, by and with the advice of the Executive Council, is pleased to make the following Regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this Colony shall be worked in such a way as not to interfere with (a) Naval signaling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these Regulations shall on summary conviction before a stipendiary magistrate or any two justices of the peace be liable to a penalty not exceeding twenty pounds for each offence and to the forfeiture of any apparatus for wireless telegraphy installed on such ship and in default of payment to be imprisoned with or without hard labour for a period not exceeding three months.

6. These Regulations shall come into force on the first day of September, 1912.

Dated at Government House, Stanley, this 21st day of June, 1912.

By Command,

T. A. V. BEST,
Colonial Secretary.

FARÖE ISLANDS

(See under DENMARK)

FEDERATED MALAY STATES

(See also Map Section)

Including: Perak, Selangor, Negri Sembilan, and Pahang.

THE Federated Malay States occupy a large portion of the Malay Peninsula, and are under British protection. The area is approximately 27,506 square miles, with a population of 1,036,999.

ADMINISTRATION.

Wireless telegraphy is regulated by:—

A—Enactment No. 7 of 1913, and

B—Rules under the above Enactment.

The text of both the enactment and the rules made under its provisions will be found below.

ENACTMENT NO. 7 OF 1913.

A An Enactment to make better provision for the regulation of Wireless Telegraphy.

July 30th, 1913.

It is hereby enacted by the Rulers of the Federated Malay States in Council as follows:—

1. (1) This enactment may be cited as "The Wireless Telegraphy Enactment, 1913," and shall come into force upon the publication thereof in the *Gazette*.

(2) The Enactments specified in the schedule are amended by deleting from the interpretation of "Telegraph" in section 2 of each of the said Enactments the words "whether worked with or without lines of wires."

2. (1) In this Enactment the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraphs Enactments, 1905," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government of the Federated Malay States or of any of them or by subjects of any of the rulers of the said States or by bodies corporate established under and subject to the laws of the said States or of any of them and having their principal place of business within the said States or by any person residing within the said States.

(2) Nothing in this Enactment shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Chief Secretary to Government may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship except under and in accordance with a license granted in that behalf by the Chief Secretary to Government.

(2) Every such license shall be in such form and for such period as the Chief Secretary to Government may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Chief Secretary to Government shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Enactment except with the previous sanction of the Public Prosecutor.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the

jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Chief Secretary to Government may make rules for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licenses under this Enactment are to be made;

(b) For prescribing the fees payable on the grant of any license;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, whilst such ship is in any of the harbours of the Federated Malay States;

(e) For prohibiting or regulating, in case at any time in the opinion of the Chief Secretary to Government an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, in the waters of the Federated Malay States, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Chief Secretary to Government may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) No rules made in respect of the matters described in paragraphs (c), (d) and (e) of sub-section (1) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Chief Secretary to Government that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Chief Secretary to Government may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Enactment or of any rule made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Enactment and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Enactment or any rules made thereunder may be had and recovered before the Court of a Magistrate of the First Class.

SCHEDULE.

State.	No. and year.	Short title.
Perak ..	6 of 1905	The Telegraphs Enactment, 1905
Selangor ..	9 "	" "
Negri Sembilan ..	7 "	" "
Pahang ..	8 "	" "

RULES.

UNDER "THE WIRELESS TELEGRAPHY ENACTMENT, 1913."

B In exercise of the powers vested in him by section 6 of "The Wireless Telegraphy Enactment, 1913," the Chief Secretary to Government has made the following rules:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked in such a way as not to interfere with (a) naval signalling or (b) the working of any wireless telegraph station lawfully established installed or worked in the Federated Malay States or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. (i.) No apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, shall be worked or used whilst such ship is in any of the harbours of the Federated Malay States.

(ii.) To ensure the proper enforcement of paragraph (i.) of this rule—

(a) Locally owned ships and British ships in harbours of the Federated Malay States shall completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(b) Foreign ships in harbours of the Federated Malay States shall take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus; provided that foreign ships remaining in a harbour of the Federated Malay States for less than twelve hours may, at the discretion of the Harbour Master or other competent local authority, be permitted to leave their aerials up, if the same are disconnected in the manner described in the last preceding clause;

(c) The operating room of any locally owned or British or foreign ship shall, in any case where the Harbour Master or other competent local authority so directs, be sealed up and kept sealed up while such ship is in a harbour of the Federated Malay States, and such other steps may be taken as to the Harbour Master or other competent local authority seem expedient.

3. If at any time, in the opinion of the Chief Secretary to Government, an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, while in the waters of the Federated Malay States shall be subject to such further rules as may be made by the Chief Secretary to Government from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Expressions defined in "The Wireless Telegraphy Enactment, 1913," have in these rules the meanings thereby assigned to them.

FIJI ISLANDS

(See also Map Section)

A BOUT 1,100 miles north of New Zealand lie some 250 islands (a few merely bare and uninhabited rocks), which cover a square of the South Pacific Ocean about 300 miles each way and constitute the British Colony of Fiji. Their latitude lies from 15° 45' to 21° 10' S.; whilst their longitude stretches from 176° 0' E. to 178° 0' W. The gross area of the group amounts to about 7,435 square miles, with a population of 162,604.

The administration is that of a British Crown Colony, the Governor being assisted by an Executive Council of six and a Legislative Council of twenty members.

CONTROL.

The four wireless telegraph stations in Fiji are owned and worked by the Colonial Government through the department of Posts and Telegraphs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. P. St. Julian	Acting Superintendent of Telegraphs and Telephones	Suva
W. G. Covell, A.M.I.E.E. ..	Assistant Engineer	Suva
W. Kearsley H. Roffey K. Lawry L. M. Browne A. O. Barrack W. G. Ragg	Wireless Operators in Charge of Stations .. Wireless Operators	— —

Stations.—Suvaradio, Labasaradio, Taviuniradio, and Savusavuradio.

There are no aviation or ship stations licensed in Fiji. Licenses have recently been granted for privately owned experimental stations to two members of the Fiji Defence Force, one situated at Lautoka, the other at Sigatoka. The colony possesses no wireless clubs or societies.

Weather reports are sent out daily.

ORGANISATION.

The first Wireless Telegraph Ordinance was passed in 1903. This was revoked by Ordinance No. XXV of 1912 (printed in the YEAR BOOK for 1917), which was in turn revoked by Ordinance V of 1913. New regulations were made in 1917, which have since been revoked, and the original regulations made in 1913 are now in force.

No licenses for wireless telegraph working have been issued since 1914. There are no stations existing or projected for aviation or meteorological purposes.

ADMINISTRATION.

The following pages contain the text of :—

A—Ordinance No. V of 1913.

B—Schedule based thereon.

C—Form of Experiment License.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

Dated June 19th, 1913.

A Be it enacted by the Governor with the advice and consent of the Legislative Council as follows:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under or in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such purpose as the Governor may determine and shall contain the terms conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship whether British or foreign while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this ordinance and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a stipendiary magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance he may grant a search warrant to any officer of constabulary or any person appointed in that behalf by the Inspector-General of Constabulary and named in the warrant and a warrant so granted shall authorise the officer of constabulary or person named therein to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (i) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds and upon such conviction the court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a stipendiary magistrate on the complaint of the Inspector-General of Constabulary or of any person thereto authorised by him in writing and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance 1912 is hereby repealed.

Passed in Council this twenty-sixth day of May in the year of our Lord one thousand nine hundred and thirteen.

SCHEDULE. REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with:—

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge

of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

LICENSE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES, GRANTED BY THE GOVERNOR IN PURSUANCE OF SECTION 3 OF ORDINANCE NO. V OF 1913.

C License is hereby granted to (hereinafter called the licensee), subject to the conditions hereinafter contained during the term or period commencing on the and terminating on the day of

(i) To establish, install and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) To transmit and receive messages by means of wireless telegraphy at the said stations.

Provided that the licensed apparatus shall be worked and the messages shall be transmitted and received solely for the purpose of conducting experiments in wireless telegraphy and for no other purpose whatever.

2. The licensed apparatus shall not be used by the licensee or by any other person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

3. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony of Fiji or the territorial waters abutting on the coasts of the Fiji Islands by or for the purpose of the Government of Fiji or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary or prescribed by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

(4) The licensee shall at all times indemnify the Government against all actions, claims and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act, licensed or permitted, by these presents.

4. (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) Whenever the operators at any of the said stations of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding, they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall, if so required, in writing by the Colonial Secretary cease to use the licensed apparatus for such period (not exceeding... hours in any one day) as may be specified by the Admiralty.

(4) If the Governor is of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this Indenture.

5. Neither the licensee nor any person on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by or for the purpose of the Government of Fiji, or by any licensee of the Colonial Secretary (other than the licensee).

6. The Superintendent of Telegraphs and Telephones and his engineers, agents and assistants may, from time to time, and at all reasonable times, enter upon or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the working and user of such apparatus and telegraphic instruments respectively, and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the said Superintendent the right for the purpose aforesaid of entry from time to time and on such of the said stations and premises as may be in the possession or occupation of any person or persons other than the licensee.

7. (1) All apparatus used or intended to be used under this license shall be so erected, fixed, placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance, working or user of any telegraphic line of the Government which may from time to time exist or which it is probable that the Government may have occasion to erect, place, fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof.

(2) In case any telegraphic line of the Government shall be damaged or the efficient working or user thereof shall be wholly or partially interrupted or otherwise interfered with and the Superintendent of Telegraphs and Telephones for the time being shall certify in writing under his hand that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used under this licence or by anything done by on behalf or with the permission of the licensee in relation thereto the licensee shall on demand pay to the Colonial Secretary all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order, and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said engineer shall certify that such addition or substitution is reasonably required.

8. Except with the consent in writing of the Colonial Secretary the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses, powers or authorities hereby granted or any of such licenses, powers or authorities.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the licensed apparatus as is within the Colony of Fiji or the territorial waters thereof or any part of the licensed apparatus to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the Governor may enter upon stations specified in the Schedule hereto or any of them and take possession thereof and use the same as aforesaid.

10. The Colonial Secretary may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may in writing revoke and determine those presents and the licensed powers and authorities hereinbefore granted and each and every of them, and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Nothing in these presents shall prejudice or affect the right of the Governor from time to time to establish, extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreement for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony of Fiji by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

13. Any notice, request or consent (whether expressed to be in writing or not) to be given to the licensee under these presents may be served by sending the same by registered letter addressed to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to the Colonial Secretary.

By Command,

Colonial Secretary.

Given under my hand this day of

THE SCHEDULE BEFORE REFERRED TO :

Name of Station.	Character of Apparatus.		
	Maximum range of signalling with the Licensee's	Power (Current and Voltage).	Source of Power.

FINLAND

(See also Map Section)

THE independence of Finland was proclaimed during the Russian revolution and a Republic set up, adopting the new Constitution in 1919. It is bounded on the North by Norway, the West by Sweden and the Gulf of Bothnia, the South by the Gulf of Finland, and includes a large part of Lapland. It has an area of 149,586 square miles and a population of 3,335,237.

CONTROL AND ORGANISATION.

The government possess the sole right to erect and use wireless telegraph and telephone systems on Finnish Territory. Private persons may erect and use wireless telegraph and telephone appliance on land, ships and aircraft, subject to obtaining permission from the Ministry for Communications and Public Works. The systems now in use are under the administration of the War Ministry; the care and protection of all systems being under the control of the Army Wireless Corps, both as regards their construction and use.

ADMINISTRATION.

Wireless communications are carried out in accordance with the International Telegraph Convention (concluded in St. Petersburg in 1875), and regulations pertaining to the same (as revised in Lisbon in 1908), as well as with the International Wireless Convention with the final Minutes and Regulations (concluded at the Wireless Conference in London in 1912).

The following Laws have been passed regarding the construction and use of wireless telegraph and telephone systems:—

- A**—Law respecting Electric Plants for Wireless Telegraphy and Telephony.
- B**—Order in Council concerning the use of Wireless Telegraphy on board Foreign Ships.
- C**—Charges for Wireless Communications.

LAW

A RESPECTING ELECTRIC PLANTS FOR WIRELESS TELEGRAPHY AND TELEPHONY.

Given in Helsingfors, December 23rd, 1919.

1. The Government has the sole right on the territory of the State to erect and use electric plants for wireless telegraphy and telephony.

2. Private persons may, however, also, by special permission, erect and use such plants as

mentioned in the preceding paragraph, subject to the regulations set out hereinafter.

3. A person who wishes to erect such plants as mentioned in Art. 1 on land, stationary ship, movable ship or aircraft, shall apply for the necessary permission to the Ministry for Communications and Public Works.

4. The permission mentioned in Art. 3 shall be granted in accordance with the general principles, laid down by the Council of State, for a limited period in no case exceeding ten years.

5. The Council of State shall sanction the regulations required for the use of the systems, which this law refers to, in foreign ships moving in Finnish territorial waters.

6. Any person who erects or uses a system to which this law refers, without having obtained the required permission, shall be fined by penalty of 500—10,000 Finnish marks, with the forfeiture of the system at the same time, except in cases where the act is of such a nature that the criminal law prescribes a more severe punishment.

Should the system not have been constructed in accordance with the regulations laid down for the granting of the permission, or should the regulations in any other way be infringed, a fine not exceeding 1,000 Finnish marks shall be imposed, unless the criminal law prescribes a more severe punishment.

Should a system be constructed without the required permission, or against the regulations issued at the time of the granting of the permission or should the regulations in any way be infringed, it is the duty of the Governor of the Province concerned to take immediate steps for the prevention of the use of such a system. The instructions given by the Governor in the matter must be complied with, notwithstanding appeals, until otherwise is decided.

7. If sentence shall have been passed in accordance with Art. 6, para. 2, the Ministry for Communications and Public Works shall have the right to withdraw the permission granted.

8. The provisions made in the criminal law, Chapter 40, Section 15, for the protection of telegram correspondence and telegram immunity shall also apply to information transmitted through the systems referred to in this law.

What, in the said section, is stipulated about telegraph officials shall also apply to persons employed in the privately owned telegraph and telephone stations established by virtue of this law.

9. The provisions of the Criminal Law, Chapter 34 Section 12, and Chapter 35 Section 1, concerning prevention of or interference with the work of telegraph and telephone stations, or the causing of damage to telegraph or telephone, shall also apply, where possible, to such systems as this law refers to.

To be observed by all whom this law may concern.

Helsingfors, December 23rd, 1919.

K. J. STAHLBERG,

President of the Republic.

SANTERI POHJANPALO,

Minister for Communications and Public Works.

ORDER IN STATE COUNCIL.

B Concerning the use of wireless telegraph and telephone systems on board foreign ships when moving in Finnish territorial waters.

Given in Helsingfors, September 29th, 1921.

By virtue of the law concerning electric plants for wireless telegraphy and telephony, given December 23rd, 1919, the Council of State has issued the following Order:—

1. Electric systems for wireless telegraphy and telephony on board foreign ships, not stationary in Finnish territorial waters, may be used in a Finnish harbour only by special permission granted by the Telegraph Administration after consultation with the Chief of Staff for Coastal Defence, and subject to the regulations laid down by the Telegraph Administration.

Neither may the systems mentioned in the preceding clause be used on board foreign ships in Finnish territorial waters within less than

ten (10) nautical miles' distance off a Finnish coastal station, except in cases of distress or when required for telegraphic communications with the nearest situated coastal station.

The Telegraph Administration, shall have the right, after consultation with the Chief of Staff for Coastal Defence, to prohibit or limit the use of telegraph or telephone systems on board foreign ships, except in cases of distress, also when in other parts of Finnish territorial waters than those mentioned in 2 mom.

2. The Telegraph Administration shall have the right to issue instructions for the prevention of the use of Wireless telegraph and telephone systems on board foreign ships within such territory where the use of such systems in accordance with Art. 1 is prohibited.

3. It shall be the duty of the Telegraph Administration to publish in a suitable way for the information of seafaring people, either once for all or for certain periods or certain cases, regulations and instructions issued in pursuance to Art. 1, para. 9, 3 mom., and Art. 2. The Mercantile Marine Board, the Customs authorities, and the Governors of the Provinces concerned, shall, through their subordinates, supervise the observance of the regulations and instructions thus issued.

4. When wireless telegraph and telephone systems are used on board foreign ships sailing in Finnish territorial waters, the regulations in force, contained in the International Wireless Telegraph Convention and Service Instructions pertaining thereto, shall be observed where applicable, except in cases for which otherwise is stipulated.

5. Infringement of these regulations, or of any regulations issued by the Telegraph Administration by virtue of this Order, shall be punished with fines of 500—5,000 Finnish marks.

6. Legal actions for infringements, as mentioned in Art. 5, shall be brought before the town court of the nearest town.

7. The provisions laid down in Arts. 5 and 6 do not apply to war ships.

To be observed by all whom this Order may concern.

Helsingfors, September 29th, 1921.

ERKKI PULLINEN,

Minister for Communications and Public Works.

K. R. SALOVIUS.

C The President of the Republic has fixed the following charges for wireless communications temporarily conducted in accordance with the Order in State Council:

1. For communications exchanged between the Finnish mainland and Finnish vessels, and vice versa.

A charge per word, which shall include the coast or wireless telegraphic charge of 30 centimes and the ship's charge of 15 centimes per word, as well as the charge for each word paid for telegraphic communications by wire. The rate of exchange chargeable for the centime shall be that charged in each case for telegraphic communications by wire with foreign countries. The minimum fee for telegrams transmitted through wireless telegraph, including the wire charge, is 12 Finnish marks.

2. For other wireless communications:

The same charge, as stipulated by International Regulations, and when necessary also including the charges for telegraphic communications by wire.

The coast charges will be collected from foreigners in accordance with International Regulations.

There are at present 19 Finnish passenger and merchant ships equipped with wireless.

FIUME

(See also Map Section)

THE independent state of Fiume was created by the Treaty of Ropallo on November 12th, 1920. A provisional government is in force. The area of this state is 8 square miles and it has a population of 49,806.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Fiume.

FRANCE AND ALGERIA

(See also Map Section)

Including : Andorra.

FRANCE is the most westerly of Central European countries. In latitude it lies between $40^{\circ} 29''$ and $51^{\circ} 5''$ N.; in longitude between $7^{\circ} 45''$ E. and $4^{\circ} 45''$ W. The area of its 87 departments (including the isle of Corsica) is estimated at 212,659 square miles, with a population of 39,209,766.

Algeria (French since 1830) is reckoned as an integral part of France. It has an area of 222,180 square miles, and a population of 5,800,974.

CONTROL.

Radiotelegraphy in France is a State monopoly.

The commercial use of wireless telegraphy in France and Algeria has been placed under the control of the Minister of Posts and Telegraphs. The Department of Telegraphs deals with all matters relating to the administration of commercial wireless telegraphy, and this Department also controls inland and foreign telegraphs. The Ministry of War and the Ministry of Marine control the use of wireless telegraphy in the Army and Navy respectively.

As far as the large high power radiotelegraph stations of France are concerned they are under the jurisdiction of different Government Departments, as follows:—

Eiffel Tower ..	.. Ministry of War.
St. Pierre des Corps ..	.. do.
Basse-Lande (Nantes) ..	.. Ministry of Marine.
La Doua (Lyons) ..	} These two stations, erected by the War Department, are worked by the Administration of Posts and Telegraphs, for Public Service, and in principle for communication with the stations of the French Inter-Colonial districts.
Bordeaux-Lafayette (Croix d'Hins) ..	

A large high power station is under consideration by the authorities. It will be situated at Pézenas.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. le Capt. de Vaisseau Lagorio ..	Directeur du Service de la Télégraphie sans Fil	5 rue Froidevaux Paris (14 ^{ème})
M. Lahaye	Ingénieur au Service de la Télégraphie sans Fil	do.
M. Hamel	do.	do.
M. le Corbellier	do.	do.
M. Veaux	do.	do.
M. Reynaud	Inspecteur au Service de la Télégraphie sans Fil	do.
M. Lerecouvreux	do.	do.
M. Santoni	do.	do.
M. Martin	do.	do.

ADMINISTRATION.

Licenses for the erection and maintenance of ship stations are issued to steamship companies. The form of such licenses and the contract indicating the conditions under which is accorded authorisation to instal wireless telegraphy on board ships will be found below.

The administration of radiotelegraphy is governed by the following enactments, supplemented by a Form of Ship's License :—

- A**—Decree, dated March 5th, 1907 (modified by subsequent enactments).
- B**—Decree, dated February 24th, 1917.
- C**—Decree, dated December 15th, 1917 (modified by Decrees of May 15th, 1919, and March 21st, 1920).
- D**—Form of Ship's license.
- E**—Decree of July 31st, 1919.
- F**—Administrative Order, dated February 27th, 1920, regulating Wireless Time and Meteorological Signals.
- G**—Decree of August 9th, 1920.
- H**—Decree of August 26th, 1920.
- I**—Decree of May 15th, 1921, modifying Articles 3 and 4 of the Decree of February 24th, 1917.
- J**—Decree of June 2nd, 1920, relative to the establishment of private wireless communications.
- K**—Decree of June 18th, 1921, Licenses for experimental, etc., stations.
- L**—Decree of July 5th, 1921, relative to experimental, etc., wireless receiving stations.
- M**—Wireless Telegraphist's (Ship) qualification examinations.

A The following is the Decree dated March 5th, 1907 (modified and completed by the following decrees): April 26th, 1910; February 5th, 1911; May 27th, 1911; November 20th, 1911; July 31st, 1919, which superseded the decrees of February, 1903, and February 27th, 1904 :—

ART. 1.—All wireless telegraph stations in France, in Algeria and in the Colonies are in times of peace worked by the Administration of Posts and Telegraphs with the exception of :—

(a) Coast stations communicating with warships and naval establishments ashore.

(b) Stations on military territory, or engaged solely on military work.

(c) Stations which are purely military in character and which in times of peace are only occupied in periodically exchanging practice telegrams.

(d) Special stations on lighthouses and buoys.

(e) Stations erected for internal communication, either within the boundaries of any one territory, or to communicate between two neighbouring territories, two groups of neighbouring territories, and a colony, or a group of colonies, with a neighbouring foreign country always providing, of course, that for other than local communication (which would be exceptionally allowed).

Questions of contract and tariff would be regulated between the departments concerned (Ministry of the Colonies), Administration of Posts and Telegraphs and, if existing, Ministry of Foreign Affairs.

Any deviation from this rule will form the subject of discussion between the Ministries concerned.

ART. 2.—In the event of mobilisation all radiotelegraphic stations, without exception automatically fall under the authority of the Ministries of War and of the Navy.

In case of mobilisation the Ministries of Marine and War shall automatically assume control of all stations, without exception.

3. The choice of sites for the proposed range of a station and all technical conditions applicable to each projected station shall be submitted for the consideration of an Inter-ministerial Commission formed in accordance with Article 4 of this Decree. The function of this Commission is to study the various aspects of the services to be carried on and to indicate to the Administrative Departments affected the conditions that are necessary to reconcile their respective interests.

4. The Inter-ministerial Commission shall be appointed by the Minister of Public Works, Posts and Telegraphs, and shall comprise the following members :—

One President and one Vice-President appointed by Presidential decree from the Departments interested.

Three representatives from the Ministry of Marine.

Three representatives from the Ministry of War.

Two representatives from the Colonial Office.

One representative from the Foreign Office.

One representative from the Ministry of Commerce and Industry.

Four representatives from the Ministry of Public Works.

Three representatives from the Administration of Posts and Telegraphs.

A secretary who shall belong to the Post and Telegraph Administration. He shall have no voting powers.

5. The Commission shall examine the title to sites and technical conditions appertaining to all stations which shall constitute the French radiotelegraphic network;—examine complaints regarding French stations; consider such administrative problems concerning the radiotelegraphic service as the Ministry of Public Works, Posts and Telegraphs deems fit to submit to it; institute experiments of general interest. The Commission shall be informed through the departments represented thereon of results obtained by various types of apparatus employed at stations in operation.

6. Exclusive of the periods of mobilisation stations established, kept up, and worked by Administrations other than that of Posts and Telegraphs may be open to public service in agreement with this Administration.

7. The Post and Telegraph Administration shall be responsible for all matters concerning the collection and taxes, foreign stations, and the International Bureau at Berne. It shall supervise the administration of international regulations in so far as they concern commercial traffic passing through coast stations in France, Algeria and Tunis, as well as through stations on vessels of the mercantile marine.

8. Licenses to establish private stations shall be granted by the Post and Telegraph administration upon the recommendation of the Commission referred to in Article 4. Such licenses shall only be of a temporary character and the stations are strictly forbidden to interfere with the working of other stations.

9. Cost of experiments carried out on the demand of the Commission are regulated by special credit, negotiated through the budget of the Administration of Posts and Telegraphs.

10. The Ministers of Public Works, of Posts and Telegraphs, of War, of Marine, of Colonies and Foreign Affairs are charged in so far as concerns their respective departments, with the carrying out of this decree.

11. The provisions of the decree of February 7th, 1903, and of the decree of February 27th, 1904, are abrogated.

12. The provisions of Articles 2, 3, 5, 6, 7, and 8 are not applicable to the Colonies as far as local stations, as defined in Paragraph (e) of the 1st Article, are concerned.

The organisation of these stations, in the event of mobilisation, is regulated by Governors General and Governors in agreement with the Departments of War, of the Navy and of Colonies.

The personnel of the Administration of Posts and Telegraphs attached in any Colony to an Inter-Colonial Wireless Telegraph Station, not falling under one of the headings specified in Paragraph 5 of the 1st Article receives its working instructions from the Metropolitan Administration of Posts and Telegraphs.

These instructions are transmitted to it through the intermediary of the Administrative Authority of the Colony, except in case of urgency, and on condition that this authority is advised of them with as little delay as possible.

This personnel is placed, in regard to general discipline, under the surveillance and the

authority of the high functionary who administers the territory in which is located the station. This high functionary gives to the supervised personnel annual notes, a record of which is kept in connection with their advancement.

Modifications other than those connected with the material of the stations, questions concerning the working and general organisation of the service are regulated in agreement with the Metropolitan Administration of Posts and Telegraphs and the Colony.

Colonial Military Stations are under the supreme authority of the respective Governors.

B Decree of February 24th, 1917, relating to the reception and transmission of radiotelegraphic signals.

ART. 1.—Private individuals and corporations are forbidden to establish or make use of telegraphic machinery, or apparatus, or any fittings whatsoever capable of transmitting or receiving signals, without the express authorisation of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs either on French territory or above that territory, or on board French vessels.

The employment on board foreign vessels in French territorial waters of wireless apparatus or installations, is forbidden, except in conformity with the rules laid down by the French Government for the employment of such apparatus and installations in the aforesaid territorial waters.

ART. 2.—Authorisation for the establishment of a transmitting radiotelegraphic station is only granted to private individuals, or corporations, under the proviso that no let or hindrance shall be able to arise therefrom to the detriment of the working of public stations. The Minister, whenever he shall think fit to authorise (after consultation with the Ministers of War and Marine) the establishment of any proposed station, shall lay down the conditions under which that station shall be erected and worked.

ART. 3.—Receiving wireless stations require the same authorisation, under the same conditions as transmitting stations.

It is understood, however, that stations destined for the reception of time and weather signals, whose erection is sought by French citizens, may receive due authorisation by the head of the local Postal and Telegraphic Service (when the latter is asked to do so by the parties interested) under the conditions laid down by a Decree of the Minister for Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (after consultation with the Ministers of War and Marine). Special measures may be carried out under the authority of the Ministers of War and Marine in view of the concession in favour of stations of the kind above mentioned in certain stated districts.

ART. 4.—The royalties due from those who have been granted leave to erect stations are fixed by the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs and worked in consultation with the Minister of Finance.

Stations for the reception of time and weather signals shall be only liable to payment of a fixed royalty of five francs per year per station.

ART. 5.—In times of war—

(a) All private wireless stations, with the exception of those used by, or on behalf of, military authorities must be dismantled. The owners of such stations must remove the antennae, and deposit the essential parts of their sending and receiving apparatus in

places designated for that purpose by the Postal and Telegraphic authorities.

(b) The antennæ of wireless stations of mercantile vessels must be dismantled during the whole of the stay of such vessels in French ports and/or territorial waters, unless they have received special authorisation not to do so from the Naval Authority. Moreover, the Marconi Cabin must be locked up and the key placed in the hands of the master of the vessel. No work (either in the way of overhaul, repair, etc.) may be executed unless the aforementioned officer has assured himself that the work is being carried out by persons authorised to do so.

(c) It is within the option of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (acting after consultation with the Minister of War and Marine), to prohibit for the time being all manufacture, vending or sale of radiotelegraphic apparatus, except under special licence.

ART. 6.—The rules laid down under Chapter V of the Decree-Law dated December 27th, 1851, are applicable to the conditions laid down by the present Decree.

In times of war any representative of the Minister of War, or the Minister of Marine shall be qualified equally with the Minister himself to institute the proceedings provided for in Art. 10 of the aforesaid Decree-Law.

Moreover, in times of war the War Office and Admiralty shall also have power to take the provisional measures laid down in Art. 12 of the Decree-Law of December 27th, 1851, if in their opinion such measures are matters of urgency.

Statements drawn up by officers of the French Forces, either on land or sea shall not require to be taken on oath. They are to be viewed as absolutely reliable unless the contrary shall have been proven.

C Decree of December 15th, 1917 (as modified by Decrees of May 15th, 1919, and March 21st, 1920).

ART. 1.—The Ministers of Commerce, of Industry, of Posts and Telegraphs have appointed an Extra Parliamentary Committee charged :—

(1) With the centralisation and examination of all general questions concerning the establishment of radiotelegraphic services and the exploitation of Inland, Inter-Colonial and International Wireless Telegraphy with the exception of the following :—

(a) The Military and Naval Organisation of the Inter-Allied Services established purely for Military or Naval purposes.

(b) Colonial services organised to ensure internal communications in any particular colony, or between two neighbouring colonies, two neighbouring groups of colonies, and a colony, or a group of colonies with neighbouring foreign countries.

(2) As a result of this examination to prepare on broad lines legislative, or administrative, regulations to be brought into force as soon as possible after the cessation of hostilities, the National Organisation of the Radiotelegraph Service which forms a part of the General Telegraph Service without infringing Art. 2 of the Decree of March 5th, 1907.

ART. 2.—This Commission will be composed as follows :—

Four members of the Senate.

Eight members of the Chamber of Deputies.

Seven representatives of the Ministry of Public Works, i.e. :

(a) Four representatives of the Administration of Posts, Telegraphs and Telephones.

(b) One representative of the Services of Harbours, of the Mercantile Marine and of Fisheries.

(c) One representative of the Service of Lighthouses and Buoys.

(d) One representative of the Services of Civil Aeronautics and Aerial Transport.

Three representatives of the Ministry of War.

Three representatives of the Ministry of Marine.

Three representatives of the Ministry of Colonies.

One representative of the President of the Council.

One representative of the Ministry of Foreign Affairs.

One representative of the Ministry of the Interior (service of public safety).

One representative of the Ministry of Public Instruction.

One representative of the Ministry of Finance.

Two representatives of the Radioelectrical Industry.

One representative of the Staff of the Wireless Service of the Mercantile Marine.

ART. 3.—The Commission formed under the present Decree will be presided over by the Under-Secretary of State for Posts and Telegraphs, assisted by two Vice-Presidents chosen from amongst the Members of Parliament.

ART. 4.—The Members of the Commission will be nominated by a Decree based on the report of the Minister of Posts and Telegraphs, of the Minister of War, of the Minister of Marine, and of the Colonial Minister, after the Head of each of the other Administrations mentioned in Art. 2 above shall have named their representatives to the Minister of Posts and Telegraphs.

ART. 5.—The active Members of the Commission who are bound to be present at a meeting may absent themselves on condition that their place is taken by a member of their same service who will represent them with votive powers.

ART. 6.—All previous regulations on this subject are hereby abrogated.

ART. 7.—The President of the Council, the Minister of War, and the other Ministers interested are charged, in so far as concerns their respective departments, with the carrying out of this decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

FORM OF SHIP'S LICENSE.

FRENCH REPUBLIC.

D MINISTRY OF COMMERCE AND INDUSTRY, POSTS AND TELEGRAPHS.

Office of Control, Telegraphic Administration.

License delivered in accordance with Article IX of the International Radiotelegraphic Convention Service Regulations.

In consideration of the undertaking given by the applicant and the particulars furnished by.....

And in consideration of the arrangements under the Convention and the Radiotelegraphic Regulations as codified in London on July 5th, 1913; and especially of Articles III, VII, VIII, X, XI, XIII, and XVI of the aforesaid Regulations.

And in consideration of the report supplied by the Engineer-in-Charge of the Radiotele-

graphic Service following on his visit to the station on board

Authorisation is hereto given for the installation and maintenance of the radiotelegraphic station on board the which is scheduled under Class

The present license is available for as long as the Radiotelegraphic Convention and Regulations of London remain in force.

Given in Paris on the day of

(Signed) on behalf of the Minister of Commerce, Industry, Posts and Telegraphs by

Chief of the Telegraphic Administration.

UNDERTAKING

GIVEN BY

Who in consideration of an authorisation to instal and maintain a wireless telegraph station on board the s.s. declares himself willing to submit, without reserve, to the clauses and conditions of the agreement whereof the text is herewith subjoined, with the object of obtaining such authorisation for utilising a wireless station on board the s.s.

ART. 1.—The installation of the proposed wireless station shall be submitted to the preliminary approval of the Administration of Posts and Telegraphs. Only apparatus manufactured in France, from materials supplied by builders or manufacturers having their workshops in France, can be employed in the construction of this radiotelegraphic station.

The average range of the station shall be

In the event of its being recognised—in consequence of improvements carried out in radiotelegraphy (affecting range, syntony, wave direction, etc.)—that important modifications can be adopted in the ship's station, the Administration of Posts and Telegraphs reserves to itself the right of providing for the adoption of such improvements.

Every subsequent alteration made to the station must be notified to the Administration of Posts and Telegraphs and receive official approval before its inception.

ART. 2.—..... shall take every care necessary to ensure that the installation, maintenance, and usage of the station, as well as any modifications introduced in accordance with the preceding article, shall be carried out without involving any expense to the Administration of Posts and Telegraphs.

ART. 3.—All contracts, agreements, etc., which have been entered into, or which shall in the future be entered into, between and the manufacturers of wireless apparatus, or which have been or shall be made with wireless companies, for the construction and maintenance of the station, shall—before being put into effect—be submitted for the approval of the Administration of Posts and Telegraphs.

ART. 4.—A charge in favour of the ship's station may be levied on the aforementioned vessel; its amount being fixed by the Administration of Posts and Telegraphs in agreement with This charge shall not be made on official communications of the French Republic.

..... shall be liable to be called upon to place in an office of the Posts and Telegraphs a deposit, by way of guarantee for the charges received on board, and for which he is accountable to the Administration of Posts and Telegraphs.

In the event of the administration of the authorised station being granted to a company, shall remain responsible for the charges received on board.

ART. 5.—All telegraphists entrusted with the manipulation of apparatus must be of French nationality, and subject to the approval of the Administration of Posts and Telegraphs.

ART. 6.—The contents of telegrams transmitted by wireless, which reach the ship's station without being intended for shall not be divulged to any one whatsoever outside the officials appointed by the Administration of Posts and Telegraphs, or the competent officers of judicial police. No use whatsoever may be made thereof.

ART. 7.—The Administration of Posts and Telegraphs may, if it seems good to them, demand at any moment, and on immediate requisition, that the station on board shall be temporarily, or permanently, taken over by State officials. These officials shall be accommodated on board in the class corresponding to their grade. Their messing may be charged for, but not their transport. In such cases the Administration of Posts and Telegraphs shall render account to for the board ship charges due to him after making deduction of cost of upkeep of the station.

In the event of the Administration of Posts and Telegraphs deciding to apply the foregoing provision they may employ wireless telegraphic apparatus of a different type to that utilised by They reserve, moreover, the right, in case of need, of placing such apparatus on board in advance.

ART. 8.—The Administration of Posts and Telegraphs shall exercise in the manner which seems best to them their right of control over the authorised ship's station (installation, transmission, and reception of radiograms, rendering of accounts, etc.).

ART. 9.—The date of the initiation of the service of the ship's station shall be fixed by agreement with the Administration of Posts and Telegraphs.

After the establishment of the installation the apparatus cannot be removed without the express consent in writing of the Administration of Posts and Telegraphs. The apparatus must be continuously maintained ready for use, and must give fifteen days' notice in advance to the Administration of Posts and Telegraphs in the event of his desiring for any reason to cease to use the station.

In the event of the ship's sale, must advise the Administration of Posts and Telegraphs, informing them at the same time of the name and address of the new owner, as well of the arrangements which may have been made (should there be any such) for the closing of the station.

In any event, the aforesaid station cannot be closed down without the express consent in writing of the Administration of Posts and Telegraphs, and the holder of this license shall remain responsible for the charges due until authorisation for transfer has been received.

ART. 10.—The license granted to applies only to the vessel mentioned above. A new license would be necessary, should decide to install a radiotelegraphic station on any other of his ships.

This license can, moreover, be suspended or revoked at any time, and for any reason, without any liability on the part of the Administration of Posts and Telegraphs to pay any indemnity whatsoever, and without any obligation to state the reasons for their decision.

In particular, the license may be revoked in the event of failure by to observe the provisions of the present agreement.

ART. 11.—..... declares that he subscribes to all the legislative arrangements and rules established, or that shall in the future be established, in France with regard to internal and international wireless service.

The wireless station which forms the subject of this license shall exchange radiotelegrams with all the coast or ship stations within the sphere of action of which it shall come without any distinction of the radiotelegraphic system adopted by these stations.

ART. 12.—The State shall not be subject to any responsibility through difficulties which may arise between and private individuals, companies or corporations, to whom authorisation for carrying on wireless telegraph stations may have been granted; or in general with anyone soever or for any reason.

ART. 13.—The stamp duties appertaining to the present license are payable by

Given on the day of

LAW OF JULY 31st, 1919.

E The President of the Council; the Minister of War; the Minister of Marine; the Minister of Public Works, of Transports and of the Mercantile Marine; the Minister of Commerce, of Industries, of Posts and Telegraphs; the Minister of Colonies, having seen the Decree of March 5th, 1907,

Hereby decree :—

ART. 1.—Radiotelegraph Stations joining departments other than the departments of War and of Marine are in times of peace, in view of their utilisation in war time, under the control of a special commission instituted by the Minister of War (General Staff of the Army).

ART. 2.—The Commission is presided over by one of the sub-heads of the General Staff of the Army and comprises a representative of each of the following Ministries: Marine, War, Public Works, and Colonies, as well as of the Administration of Posts and Telegraphs.

These representatives, who are nominally elected by the Administrations which they serve, are in principle the Directors of the Wireless Service in their respective administrations.

Each has an assistant, also nominally elected, and with authority to take the place of the former in case of absence.

An officer of the General Staff of the Army carries out the functions of Secretary, with voting powers.

ART. 3.—The Commission will give its advice on all questions relative to the best means of utilising Radiotelegraph Stations, both fixed and portable in time of war.

It will especially occupy itself with the control of mobilisation of Non-Military Wireless Telegraph Stations, and to investigate experiments of every kind made to improve the utility of wireless in time of war of Non-Military Stations as suggested by the different Ministerial Departments.

ART. 4.—At least once a year, and more often if necessary, the Commission will overhaul Non-Military Stations and their technical equipment, and will also test the professional knowledge of the personnel. Each overhaul will be made by a representative of the Administration working the station and by a representative of the Ministry of War or of the Ministry of Marine according as to whether the station falls under the authority of the one or the other.

The Commission chooses those of its members who will undertake the overhaul, or will ask the departments interested to make the necessary selection from their personnel.

A *procès-verbal* will be prepared after each overhaul and forwarded to the Commission.

ART. 5.—The Commission will transmit its reports and the *procès-verbaux* of its sittings to the Ministers concerned through their representatives. The Ministers will take what steps are necessary in view of these communications.

ART. 6.—In the Colonies the overhaul on Non-Military Stations and of their technical equipment as also that of the professional knowledge of the personnel is carried out according to rules formulated under Articles 3 and 4, by representatives of the departments concerned who are chosen by the Governors-General or Governors.

Reports are transmitted by these High Functionaries to the Department of the Colonies. The latter formulates, if necessary, its observations or propositions.

UNDER SECRETARIATE OF STATE FOR POSTS, TELEGRAPHS AND TELEPHONES.

F ADMINISTRATIVE ORDER OF FEBRUARY 27TH, 1920, REGULATING THE CONCESSION OF WIRELESS TELEGRAPH TIME AND METEOROLOGICAL STATIONS.

The Under-Secretary of State for Posts and Telegraphs, having seen the decree of February 24th, 1917, and in accordance with the advice of the Minister of War and of the Minister of Marine, on the proposal of the Director of the exploitation of Telegraphs,

Enacts :—

The conditions regulating the establishment and use, by private persons, of radiotelegraph stations intended solely for the reception of time signals and meteorological telegrams are fixed as follows :—

ART. 1.—Applications for authorisation must be addressed to the Director of Posts and Telegraphs of the department in which the station is to be installed.

Applicants must indicate the precise place where the station will operate and must furnish a description of the apparatus utilised. They must, if necessary, furnish evidence as to their French nationality.

ART. 2.—Authorisation is granted :—

(a) By the Director of Posts and Telegraphs concerned, when the applicant is of French nationality.

(b) By the Under-Secretary of Posts and Telegraphs to whom the application shall have been forwarded by the Director who will express his opinion, if the applicant be a foreign subject.

Authorisation is moreover subordinated to the opinion of the military authorities (General Commanding the Army Corps) to whose jurisdiction the place in question is subject when the station for which the concession is sought is situated at a point 50 kilometres or less distant from the land frontiers, and to the opinion of the Maritime Authorities (Maritime Prefect) to which the place is subject when the station is situated at a point 50 kilometres or less distant from the maritime frontiers.

ART. 3.—The receiving stations referred to in Article 1 cannot be used for purposes other than the reception of time signals and meteorological telegrams. Any transmission of sign is formally forbidden.

ART. 4.—The contents of radiotelegrams other than meteorological telegrams which might be received by the receiving stations authorised must not be published or divulged to any person whatever excepting to the officials designated by the Administration of Posts and Telegraphs or to the competent officers of the judiciary police. No use shall be made of such telegrams.

ART. 5.—The Administration of Posts and Telegraphs reserves the right to exercise over receiving stations authorised any control that it may deem fit.

ART. 6.—The State shall not be under any responsibility by reason of the utilisation of the wireless telegraph receiving stations for which a concession may have been granted.

ART. 7.—The concessionaries are bound to notify the Directors of Posts and Telegraphs of any change that they propose to make in the installation of their stations.

The Administration of Posts and Telegraphs may, moreover, at any time and for any cause whatever, suspend or revoke the authorisations granted without being called upon to pay any indemnity or to reveal the reasons for its decision.

These authorisations do not carry any privilege and cannot impose any obstacle to the subsequent granting of authorisations of the same character to any other applicant. They cannot be transferred to third parties without the express and written authorisation of the Administration of Posts and Telegraphs.

At the first request of the Administration of Posts and Telegraphs every concessionary shall immediately put his station out of working order.

ART. 8.—The concessionary shall submit to all the regulatory of fiscal provisions resulting from the laws, decrees or regulations which might subsequently intervene as regards the establishment or use of wireless telegraph stations.

ART. 9.—The concessionary shall pay a statistical tax fixed at five francs per year and for each station authorised. This royalty is due for the whole year.

ART. 10.—The stamp dues applicable to documents relative to the authorisation of time stations shall be borne by the applicant.

Paris, February 27th, 1920.

(Signed) Gaston Deschamps.

LAW OF AUGUST 9TH, 1920.

CHAPTER .

G STATIONS FOR THE SERVICE OF AERIAL NAVIGATION.

ART. 1.—The Service of Aerial Navigation installs and exploits all Radioelectric Stations which are necessary to assure the carrying out of the Service and the security of aviators.

ART. 2.—The technical particulars of these stations (location, power, nature of transmission, wavelength, call letters) are arranged between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport.

ART. 3.—If interference is caused by Stations of the Service of Aerial Navigation, or if these are interfered with by foreign stations the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport will agree on the technical means to be employed to avoid such interference.

ART. 4.—Certain stations of the Service of Aerial Navigation may be open to private correspondence by arrangement between the Under-

Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport. In this case the tax payable for each telegram will be established in accordance with the rules in force for radiotelegraphic correspondence with ships at sea.

CHAPTER II.

LAND STATIONS INSTALLED BY PRIVATE COMPANIES.

ART. 5.—Land Radioelectric Stations may be installed by Companies for Aerial Navigation, or by private persons with the object of communicating with aviators or to ensure their safety.

These stations and their personnel will be subject to the rules already issued, or to be issued in the future by the Administration of Posts and Telegraphs, for all private Radio-telegraph Stations.

ART. 6.—Requests for permission to install stations and for licenses for personnel must be sent to the Service of Aerial Navigation. If the latter decides that they are justified by the necessities of aerial traffic, and that they will not compete with its own installations, such requests are forwarded to the Administration of Posts and Telegraphs together with their remarks. If the Administration grants such authorisation this will be made through the Service of Aerial Navigation, who, in turn, will advise the applicant.

ART. 7.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the control and working of stations defined in Article 5. It retains, however, its direct right of control in so far as complaints concerning the stations or the services committed by the latter are concerned. In this case a warning is given to the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of this department may attend the enquiry and give his views. He makes a direct report to his department.

CHAPTER III.

AIRCRAFT STATIONS.

ART. 8.—Aircraft Radioelectric Stations are of two categories those of the first category being utilised both for safety in navigation and for private communication; those of the second category being utilised solely for safety in navigation.

ART. 9.—The installation of all the stations defined in Article 8 and their control are under the same rules which regulate Wireless Stations of the Mercantile Marine.

ART. 10.—The personnel of stations of the first category are subject to the same rules as the Radiotelegraphic personnel of the Mercantile Marine.

ART. 11.—The personnel of stations of the second category must be in possession of a Special License granted by the Under-Secretary of State for Posts and Telegraphs.

ART. 12.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the right to authorise the installation of stations as defined in Article 8, also their control and working with the following exceptions:—

(a) Only apparatus of the type agreed upon by the Under-Secretary of State for Posts and Telegraphs may be authorised, and

(b) The Under-Secretary of State for Posts and Telegraphs exercises his direct right of

control when he receives complaints concerning these stations, or of mistakes committed by them. In this case he warns the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of the latter department may take part in the enquiry and give his views. He makes direct report to his department.

ART. 13.—In order to permit of the control during a flight of Radioelectric Installations, the authority in charge of all aircraft must freely allow representatives of the Administration of Posts and Telegraphs and of the Service of Aerial Navigation to make inspection on board from time to time.

ART. 14.—Requests for authority to install stations on board aircraft must be sent to the Service of Aerial Navigation. It should be stated whether stations of the first or second category are required.

CHAPTER IV.

ART. 15.—The stations mentioned in Articles 5 and 8 are subject to "Subscription" tax for management expenses which the Controlling Company is obliged to pay over to the Treasury. This Subscription Tax is fixed at 200 francs annually per kilowatt and per station, any fraction of a kilowatt being counted as one kilowatt and the minimum amount payable per station being fixed at 200 francs. It is payable to the State on January 1st for a complete year, and is due from the day when the station is put in commission; for the first year the amount is calculated proportionately to the time yet to run before December 31st.

ART. 16.—Any company which benefits under the arrangements of this regulation for a given time will only be taxed for a portion of the aircraft affected. The Under-Secretary of State for Aviation and Aerial Transport will determine the number of the latter; failing the total of aircraft affected the number of them which should come within the scope of this regulation.

ART. 17.—Every time that an aircraft is replaced by another the license granted for the wireless station will be valid for the second machine and a fresh tax will not be payable.

ART. 18.—In all localities where no Radioelectric Station controlled by the Administration of Posts and Telegraphs exists for communication with aviators, the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must receive and transmit gratuitously all Official Government Telegrams, on condition that they emanate from or are destined for aircraft.

ART. 19.—In case of interruption of their radio communication the Service of Aerial Navigation and the Controllers of the Station named in Article 5 are authorised to route their urgent service radio communications through the Administration of Posts and Telegraphs, which will give them priority in transmission.

Reciprocally the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must, in the case of interruption of radio communications of the Administration of Posts and Telegraphs, transmit gratuitously through their stations during the hours at which they are open, official or private telegrams destined for aircraft which may be sent to them by the Telegraphic Offices of this Administration.

ART. 20.—Radio communications relative to the flight and safety of aircraft have priority over those set out in Articles 4, 18, and 19.

ART. 21.—The present law will be deposited with the Under-Secretary of State for Posts and

Telegraphs (Central Service) and with the Under-Secretary of State for Aviation and Aerial Transport for notification to those whom it concerns.

DECREE OF AUGUST 26TH, 1920, FIXING THE TAX FOR RADIOGONIOMETRIC MESSAGES.

ART. 1.—Each Radiogoniometric Message sent by a Land Station at the request of a Mobile Station (Aircraft) will be liable to a fixed Coast Tax of 6 francs.

ART. 2.—Mobile Wireless Stations belonging to the Departments of the Navy and of War (warships and war aircraft) are exempted from the Radiogoniometric tax.

ART. 3.—In accordance with Article 6 of the Law of November 29th, 1850, the State accepts no responsibility in connection with Radiogoniometric Messages.

ART. 4.—The date of the announcement of the application of the tax mentioned in Article 1 will be fixed by a Law of the Under-Secretary of State for Posts and Telegraphs.

ART. 5.—The Minister of Public Works and the Minister of Finance are charged, in so far as they are respectively concerned, with the carrying out of the present Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

DECREE OF MAY 15TH, 1921, MODIFYING ARTICLES 3 AND 4 OF THE DECREE OF FEBRUARY 24TH, 1917, RELATING TO RECEIVING STATIONS.

ART. 1.—The dispositions of Articles 3 and 4 of the Decree of February 24th, 1917, relative to the reception radioelectric signals are modified as follows:—

ART. 3.—Radioelectric receiving stations of all kinds are authorised under the conditions fixed by a special law for each category made by the Under Secretary of State of Posts and Telegraphs after notice due to the ministerial departments interested.

ART. 4.—The royalties payable to the concessionaries of the authorised stations are fixed by the Under Secretary of State of the Posts and Telegraphs by agreement with the Minister of Finance. Stations for the reception of time and meteorological signals and experimental stations are subject to a payment fixed at 10 francs per station per year.

ART. 2.—The Ministries of Public Works, of War, the Navy and Finance are charged etc.

Agreement of June 2nd, 1920, relating to the establishment of private radioelectric communications.

The Under Secretary of State for Posts and Telegraphs.

Considering the decree law of December 27th, 1851, concerning the monopoly and the surveillance of the telegraph lines.

Considering the law of April 5th, 1878, relating to the subscriptions agreed to at reduced prices with regard to telegraphic correspondence.

Considering the decree of May 13th, 1879, relating to the concessions of private telegraph lines.

Considering the decree of February 24th, 1917, relating to the reception of radioelectric messages.

Considering the law of March 29th, 1920, relating to the increase in postal, telegraphic and telephone charges.

Proposed by the Director of Teelgraphic Exploitation.

ORDERS.—The conditions of establishment and use of the radioelectric stations, which, by application of the decree of February 24th, 1917, can be conceded to private individuals, after judgment of the Ministers of War and of Marine relating to the laying of lines of communications serving for the exchange of correspondence of private interest, run as follows—

ART. 1.—The petitioner must inform the Administration of Posts and Telegraphs of the names of the apparatus which he proposes to use, in mentioning their characteristics and origin, as well as an idea of the communication he proposes to carry on.

He must furnish to the Administration in the course of the working of the conceded stations all information which may be demanded of him.

The stations are installed, exploited and maintained by him and at his expense.

All further modifications to these installations must be notified, first of all, to the Administration of Posts and Telegraphs.

The power of the waves issued must be strictly limited to such as to secure good communication. Only such lengths of waves may be used as is arranged by the Administration of Posts and Telegraphs after an understanding with the concessionaires.

ART. 2.—The fees fixed for right of using the private lines and stations, as well as the dispositions relative to this right of use, are applicable to the private radioelectric communications. This right of use is calculated on the basis of the number of stations belonging to one concession and the distance in kilometres, measured as the crow flies, separating two corresponding stations. When one of the stations is working, the distance considered is the average distance to which the communications reach.

The charge for the right of use is payable from the day on which communication starts working. It is calculated for the first year in proportion to the time to run till December 31st; for the following years it is acquired by the State from January 1st for the whole year, and must be paid at the first application of the Administration.

ART. 3.—The conceded radioelectric stations can only be used for the exchange of correspondence to be effected between them.

ART. 4.—The concessionaire must not divulge to any person whomsoever outside the officials appointed by the Administration or competent police officers, the contents of the telegrams or conversations collected by his stations and which may be transmitted by other radioelectric stations.

He must make no use whatever of them.

The concessionaire is responsible for any divulgations which may be made by his agents employed in the service of the conceded stations.

ART. 5.—The transmissions effected by the concessionaire must not disturb those effected by the State for its own uses.

The concessionaire must, at every request of the Administration, cease the transmission effected by his own stations during such time as is demanded.

He has to transmit, whenever required, the official correspondence, giving it priority over

all other telegrams, and to assure of its despatch to the addressee, without any indemnity whatever.

ART. 6.—The Administration of Posts and Telegraphs reserves to itself the right to exercise control over the stations of the concessionaire, either permanent or temporary, as it may see fit, and in the manner in which it may seem to it most suitable. Expenses of every kind which the control should incur, are repayable by the concessionaire on production of the vouchers prepared by the administration of Posts and Telegraphs 48 hours beforehand, his intention to start working his stations. The Administration may, if it recognises the necessity, demand at any moment and at the first application that the stations should be disestablished either temporarily or permanently by its agents.

ART. 7.—The State undertakes no responsibility whatever in consequence of any difficulties which may arise between the concessionaire and private individuals, companies or societies to which authorisation may have been accorded to exploit radioelectric stations or, generally speaking, with whomsoever and for whatever reason it may be.

ART. 8.—The concessions accorded are essentially precarious and revocable. In consequence the Administration of Posts and Telegraphs can, at any time and for any reason whatever, suspend or revoke the authorisations accorded without being called upon to pay any indemnity for whatever cause, nor need it give any notice for its decision.

At the first application of the Administration of Posts and Telegraphs, the concessionaire must place his stations out of working order, either for reception or transmission.

A period of one month may be allowed for the suppression of authorised stations. If this period has lapsed, the Administration of Posts and Telegraphs may proceed on its own account to the operation of such suppression, costs to be paid by the concessionaire.

No radioelectric station which has been conceded may be transferred without the express written consent of the Administration of Posts and Telegraphs.

ART. 9.—The accorded concessions are in the fullest sense subject to all legal enactments, whether executive or administrative, made, or which may be made, on the subject of the exchange of messages by electric waves, of the establishment of radioelectric stations or concessions of private lines and stations, as well as any fees which may be exacted at any time.

ART. 10.—The present order will be lodged at the office of the Under Secretary of State for Posts and Telegraphs (Central Service) to be noted by whom it may concern.

Paris, June 2nd, 1920.

The Under Secretary of State for Posts and Telegraphs.

(Signed)

DESCHAMPS.

LAW OF JUNE 18TH, 1921,

K Fixing the conditions of the establishment and use of transmitting radioelectric stations, which, by the application of the Decree of February 24th, 1917, may be granted for experimental purposes after notice to the Minister of War and the Navy.

ART. 1.—Applications for licenses to be addressed to the Administrator of Posts and Telegraphs.

The applicants must state the precise situation of the station, together with its principal technical characteristics (system of transmission, power, wavelength, etc.), and furnish a diagram of connections of the apparatus as it will be used.

These particulars must be accompanied by full details of the purpose of erection and use, when the applicant proposes to use a power greater than 100 watts and a wavelength of more than 200 metres.

All important modifications of principle which may be made later in the constitution of a licensed station must be notified to the Administrator of Post and Telegraphs who will examine it and make such alterations to the original license as will render it applicable to such modification.

ART. 2.—If there is no objection to the establishment of the projected station the applicant is invited to give under stamp in duplicate an engagement to place himself under the conditions set out by the present law.

ART. 3.—When he is notified that he has been accorded the license, the licensee can proceed to erect his station at his own trouble and expense. The cost of maintenance falling also to him.

ART. 4.—Licenses given do not constitute a privilege or prevent further licenses of the same nature being given later to any applicant whatever. They are not transferable.

The licenses are essentially revocable.

The Administrator of Posts and Telegraphs can at any time and for any reason suspend or revoke licenses given without payment of any indemnity and without giving any reason for this decision to the licensee.

At the first request by the Administrator of Posts and Telegraphs the licensee must immediately put his station out of action. A maximum delay of one month can be given for the definite suppression of the station.

In the case where the licensee does not obey the request of the Administrator of Posts and Telegraphs they can proceed at the cost of the licensee to put out of action and suppress the said station.

The licensee can at any time by his own wish terminate his license. In this case also are applicable the preceding dispositions concerning the putting out of action and dismantling of the station.

The licenses for experimental transmitting stations being given at the holder's risk, the State has no responsibility for difficulties which may arise between the licensee and societies or companies to whom licensees have also been given or in general for any cause or reason whatever.

ART. 5.—The station licensed can only be used for scientific researches or the testing of apparatus, they may not serve in any case to transmit correspondence having a character personal or actual even in the particular or personal interest of the licensee.

ART. 6.—The use by a licensee of a transmitting station with a receiving station attached entails for the licensee the obligation to submit himself to the dispositions and regulations relative to the establishment and use of radio-electric receiving stations and to apply to the Administrator of Posts and Telegraphs for the corresponding license.

ART. 7.—The Administrator of Posts and Telegraphs reserves to itself the right to exercise a control permanent or temporary on licensed stations in any manner which appear to them to be the most convenient.

Moreover, the licensee when he is notified that he has been accorded a license must make the payment given in Article 4 of the Finance Law of July 31st, 1920.

ART. 8.—Licenses granted are subject to all laws, regulations, and legislation which may intervene

L Order, July 5th, 1921, relating to Radio-Electric receiving offices for trials and experiments.

The Under Secretary of State for Posts and Telegraphs.

Considering the decree of February 24th, 1917, relating to the transmission and the receiving of radioelectric signals.

Considering the decree of May 15th, 1921, modifying the foregoing.

Considering the judgment of the Minister of War, the Minister of the Navy, and the Minister of Finance.

On the proposal of the Director of Telegraphic Exploitation.

ORDER.—The conditions of establishments and use by particular individuals of the radio-electric receiving stations designed solely for trials and experiments are ordered as follows—

ART. 1.—The petitions for permission to be addressed to the Administration of Posts and Telegraphs.

The petitioners must make known the precise spot where the station is intended to work, to indicate the principal technical characteristics of such station, and furnish a sketch of the principle of the installation to be realised at the beginning.

All important modifications of such principle introduced subsequently in the construction of the authorised station must be notified to the Administration of Posts and Telegraphs, which will determine whether there are grounds for making the permission already granted applicable to the new installation.

ART. 2.—If nothing is against the establishment of the suggested station, the petitioner is requested to show on stamped paper, in duplicate, an application engaging to submit to such conditions as are foreseen in this order.

ART. 3.—Permission is granted by the Under Secretary of State for Posts and Telegraphs. It is subordinated to the judgment of the Minister of War or the Minister for the Navy according as is the case, when the station for which permission is solicited has to be installed at a distance of 50 kilometres or less from the terrestrial or maritime boundaries.

Should a permission be refused, the Administration of Posts and Telegraphs will not be bound in any case to give any reason for such refusal.

ART. 4.—As soon as the permission has been granted, the concessionaire may proceed with the installation of his station, this installation is made by him and at his own expense. The same obtains afterwards for its upkeep.

ART. 5.—The permissions are granted on essentially precarious and revocable titles. They carry no privileges of any kind, and apply exclusively to authorised concessionaires.

The Administration of Posts and Telegraphs can at any time, and for whatever cause, suspend or revoke the permissions granted without having to pay any indemnity whatever nor having to make known the reason for his decision to the concessionaire.

At the first application of the Administration of Posts and Telegraphs, the concessionaire must immediately put his station out of working order. In such case as their

order has not been obeyed, the Administration of Posts and Telegraphs may proceed to put the station out of working order at the expense of the concessionaire.

ART. 6.—The State incurs no responsibility on account of the use of the stations conceded.

ART. 7.—The radioelectric stations cited above cannot be used except for receiving experiments.

The contents of telegrams of all kinds which may be eventually collected, must not be written down nor made known to anyone whomsoever outside of the officials appointed by the Administration of Posts and Telegraphs or by competent legal police officers. No use whatever shall be made of these telegrams.

ART. 8.—The Administration of Posts and Telegraphs reserves itself the right to exercise such control as it may deem proper over the authorised stations.

ART. 9.—The concessionaire must pay a statistical fee fixed at 10 francs per annum, and for each station authorised. This sum is indivisible, and is due for the whole year.

ART. 10.—The concessions accorded are subject in law to all the decrees of the rules, and regulations which relate to the affair.

ART. 11.—The present order shall be lodged at the Office of the Under Secretary of State for Posts and Telegraphs (Central Service) to be brought to the notice of whom it may concern.

Paris July 6th, 1921.

(Signed)

PAUL LAFFONT.

REPUBLIQUE FRANCAISE.

POSTS AND TELEGRAPHS.

Central Service for Wireless Telegraphy, 5, Rue Froidvaux, Paris 14^e

M Programme defining the terms for admission to employment as a wireless telegraphist on board ship.

I.—EXAMINATION CENTRES.

Examinations are held principally—

1. In Paris, during the second fortnight of February, May, August and November.

2. In Marseilles during the first fortnight of January, April, July and October.

3. In Bordeaux and St. Nazaire in the first fortnight of March, June, September and December.

4. In Boulogne-sur-Mer in July.

The companies working wireless telegraphy and the wireless telegraphy schools are advised in due course of their examinations.

As regards the examinations in Paris, the papers of candidates must reach the Wireless Telegraphy Service, 20 Rue Las Cases, Paris, before February 1st, May 1st, August 1st, and November 1st, which are the latest dates of application.

As regards the Marseilles examinations, before December 17th, March 17th, June 17th, and September 17th, which are the latest dates of application.

As regards the Bordeaux examinations before February 20th, May 20th, August 20th, and November 20th, which are the latest dates of application.

Examinations may be cancelled if the number of candidates entering is insufficient. The candidates interested will be notified of this decision at least five days before the date on which the examination should take place.

II.—DOCUMENTS TO BE SUBMITTED BY THE CANDIDATES.

The wireless candidates must necessarily be of French nationality, and of at least 16 years of age on the day of examination.

With the view of being authorised to enter for examination in respect of professional aptitude, they must, as a matter of principle, produce through the agency of the wireless telegraph Company which is desirous of employing them, the following documents:

1. A request for admission to the examination. The applicants may indicate the type or the types of wireless apparatus used on the French cargo boats on which they wish to be questioned, and to submit to the regulation test, as also the place where the examination is to take place. This document, which must be written entirely in their own hand, is subject to a stamp duty of 2 francs, and must give their full address.

2. They must supply a copy of their birth certificate on stamped paper carrying a minimum tax of 3 francs, and provided by the mayor.

3. A certificate of good conduct and habits and of their French nationality provided by the Mayor or the Commissioner of Police of their neighbourhood. This document must carry a stamp tax of 2 francs.

4. If necessary, a suitable copy on plain paper of their military service and their good conduct certificate in the corps, or, in case of exception or of adjournment, a certificate stating their position from the legal point of view on the question of army recruitment. The candidates who are serving with the colours when they make their application are not obliged to furnish a certificate of good conduct and habits or of their French nationality, as a provisional certificate of good conduct supplied by the competent military authority will take the place of this document.

III.—PROGRAMME AND ORDER OF THE EXAMINATION.

The programme of the examination is based on the wireless rules for London.

It includes—

1. Practical tests in transmission and reception by ear.

2. Regulating tests.

3. A test on the working of apparatus comprising general notions on wireless telegraphy, and more particularly on the wireless system in regard to which the candidate may have asked to be questioned.

4. A test on the wireless telegraphy regulations and on the terms of the telegraphic regulation for Lisbon is so far as they apply to wireless telegrams (R.R. Art. 4).

In order to obtain a first-class certificate the candidates must be capable of transmitting and receiving messages by sound of at least 20 words per minute.

Those who attain a speed in transmission and reception per minute equal to or more than 12 words, but less than 20 words, will only be entitled to a second-class certificate.

Each of the three tests involve the allocation of a scale of 0—20.

The certificates, whether of first or second class, can only be handed to the candidates who may have obtained the note 16 as a minimum for the regulation test, and the note 14 is the minimum for the other tests.

In any case first-class certificates can only be granted to wireless telegraphists who may have reached the age of 18 years.

IV.—PROGRAMME OF WIRELESS EXAMINATIONS.

Theory—General Notions.

Difference of Potential—Electric Current—Ruhmkorff Coil—Transformers—Condensers—

Production of Current—Principle of Batteries and Accumulators—Continuous Current Dynamo—Continuous Motor—Alternators—Transformation of Continuous Current into Alternating Current—Motor Generator Set—Commutator—Principle of Upkeep of Different Apparatus—Danger of High Tension—Physiological Effects—Precautions to be Observed—Measuring Apparatus—Voltmeters—Ammeters.

Wireless Telegraphy.

Electric Oscillations—Why is it necessary to have Rapid Oscillations—Detonators—Part played by the Spark—Part taken by the Capacity—Part taken by Self Induction Coil—Periods of Oscillation—Relation between the number of Oscillations per second and the length of the Wave.

Antenna.

Control—Insulation—Length of Wave proper of the Antenna—How the length of Wave is shortened or lengthened—Junction of the Excitation Circuit and the Antenna Circuit—Diagrammatic Installation of the Emission Circuits—Direct Excitation.

Reception.

Detectors—Part played by Detectors—Diagrammatic Installation of the Reception Circuit.

Syntonisation.

Necessity for harmony between the reception and transmission circuits.

Practical Examination.

Test on the Working of the Station Apparatus—Regulation—Testing for Faults—Starting Apparatus—Methods of Reducing the Wavelength.

V.—TEST ON THE WORKING OF THE APPARATUS.

The regulating exercises and the tests on the working of the apparatus apply to one of the systems used by the French cargo boats. It is essential therefore that the candidates

should arrange beforehand with at least one of the working companies, in order to submit themselves for examination on the type of apparatus which this company uses on board trading vessels.

The candidates must indicate in the application the system on which they desire to be questioned.

VI—ISSUE OF THE CERTIFICATES.

The certificates are issued on a single sheet of paper, and must not be handed over signed to the interested candidates until after having been supplied with a 3-franc stamp (Law of 13 Brumaire, year VII, Art. XIX, and April 20th, 1916, Art. 63).

The certificates are valid for the period during which the Convention and the wireless telegraphy regulation of London remains in force.

They must indicate the system of apparatus in respect of which the candidate has given proof of the necessary knowledge. The wireless operators assigned later to a station using other apparatus must undergo a new test on the working and the regulation of such apparatus (Art. X. of the R.R. of London).

VII.—ADMISSION OF LADIES TO EMPLOYMENT AS WIRELESS OPERATORS ON BOARD SHIP.

Ladies are admitted for examination as to their professional capacity for employment as wireless operators. It is necessary that the parties interested should show the indispensable physical aptitude to stand the life and fatigue of service on board ship.

The candidates must have completed their eighteenth year.

For the present they may only receive the second-class certificate.

NOTE. — The employment of wireless operators on the coastal stations of the Administration of Posts and Telegraphs is reserved exclusively for the agents of this administration.

FRENCH EQUATORIAL AFRICA (French Congo)

(See also Map Section)

Including : Cameroon.

EXTENDING along the Atlantic coast between Cameroon and the Belgian Congo, and excluding the two territories belonging to the Spanish and Portuguese, this colony covers an area of about 982,049 square miles and has a population of about nine millions.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in French Equatorial Africa. A reference, however, is to be found under France and Algeria.

FRENCH GUIANA

(See also Map Section)

SITUATED on the north-east coast of South America this colony has an area of about 32,000 square miles and a population of 49,009. It is administered by a Governor.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in French Guiana. A reference, however, is to be found under France and Algeria.

FRENCH INDIA

(See also Map Section)

THE French possessions in India consist of five dependencies of which Pondichery is the chief. The combined population is 265,200 and the area about 196 square miles.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in French India. A reference, however, is to be found under France and Algeria.

FRENCH INDO-CHINA

(See also Map Section)

Including : Cochinchina, Annam, Cambodia, Tonking, Laos, Kwang-Chau-Wan.

THIS colony consists of five states under a Governor-General. It has an area of about 310,344 square miles and a population of 16,990,229.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in French Indo-China. A reference, however, is to be found under France and Algeria.

FRENCH SETTLEMENTS IN OCEANIA

(See also Map Section)

Including : Society Islands, Marquesas Islands, Tuamotu group, Leeward Islands, Gambier, Tubuai and Rapa Islands, Tahiti.

SCATTERED over a wide area in the Eastern Pacific, these possessions are administered by a Governor with an Administrative Council. The total area of these settlements is about 1,520 square miles and their population about 31,477.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in French Oceania. A reference, however, is to be found under France and Algeria.

FRENCH SOMALI COAST

(See also Map Section)

THIS Colony lies between Eritrea and British Somaliland. It is administered by a Governor, has an area of about 5,790 square miles, and a population of 65,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relative to wireless in French Somali. A reference, however, is to be found under France and Algeria.

FRENCH WEST AFRICA and the Sahara

(See also Map Section)

Including : Wadai, Senegal, French Guinea, Ivory Coast, Dahomey, Colony of French Sudan, Colony of the Upper Volta, Muntania, Togo.

THESE territories are under the administration of a Governor-General, assisted by a Council. The total area is about 1,800,566 square miles, with a population of 12,283,962.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in French West Africa. A reference, however, is to be found under France and Algeria.

FRIENDLY ISLANDS

(See under PACIFIC ISLANDS.)

GAMBIA

(See also Map Section)

Including Bathurst.

THE Colony of the Gambia was created in 1843, after a long history of trading competition in this locality with the Portuguese and French, dating from the time of Queen Elizabeth. Its separate constitution was inaugurated in 1888. The total area of the various islands and mainland adjacent thereto which go to make up the Colony is estimated at 4,130 square miles with a population of 240,000. The chief town is Bathurst, situated on the island of St. Mary, at the mouth of the River Gambia, in $13^{\circ} 24'$ N. latitude. Ruled as a Crown Colony, the administration is vested in a Governor assisted by two councils.

ORGANISATION.

Two wireless telegraph and telephone stations have been established in Gambia, both of which are equipped with Marconi YC 3 installations erected in 1921. They are entirely under the control of the Government and are open for public inland traffic from October to June. Arrangements are in course of preparation to make Bathurst a "shore station." It is hoped to commence communication with ships at the end of 1922.

There are no privately owned wireless stations in the Colony, nor are there any wireless clubs or societies.

ADMINISTRATION.

The rules governing the working of wireless telegraphy in this Colony were originally instituted under the Ordinance (Maintenance of Control) of 12th February, 1903. This has now been repealed and the ruling Ordinance is that of the 22nd of September, 1913, entitled "An Ordinance to provide for the Regulations of Telegraphs." The text will be found below.

A—Ordinance, September 22nd, 1913.

B—Schedule.

C—Rules under 1913 Ordinance.

A I. This Ordinance may be cited as "The Telegraphs Ordinance, 1913."

II. The words "telegraphy" and "telegraph" mean any system used for conveying transmitting or distributing electricity or any like agent for the purpose of communication from one point to another.

The expression "wireless telegraphy," means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

III. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony.

IV. (1) No person shall establish any telegraph station, or install or work any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony except under, and in accordance with, a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period, as the Governor in Council may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

V. (1) If any person establishes a telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to

forfeit any apparatus for telegraphy installed or worked without a license; but no proceedings shall be taken against any person under this section except with the sanction of the Legal Adviser to the Governor.

(2) If the Chief Magistrate, the Police Magistrate, or a Justice of the Peace is satisfied by information on oath that there is reasonable ground for believing that a telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used, or intended to be used, for telegraphy therein.

VI. (1) The Governor in Council may amend, vary or revoke any of the regulations contained in the Schedule to this Ordinance, and may make regulations for all or any of the following matters:—

(i) prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) prescribing the fees payable on the grant of any license;

(iii) prohibiting or regulating the use of telegraphy in such telegraph stations, or of wireless telegraphy on board such ships while in such waters, by such further rules as the Governor-in-Council may see fit to make from time to time, and either in all cases or in such cases as may be deemed desirable, if at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over telegraph stations or over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony.

(2) Provided that no regulations made in respect of the provisions in this section contained shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

VII. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

VIII. (1) Every omission or neglect to comply with, and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder, or in breach of the conditions and restrictions subject to, or upon, which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding fifty pounds or to imprisonment with or without hard labour for a term not exceeding six months.

(2) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a Court of Petty Sessions.

IX. Nothing in this Ordinance contained shall invalidate or impair any agreement now in force entered into between the Governor of

this Colony, or the Imperial Government on behalf of the Government of this Colony, and any telegraph company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance and use thereof, or to the payment of any subsidy to such company by the Government of this Colony or any other like matter.

X. Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

XI. The Telegraphic Establishments (Maintenance of Control) Ordinance 1903 is hereby repealed.

To this Ordinance is attached a Schedule which runs:—

THE SCHEDULE.

B 1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, or in the Protectorate, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, shall be worked or used whilst such ship is in any of the harbours of the Colony or Protectorate except with the special or general permission of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

* * *

It will be noted that under Section VI of this Ordinance the Governor-in-Council has power to make regulations. Of those which His Excellency has accordingly promulgated under date of the 28th January, 1914, the text runs as follows:—

RULES MADE BY THE GOVERNOR-IN-COUNCIL UNDER SECTION VI OF THE TELEGRAPHS ORDINANCE, 1913.

C 1. These rules may be cited for all purposes as "The Telegraph Rules, 1914."

2. The expression "the Company" shall mean any company, corporation or person for the time being engaged in the Colony or Protectorate of the Gambia in transmitting or receiving telegrams.

3. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony and Protectorate of the Gambia shall have control over the transmission of telegrams by the Company, it shall be lawful for the Governor by warrant under his hand to direct and authorise such persons as he may think fit to assume the control of the transmission of telegrams by the Company either wholly or partly and in such manner as he may direct, and such persons may enter upon the Company's premises

accordingly or the Governor may direct the Company to submit to him or any person authorised by him all telegrams tendered for transmission or received by the Company or any class or classes of such telegrams, and to stop or delay the transmission of any telegrams or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of telegrams as the Governor may prescribe, and the Company shall obey and conform to all such directions.

Provided always that if default shall be made by the Company in the observance or performance of any provision hereinbefore contained it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the Company's works as are in the Colony or Protectorate of the Gambia or any part of such works to be taken possession of for such services as to the Governor may seem fit, and in that event any person authorised by the Governor may enter upon the offices and works of the Company or any of them and take possession thereof and use the same as aforesaid. Nothing herein contained shall be deemed in any way to prejudice or abridge the power of the Government of the Colony and Protectorate of the Gambia to take possession under or by virtue of any agreement for the time being in force.

4. In any such case as aforesaid if the Company show that during the exercise of any of the powers aforesaid their receipts from the telegraphs with respect to which the said powers have been exercised have been less than their receipts from the same source during a corresponding period on the average

of the last three years preceding the Government of the Colony and Protectorate of the Gambia shall pay to the Company as compensation for any loss of profit sustained by the Company by reason of the exercise by the Governor of any of the powers hereby reserved such sum as may be settled between the Governor and the Company by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Governor are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and save with the consent of the Governor no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing indirect suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

5. In estimating such compensation as in the preceding section provided the Arbitrator shall take into account all the circumstances of the case, including not only any such loss as aforesaid but also any additional profit accruing to the Company from the emergency which gave rise to the exercise of the powers aforesaid, and as regards the telegraphs with respect to which the said powers have been exercised the receipts of the Company on the average of the last preceding three years during a period corresponding to that of the exercise of the said powers shall be deemed to be the receipts which the Company would have taken during the period of the exercise of the said powers had the powers not been exercised.

GEORGIA

(See also Map Section)

THIS Republic has only recently gained its independence, and lies in the mountainous region of the Caucasus. It possesses in Batum its outlet to the world through the Black Sea. The area of this Republic is 74,577 versts, with a population of 3,053,345.

CONTROL.

Wireless Telegraphy constitutes a State monopoly, and is under the control of the War Office.

ORGANISATION.

The first wireless station on Georgian territory was erected during the war in 1914 for the use of the Caucasian Army which was fighting on the Turkish front. The following stations are those now existing: Tiflis, Batum and Poti.

Great improvement was made in the wireless services in 1918, when Germany recognised the independence of Georgia and a small Expeditionary German Corps was sent to the Republic. The Germans maintained a wireless service between Tiflis and Berlin by means of several ships on the Black Sea through Batum and Constanza (Roumania).

At the present time there is a very powerful station at Tiflis which was improved by the Italians. The Director of this station is Prince A. Andronikashvili and there are six other officials.

During the last months of 1920 the Georgian Government concluded an agreement with some French companies to erect four wireless stations in various parts of Georgia; these new stations will connect Georgia with large European centres, such as Paris, London, Rome, Moscow, etc. The central wireless station will be erected in Tiflis.

No other classes of wireless stations exist, but Government stations are used for commercial purposes and also for communicating with aircraft.

The employees of the wireless station have to pass a special examination, and a certificate is issued to them to that effect. No amateurs are admitted to it.

The Tiflis Wireless Station receives and despatches messages to and from Moscow, Basra and Constantinople, thereby acting as a relay station between these points. There is also one British Light Cruiser, one Italian Destroyer, and one American Destroyer at Batum, which have wireless installation and work in conjunction with the Georgian Central Station in Tiflis.

ADMINISTRATION.

No special laws exist yet, although they are now receiving consideration.

GERMANY

(See also Map Section)

Including: The States of Anhalt, Baden, Bavaria, Bremen, Brunswick, Hamburg, Hesse, Lippe, Lübeck, Mecklenburg-Schwerin, Mecklenburg-Strelitz, Oldenburg, Prussia, Saxony, Schaumburg-Lippe, Thuringia, Waldeck, Wurtemberg.

THIS republic was founded on November 9th, 1919, with a President at its head, from the then existing German Empire. It is situated in the heart of Europe. The total area is about 250,471 square miles with a population of 59,857,283.

CONTROL.

In Germany, wireless telegraphy, like ordinary line telegraphy and the telephone system, is a monopoly of the State. The exercise of the monopoly is entrusted to the Imperial Postal Administration, within whose purview is also included the management of the entire postal system. The Imperial Postmaster-General is at the head of the Imperial Postal Administration. The Departments II, IIa, V and Va in the Imperial Postal Administration are charged with the direction of line, telephone and wireless matters. The direction of these departments, and consequently of the entire telegraph, telephone and wireless system, is placed in the hands of the Secretary of State. Of these departments the Department V attends exclusively to matters relating to the wireless telegraphic system, and this department directs particularly the fundamental questions of equipment, administration, communication and management. The technical matters in wireless telegraphy and the construction and working of wireless telegraphy installations, belong to the business side of the Wireless Department (IV) of the Imperial Telegraphs Technical Department, which is directly under the Imperial Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Giesberts	Minister of Posts	Berlin.
Dr. Engineer h.c. Hans Bredow ..	Secretary of State	Berlin.

ORGANISATION.

Wireless telegraphy, after having demonstrated its serviceability as the result of trials, was brought into the service of general public communication as early as the year 1900, by the utilisation of the coast wireless station on the Island of Borkum. Since then the practical use of wireless telegraphy, which has kept pace with technical development, has been advanced to such a degree that on the outbreak of the world war there were in Germany and in countries under German protection 26 coast stations and over 600 ship

stations, in addition to numerous testing stations. There further existed the high-power wireless stations of Nauen and Eilvese for traffic with America and with the high-power stations of Kamina (Togoland) and Windhuk (South-West Africa), as well as the wireless stations at Tsingtau, Yap, Nauru, Rabaul, and Apia.

The wireless traffic of Germany is organised as follows :—

1. WORLD TRAFFIC.

Wireless traffic with overseas countries is carried on by the long range stations of Nauen and Eilvese, which stations make possible general public communication with the United States of America (central radio corresponding stations, Rocky Point and Marion, and, in the event of breakdowns, New Brunswick and Tuckerton) and beyond (Central and South America and Asia), whilst the forwarding of press telegrams to these countries falls on the long range station of Eilvese alone. The chief wireless station of Königs Wusterhausen (near Berlin) is used generally for traffic with European countries, and makes possible traffic with :—

Great Britain	(corresponding station, London).
Hungary	(corresponding station, Buda Pesth).
Bulgaria	(corresponding station, Sofia).
Serb, Croat, and	
Slovene	(corresponding station, Sarajevo).
Norway	(corresponding station, Christiania).
Sweden	(corresponding station, Karlsborg).

Communication with Italy (corresponding station San Paolo, Rome), with Roumania (corresponding station Bukharest and Oradeamare), with Russia (corresponding station Moscow), and with Spain (corresponding station Aranjuez) is carried out from Nauen.

Traffic with the Netherlands (corresponding station, Rotterdam) is conducted through the wireless station at Hamburg.

The large wireless station at Nauen is the property of the limited liability company, " Drahtloser Uebersee-Verkehr " (Transradio); the large wireless station at Eilvese is the property of the Eilvese G.m.b.H., and both the wireless stations are, under superintendence of the State, worked by the limited liability company, " Drahtloser Uebersee-Verkehr " (Transradio). Königs Wusterhausen is the property of the Imperial Telegraphs Administration, and is worked by it. It is worked in accordance with the rules laid down by the International Telegraphs Agreement, and the present executive arrangement, but telegraphed postal orders are not conveyed by wireless. For communication with European countries the rates for transmission by wireless and by ordinary telegraphy are the same. The German Telegraphs Administration therefore reserves itself full choice, as a rule, of the method to be adopted (wireless or wired telegraphy) for clearing traffic with these countries. If, however, the sender of the telegram is afraid of unauthorised persons listening, which, owing to the peculiarities of wireless telegraphy, is not entirely impossible, and therefore expressly desires the message to be forwarded on the wires, he must write in the space provided on the telegraph form for the route the word " fil," in accordance with the resolutions of the European Communications Conference held at Paris in July, 1920.

For overseas traffic the rates for wireless are lower than those for cabled telegraphy; the route to be followed must therefore be shown by the sender.

The high-power wireless station of Nauen possesses, in addition to a musical note transmitter, high frequency machines of the system of Count Arco; Eilvese is fitted with high frequency machines of the Goldschmidt system; Königs Wusterhausen has undamped apparatus including a 32 kW and a 10 kW Lorenz transmitter (Poulsen arc) and a 10 kW valve transmitter.

Since the traffic performed by the three wireless stations is not yet internationally regulated, they have not yet been shown in the official list of radiotelegraph stations, etc.

2. SHIP TRAFFIC.

For the purposes of traffic with ships at sea, 23 coastal stations are at present in operation. They are as follows:—

- (a) Open for public service: Cuxhaven, Heligoland, Norddeich and Swinemünde.
- (b) For restricted public service: Borkum F.S. (Funkenstelle—wireless station), Bremerhaven Lloydhalle, Bülk F.S., List F.S., Nordholz F.S., Pillau F.S., Sassnitz, Wilhelmshaven III, Einfahrt F.S., and the light ships *Adlergrund*, *Amrunbank*, *Aussenjade*, *Borkum Riff*, *Eider*, *Eiderlotsengaliote*, *Elbe Eins*, *Fehmarnbelt* and *Weser*.
- (c) For Naval service traffic only: Stolpmünde F.S. and Warnemünde F.S.

Of German ships 455 vessels are at present fitted with wireless stations, namely, 322 merchant ships and 133 naval vessels.

The working of the coastal and ship stations, as well as that of ship stations between themselves, is performed in accordance with the provisions of the International Radiotelegraph Convention (London, 5th July, 1912), and the Service Regulations annexed thereto, as well as the "Anweisung für den Funkentelegraphendienst vom 15th June, 1913" (instructions regarding the Radiotelegraph Service of the 15th June, 1913), which was issued for Germany in accordance with the provisions of the International Convention.

Ship radiotelegraph stations may only be installed and worked on German ships with the approval of the State.

3. IMPERIAL WIRELESS SERVICE.

The Imperial Wireless system in course of construction is to be used for inland wireless traffic. It is destined to supplement and relieve the interior telegraph system, and consists at present of the head wireless station at Berlin and the leading district wireless stations of Dortmund, Frankfurt Main, Hamburg, Hannover, Königsberg (Prussia), Leipzig, München (Munich) and Stuttgart, and the wireless stations of Bremen, Breslau, Darmstadt, Dresden, Elbing, Erfurt, Friedrichshaven, Konstanz and Stettin. The leading wireless station of Dortmund also handles traffic with Rotterdam.

The principal wireless stations and the wireless stations at Breslau, Dresden, Elbing and Erfurt, communicate direct with the chief wireless station in Berlin. Besides this there are the following wireless connections, namely: Leipzig-Darmstadt, Friedrichshaven-Stuttgart, Constance-Frankfurt a/M., Bremen-Hannover and Stettin-Hamburg.

The Imperial wireless system has also recently been utilised for the transmission of a new sort of telegraphic messages requiring a quite specially rapid delivery—the so-called "lightning wireless telegrams." By means of these telegrams, the time which elapses between the handing in of the message and its delivery to the addressee is confined within the utmost limits. In order to attain this aim the greatest length of such a telegram has been fixed at 30 words. The telegrams are transmitted by the operator of the receiving office by telephone, or are handed over the counter of the corresponding telegraphic office, from whence, until they reach their destination, the messages are transmitted almost exclusively by wireless telegraphy, and they are conveyed to the addressee at the point of destination by means of the telephone. At the present moment the following take part in this service, namely, the chief wireless station in Berlin, the principal wireless station at Dortmund, Frankfurt a/M., Hamburg, Königsberg in Prussia, Leipzig, Munich and Stuttgart, and the wireless stations in Bremen, Breslau, Darmstadt, Dresden, Elbing, Friedrichshaven, Constance and Stettin. Düsseldorf, Elberfeld and Barmen, as also 28 other places in the lower Rhine, Westphalian industrial district, are also connected with the lightning wireless service through the principal wireless stations at Dortmund; through the principal wireless station at Leipzig, Chemnitz, through Düsseldorf, Goch,

and through Hamburg, Flensburg, Harburg (Elbe), Kiel and Lübeck. The inclusion of further principal and other wireless stations is under consideration.

For the purposes of transmission only valve transmitters are used, and owing to their great sharpness of tuning, a fairly close disposition of the transmission wavelengths is possible. For the Imperial wireless network the wavelengths used are between 1,000 and 3,000 metres, with the exception of some of the lesser ones, which are reserved for international sea traffic, and naval and air purposes.

The exchange of wireless telegrams is in recent times effected mainly by duplex working.

The publication of the chief district wireless stations (*Leitfunkstellen*) and ordinary wireless stations (*Funkstellen*) in the "*Nomenclature Officielle des stations radiotélégraphiques*," etc., has not been effected.

4. CIRCULAR (*i.e.*, Broadcasted) WIRELESS NEWS.

(a) *Circular Wireless Service*.—For the reception of circular wireless news there exists at present a system of 75 official circular wireless receiving stations. The news received for publication is transmitted by wireless telegraphy to the circular wireless receiving stations, and are conveyed to the interested parties either by telephone or by means of messengers.

(b) *European Radio Service*.—A similar circular wireless service was introduced a short time ago by way of experiment under the name of "*Europaradio*." The financial news received for distribution by means of this service is transmitted by the Eildienst G.m.b.H. At the present moment the transmission of the message is made through the large wireless station at Nauen. At present Austria, Hungary, Norway and Czechoslovakia participate in the reception of the news, and the extension of the service to a number of other countries is in contemplation.

(c) *European Press Service*.—The large wireless station at Eilvese transmits twice daily, namely, at 11 a.m. and 8 p.m. (middle European time), 500 words of press news at each hour, such news being intended for despatch to European countries.

(d) *Overseas Press Service*.—From the wireless station at Nauen some 500 words of press news are transmitted daily from 12.30 until 2 p.m. (middle European time) intended for despatch to overseas countries.

The news under (c) and (d) is delivered by the "*Transocean G.m.b.H.*"

(e) *Circular Telephone Service*.—Financial news is distributed by this service to private subscribers by a central station, namely, the Eildienst Gesellschaft of Bunsenstrasse No. 2, Berlin. The work of transmission is carried out in the following manner, that is to say, that the most important financial news arriving at the premises of the Eildienst Co. from all parts of the world, mostly by means of wireless telegraphy, is collected and repeated immediately into a microphone machine installed there. The microphone is in direct communication, by means of a special conductor, with the chief wireless station at Königs Wusterhausen, and automatically sets a wireless telephone transmitter in operation, so that by this means the verbal news is distributed from Berlin right throughout Germany. The right of receiving the news and of installing a wireless receiving apparatus may be obtained by each subscriber to the Eildienst Co. by payment of a fee accruing to the Imperial Post Office. Some 600 firms, situated in more than 150 different places, have already subscribed to this service. Preparations for the communication of interesting and instructive news, as also for the transmission of musical performances by the same means, are already so far advanced that the establishment of this service may very shortly be inaugurated.

5. SPECIAL TRAFFIC.

(a) *Radio Direction Finding Service*.

(See Direction Finding Section)

(b) *Time Signal Service.*

(See Meteorological, etc., Section)

(c) *Radio Meteorological Service.*

(See Meteorological, etc., Section)

ADMINISTRATION.

For some time past licenses have also been given for the erection and working of private wireless installations in which are distinguished "Experimental installations for sending and receiving," "Experimental installations for receiving," "Installations for the reception of the Nauen time signal" and "Wireless Working installations (Sending and Receiving installations) for overland power stations, water works, etc." The conditions in which they are approved will be determined more precisely in accordance with the special circumstances of each case.

The conditions upon which such approval is dependent for the installation and working of a ship's wireless station are shown below. They correspond with a portion of "Anweisung für den Funkentelegraphendienst."

With regard to the division of ship stations (Article XIII of the Service Regulations annexed to the International Radiotelegraph Convention) into categories, the following provisions apply in Germany:—

- (1) To the 1st Category (stations with continuous service): belong the wireless stations—
 - (a) On all passenger steamers in the Transatlantic service to America.
 - (b) On all passenger steamers with a gross carrying capacity of not less than 6,000 tons and a speed of not less than 14 knots.
 - (c) On all passenger steamers (with the exception of those included under (a) and (b), having on board 1,000 or more persons (without crew and deck passengers).
- (2) In the second category (stations with restricted working hours) will be comprised: the ship stations on all other passenger vessels not included from 1a to c.
- (3) In the third category (stations without fixed working hours) will be included: the ship stations on all cargo stations.

The carrying out of the wireless service on ships is regulated in the following manner:—

- (1) Ships having a wireless station of the 1st Category must have on board at least two first class telegraphists.
- (2) Ships having a wireless station of the 2nd Category must have one telegraphist of the 1st Class and at least a second man who is competent to maintain listening service for the first ten minutes of each hour outside the regular hours of service.
- (3) Ships having a wireless station of the 3rd Category must have one telegraphist of the 2nd Class.

New regulations having as their object the regulating of the equipment of ships with wireless apparatus and their manipulation by wireless telegraphists in accordance with the International efforts for the protection of human life at sea, are in course of preparation.

The use of telegraph installations on foreign vessels for navigation at sea and for inland navigation, within German territorial waters, is regulated on the basis of paragraph 3b of the Telegraph Law of the 6.4.92/7.3.08, by the provisions set forth below.

The present Wireless Laws and Regulations appear in accordance with the following list:—

- A—Telegraph Law of the German Empire, March 7th, 1908.
- B—Regulations (Foreign Ships).
- C—Conditions of Concession (Ship Stations).
- D—License for Aeroplane Wireless Installations.
- E—Conditions for the Installing and Working of Wireless Stations for Experimental Purposes,
- F—Conditions for Experimental Wireless Receiving Installations.
- G—Conditions for Wireless Receiving Installation for the reception of NAUEN time signals.
- H—Conditions for the Erection and Working of Wireless Stations (Transmitting and Receiving Stations) for Overland Power Stations, Waterworks, etc.

A *Sole Article.*—The Act of April 6th, 1892, relating to telegraphs in the German Empire is modified as follows:—

1. Article 3 is completed by the following paragraph (2):—

Installations of electric telegraphs for transmission of messages without the aid of metallic wires of junction shall not be established and worked, except with the authorisation of the State.

2. The following provisions are inserted after Article 3:—

(3a) Telegraphic installations which are not exclusively designed for the internal service of a ship cannot be established and worked on German vessels unless authorised by the State.

(3b) The Imperial Chancellor shall decree the regulations concerning the working of telegraph stations on board foreign vessels in German territorial waters.

3. Article 7 is completed by the following paragraph (2):—

The provision of Paragraph 1, Phrase 1, does not apply till July 1st, 1913, to installations of the nature defined in Article 3, Paragraph 2.

B The following regulations are decreed for the working of telegraphic installations on board foreign ships in German territorial waters, and are founded on Article 3 (b) of the "Telegraph Law of the German Empire," of April 6th 1892, and March 7th, 1908, and under the reservation of Article 15 of this law:—

1. Ships of war are authorised, in a general manner—

(a) To exchange messages, signals, by means of optic and acoustic signals, submarine acoustic signalling excepted.

(b) To use wireless telegraphy, on condition that they do not disturb the radiotelegraphic service of the public coast stations, or the service of the coast or ship stations of the Imperial Navy.

In exchanging messages with German or foreign radiotelegraphic stations, foreign vessels must conform to the regulations of the "Decree for the Regulation of the Radiotelegraphic Service" and to the Decrees which may ultimately be promulgated.

2. Foreign vessels other than ships of war are authorised—till otherwise decreed—

(a) To exchange messages by means of optic and acoustic signals, submarine acoustic signalling excepted, and under the reservation that within the illumination zone of the navigable waters of the German

coasts and islands the lights of the signal protectors or lanterns must not exceed that prescribed for fixed lights.

(b) To use wireless telegraphy in conformity with the provisions of the "Decree Regulating the Radiotelegraphic Service" and the decrees which may ultimately be promulgated; nevertheless, in the ports, roadsteads, and estuaries, and in the navigable waterways of the interior, wireless telegraphy can only be used on an authorisation being granted in writing by the Ministry of Posts and Telegraphs of the German Empire.

3. In the public interest the Articles 1 and 2 may be temporarily restricted or suspended.

4. Whosoever works telegraphic installations in a way not authorised by the preceding provisions is liable to fines determined in Article 9 of the "Law of Telegraphs," and in virtue of Article 40 of the Penal Code of the German Empire all the apparatus designed for the transmission of wireless messages can be confiscated. Moreover, installations which have been worked without a license can be, in conformity with Article 11 of the "Telegraph Law," removed or rendered unserviceable.

C The following are some of the principal conditions on which the concession for the installation and working of a radiotelegraph station on board ship is granted —

1. The concession for the installation and working of the ship station may be withdrawn at any time.

2. The station must fulfil the following requirements:—

(a) The construction of the station must be in accordance with modern developments of science and technology.

(b) The ship station must be equipped in such a way as to be able to use the two wavelengths of 600 and 300 metres.

(c) The waves must be as pure and little damped as possible. The use of sending arrangements with which the production of the emitted waves takes place by direct sparking discharges of the antenna is not permitted, except in cases of distress. However, it may be allowed for certain special stations—e.g., for such on small ships—the primary energy of which does not exceed 50 watts.

(d) The power transmitted by the radiotelegraphic apparatus, measured at the terminals of the generator, must not under normal conditions exceed one kilowatt.

(e) With the reservation of the special provisions concerning the application of the 1,800 m. wave, a power of more than one kilowatt may be used if the ship must maintain communication over a distance exceeding 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be maintained except by means of an increase of power.

(f) The apparatus must be suitable for transmitting and receiving at a speed of at least 20 words per minute, five letters being counted as one word. Installations working with more than 50 watts must be equipped so as to be able to cover several distances within the normal range of transmission, the shortest of which shall be about 15 nautical miles.

(g) The receiving apparatus must be capable of reception up to 600 miles with the greatest possible protection against disturbances.

3. Ships belonging to the first two categories stated under Article 8, in addition to the ordinary apparatus, must be equipped with emergency gear having an independent source of power and capable of working for at least six hours, with a minimum range of 80 nautical miles in the case of ships in the first category, and of 50 nautical miles of those of the second category. The emergency gear is not necessary in the case of ships whose ordinary plant fulfils the conditions for emergency sets.

The emergency gear, as well as the ship stations themselves, must be placed as high as possible above the deck—viz., according to the structure of the ship and the available space, either equal to the height of the bridge or of the large boat deck, so that in case of accident they shall be able to remain longest above the water. When using batteries for the emergency plants accumulators may be arranged in the station room itself, whilst acid accumulators, on account of the vapours which they develop, must be placed outside the station room, but in its immediate vicinity and so that they are protected against outside influences.

4. The contractor must submit to the Imperial Telegraph Administration a description of the ship station, together with a plan of the circuits. Subsequent alterations of the technical equipment affecting transmission or reception must not be made without the consent of the Imperial Telegraph Administration.

5. In order to examine the prescribed arrangement of the ship's station, and the carrying out of the service, the officers of the Imperial Telegraph Administration are permitted at any time to enter the rooms where the apparatus is installed, and to inspect the working equipments.

6. The radiotelegraph service on the ship must be operated only by German subjects.

7. The service of the ship station must be carried out by an operator holding a certificate issued by the Imperial Telegraph Administration, or in an emergency, and for one journey only, by another Government which is a party to the International Radiotelegraphic Convention.

There are two classes of certificates.

The first-class certificate for the capability of the operator, with regard to:—

(a) The adjustment of the apparatus and knowledge of the methods of working.

(b) Transmitting of telegrams and receiving by sound at a speed of at least 20 words per minute.

(c) Knowledge of the regulations applying to the exchange of radiotelegraphic communication.

The second-class certificate may be issued to an operator who attains in transmitting and receiving a speed of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Operators holding a second-class certificate may be admitted:—

(a) On ships which use radiotelegraphy for their own service only and for the exchange of messages of the crew, in particular on fishing vessels.

(b) On all ships as junior operators, provided that such ships have on board at least one operator holding the first-class certificate. Nevertheless on ships placed in the first category mentioned in Article 8 the service must be carried on by at least two operators holding the first-class certificate.

Transmission may be made only by an operator holding either the first or second-class certificate, except in cases of emergency.

8. Ship stations are placed in three categories:

(1) Stations always open.

(2) Stations having limited working hours.

(3) Stations having no fixed working hours.

During navigation the following must remain permanently on the watch:—

(1) The stations of the first category.

(2) Those of the second category during the hours that they are open for service; out of these hours these stations must remain on the watch for the first ten minutes of each hour.

The stations of the third category are not bound to perform any regular "listening" service.

9. The ship station operator is under the supreme authority of the captain or of the captain's representative, who, in his capacity as superintendent of the ship station, is entitled to note the contents of all telegrams provided he has been placed by the Imperial Telegraph Administration, or, in the case of ships that are permanently abroad, by a German Consulate (General or Vice-consulate), under the obligation of preserving the secrecy of correspondence.

10. The certificate may be withdrawn if, in the case of any offences against the "Regulations for the Radiotelegraph Service," the operator has been found guilty after an inquiry.

11. If it is shown that the offence is due to the condition of the apparatus or to instructions given to the operator, the same procedure will be followed in respect of the license issued to the ship.

12. The certificate may also be withdrawn if it is stated by an officer of the Imperial Telegraph Administration that the operator is no more in possession of the prescribed knowledge and skill. In the latter case a certificate will be granted to the operator after he has successfully passed a further examination.

13. Every change in the staff of the ship station must be reported immediately to the local post office of the home port.

14. The ship station is bound to interchange radiotelegrams with every coast station and with every other ship station, without regard to the particular system of radiotelegraphy employed.

15. The Radiotelegraph Service is regulated in accordance with the rules in the "Instructions for the Radiotelegraph Service." In addition, special instructions which may be issued by the Imperial Telegraph Administration must be observed also.

22. The ship station must be in possession of the certificate from the Imperial Telegraph Administration, stating that the installation and the working of the station have been licensed by the authority named and the category in which the station is placed. This certificate must be kept in the station and presented upon the request of the authorities of the countries at the ports at which the ship calls.

23. If _____ transfers the service of the ship wireless station to a contractor it is incumbent on _____ that the conditions laid down are fulfilled by the contractor.

Place
Date

(Signature)

CONDITIONS FOR THE FITTING AND WORKING OF WIRELESS INSTALLATIONS ON AEROPLANES.

D 1. The license for the installation and working of the wireless plant on _____

is granted on the understanding that it may be revoked. The transfer of the license to other parties is prohibited.

2. The plant must, as a rule, only work in connection with the nearest wireless installation intended for the air-service for the exchange of news which concern the working and the safety of aircraft. The transmission of other news is not permitted, whether paid for or gratuitously. In the case of need the aircraft is permitted to get into communication with other wireless-stations. In such an event the general emergency signal ••••—•••• must be used.

3. In sending messages only such energy must be used as is absolutely necessary for giving effect to the object in view.

4. The plant must only be worked by the use of a definitely prescribed wave. This wave must be undamped and as sharply timed as is practicable in the present state of wireless technology. The waves of 300, 450 and 600 metres reserved for purposes of general communication may only be employed in cases of emergency.

5. Transmission limitations and circular working regulations (for example, wave distribution, call signals, apportionment of time, etc.) are given in a separate appendix, and are to be adhered to with exactitude.

6. General public communication as well as the working of the wireless stations of the army and of the navy must not be interfered with.

7. A notice regarding the terms of working of the installed plant is attached to the license contract, and is to be observed by the owner of the plant. The plant may be only erected and worked in accordance with the terms of this notice. Any departures from the terms of the notice require the consent of the Ministry of Posts and Telegraphs of the State;

8. For purposes of superintendence the official appointed by the Imperial Telegraph Administration is to be permitted to inspect the aircraft at the landing places, and to satisfy himself as to the arrangements made for giving effect to the wireless working.

9. The owner of the plant is unreservedly obliged, under full responsibility, to see that any messages received by the plant from other wireless installations are kept secret under all circumstances, and no use made of them.

10. The owner of the plant is responsible for any damage which may result from the working of the plant in the measure of the legal enactments appertaining to the subject. He is also responsible for the safeguarding of the plant, and for preventing its use by unauthorised persons.

11. Immediate compliance with the demand of the Telegraph Administration of the State, as well as that of its authorised officials, for temporary suspension for working the plant, is stipulated. In this connection the working arrangements (apparatus, antennae, etc.), or any portion of them, are to be so dealt with during this period that use of the plant is made impossible. The decision in this matter is in the province of the Telegraph Administration of the State.

12. The owner of the plant undertakes to pay an annual fee of _____ m to the Administration of the Posts and Telegraphs of the State.

13. Amplification or amendment of the conditions set forth above is expressly reserved. The owner of the plant is under obligation to give effect without delay and at his own charges, to any further condition laid down by the Telegraph Administration of the State.

Accepted _____
the _____ of _____ 19____
Signed _____

CONDITIONS FOR THE INSTALLING AND WORKING OF WIRELESS STATIONS FOR EXPERIMENTAL PURPOSES.

E The license for the erection and for the working of the wireless plant is granted on the understanding that it may be revoked. The transfer of the license to third parties is prohibited.

2. The deed of license is a notice attested by the Imperial Postal Administration regarding the terms of working of the installed plant, such notice being acquiesced in by the owner of the plant by act of signature. The plant may only be erected and worked in accordance with the terms of this notice. Departures from the terms of the working instructions must first be approved by the Imperial Postal Administration.

3. In so far as the obtaining of the necessary consent of the authorities responsible for the upkeep of roads and of the owners or other parties interested in the surfaces crossed or used in passing over public roads and places with antennae wires or in the erection of supporting posts on private ground is concerned, this is a matter which lies entirely with the owner of the plant.

4. The plant may only be used for carrying out wireless experiments and for the reception of the information serving the purpose of such experiments. The transmission of other news from other wireless stations, with the exception of the news marked "For all," is forbidden. Wireless communications intended for others and which may unintentionally come through must neither be written down, nor communicated, nor made use of in any way.

owner must, with this end in view, take steps to have his wireless plant safeguarded, and to prevent its being used by unauthorised persons.

5. Only so much electrical energy must be used in transmission as may be absolutely necessary for giving effect to the object in view. The waves must be tuned as sharply as may be found possible in the present state of wireless technology.

6. The telegraph and telephone communications (or lines such as wireless) of the State Telegraphic Department and the similar Imperial and State Offices, as also the communications of the private telegraph installations which have already been authorised at the time of granting the foregoing license, must not be disturbed.

7. The plant is to be erected and continually maintained in such a manner that it cannot be prejudicially affected by the State telegraph and telephone lines. Any charges which may be incurred in removing possible causes of disturbances are to be borne by the owner of the plant.

8. The officials of the State Telegraphic Department are entitled to have access to the rooms and essential parts in which the wireless plant or any part thereof may be situated, and also to be given facilities for informing themselves as regards the arrangements which may have been made for the carrying out of the experiments.

9. The owner of the plant is responsible for any possible damage which may occur through the working of the wireless installation. He is responsible for the safeguarding of the plant and for preventing the illegal use of same by unauthorised persons.

10. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay.

11. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraphic Department.

12. The owner undertakes to pay an annual fee of m. to the State Post and Telegraph Department.

13. Failure to give effect to the foregoing conditions may involve the withdrawal of the license.

13. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out, at his own cost and without delay, any alteration or extension of the terms of the license contract

Accepted

the

of

Signed

1922

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR EXPERIMENTAL PURPOSES.

F 1. The license for the erection and for the working of the wireless plant is granted on the understanding that it may be revoked. The transfer of the license to third parties is prohibited.

2. The deed of license is a notice attested by the Imperial Postal Administration regarding the terms of working of the installed plant, such notice being acquiesced in by the owner of the plant by act of signature. The plant may be only erected and worked in accordance with the terms of this notice. Departures from the

terms of the working instructions must be first approved by the Imperial Postal Administration.

3. In so far as the obtaining of the necessary consent of the authorities responsible for the upkeep of roads or of the owners or other parties interested in the surfaces crossed or used in passing over public roads and places with antennae wires or in the erection of supporting posts on private ground is concerned, this is a matter which lies entirely with the owner of the plant.

4. The plant may only be used for carrying out wireless experiments used for the reception of the information serving the purpose of such experiments. The transmission of other news is not permitted either against payment or gratuitously. The reception of news from other wireless stations with the exception of the news marked "For all," is forbidden. Wireless communications intended for others and which may unintentionally come through must neither be written down, nor communicated, nor made use of in any way. The owner with this end in view must take steps to have his wireless plant safeguarded and to prevent its being used by unauthorised persons.

5. The plant must be erected and continually maintained in such a manner that any possible disturbing effect by the State telegraph and telephone lines cannot occur. Any charges which may be incurred in removing possible causes of disturbance are to be borne by the owner of the plant.

6. The officials of the State Telegraphic Department are entitled to have access to the rooms and essential parts in which the wireless plant or any part thereof may be situated, and to be given facilities for informing themselves as regards the arrangements which may have been made for the carrying out of the experiments.

7. The owner of the plant is responsible for any possible damage which may arise in respect of the State or third parties through the working of the wireless installation, pursuant to the legal regulations governing this matter.

8. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof, must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraphic Department.

9. The owner undertakes to pay a fee of m. to the State Telegraphic Department.

10. Failure to give effect to the foregoing conditions may involve the withdrawal of the license.

11. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out any alteration or extension of the terms of the license contract.

The owner will bear the whole cost arising from the amendment of the terms whether they are technical alterations to the wireless installations or of any other nature whatever.

Accepted.

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR THE RECEPTION OF THE NAUEN TIME SIGNALS.

G 1. The license for erection and working of the wireless installation is granted on the understanding that it may be revoked. Transfer of the license to third parties is prohibited.

2. A memorandum of the terms of working of the erected plant is attached to the deed of license and must be observed by the owner of the plant. The plant may only be erected and worked in terms of this memorandum. Departures from the terms of the memorandum are subject to the consent of the Secretary of State for Posts and Telegraphs.

3. The plant may only be used for the reception of time signals issued by the Nauen Station operating at present with a wavelength of 3,100 metres. Alteration of this wavelength is reserved.

4. The plant must comply with the following technical requirements:—

(a) The antenna must not be greater, and the connection between the antennæ and the detector circle must not be firmer, than may be necessary for the reception of the signals in view.

(b) The individual parts of the oscillating circuits, as also of the antenna circuit, must always be firmly connected together by means of solder. Exceptions to this rule are only permissible in the case of the switches of the detectors and long distance receivers.

(c) The soldered section must be enclosed within the casing containing all the parts of the apparatus, and is to be closed up by means of lead in such a way that only the switches of the detector and long distance receiver are accessible to the owner of the plant. A wire with a suitable insulating cover is to be used for the antenna conductor external to this enclosed part.

(d) Supplementary insertion of conductors or tuning devices is forbidden.

5. The plant is to be erected and maintained in such a manner that it cannot be prejudicially affected by the State telegraph and telephone lines. Any charges which may be incurred in removing possible causes of disturbance are to be borne by the owner of the plant.

6. The owner of the plant is responsible for any damage which may occur through the working of the wireless installation.

7. The officials of the State Telegraph Department are authorised to visit the premises in which the wireless installations or parts thereof are erected, and to take cognisance of the arrangements which may have been made for carrying out the experiments.

8. The owner of the plant is absolutely obliged under full responsibility to see that under all circumstances messages emanating from other wireless installations and which may be received by him, are kept secret. He is likewise responsible for the safeguarding of the wireless plant and for prevention of its illegal use by unauthorised parties. Failure to do so would involve the withdrawal of the license.

9. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraph Department.

10. The owner of the plant undertakes to pay an annual fee of m. to the State Telegraph Department.

11. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out any alteration or extension

of the terms of the license contract without delay at his own cost.

Accepted
the _____ of _____ 1921
Signed _____

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS STATIONS (TRANSMITTING AND RECEIVING STATIONS) FOR OVERLAND POWER STATIONS, WATERWORKS, ETC.

H 1. The license for the erection and working of wireless installations in

is granted to

on the understanding that it may be revoked. In the event of the high potential current undertaking or its working passing into other's hands, the transfer of the contract to the legal successor is to be notified without delay to the State Postal Department.

2. The license deed is an accompanying memorandum approved by the State Postal Department referring to the terms of working of the installed plant, which must be acquired in by the owner of the plant under signature.

The installations can only be carried out and worked in terms of this memorandum. Departures from the terms of this memorandum require the consent of the State Postal Department. Any alterations considered later to be necessary in the working instructions set forth in the memorandum in regard to supply of current, the wave to be used, call signals, working periods, etc., are determined by the State Telegraphic Department after consultation with the owner, and are to be given effect to.

3. In so far as it may be necessary to obtain the consent of the authorities charged with the upkeep of roads, property owners or other interested parties for stretching over public ways and places antennæ wires and wire conductors for telephonic communication by means of high frequency appliances, or for erecting supports on private property, the obtaining of such consent necessary for the purposes indicated is entirely a matter for the owner of the plant.

4. The range of communication of the different wireless working stations is regulated by the corresponding memorandum. As regards other wireless stations than those indicated in the memorandum, immediate exchange of messages is not admissible.

Only such news may be transmitted by the wireless plant as refer to the working of the high potential undertaking or the news establishments themselves. The transmission of other news is not allowed either against payment or gratuitously. The reception of news from other wireless stations is forbidden. Wireless communications which may inadvertently be picked up from outside sources must neither be written out, communicated to others, or made use of in any way.

The owner of the plant must have it specially safeguarded in order to ensure its not being used by unauthorised persons.

Every conversation must commence with the indication of the station taking part in such conversation (name and place) when using the telegraphic service with the call signal stipulated by the State Telegraphic Department.

5. When transmitting no more electrical energy must be used than is set forth in the corresponding memorandum. Any departure from the range of wave stated in the memorandum is not permissible. Accordingly the

erection of the apparatus used in the wireless plant must be in such correspondence with technical improvements that the use of waves beyond the admissible wave range is impossible, and picking up of wireless communications carried on other waves from other sources is impracticable. Furthermore, suitable means must be employed with the object of preventing high vibration of a character calculated to disturb other wireless communications.

6. The telegraph and telephone traffic (by means of conductors such as wireless) of the State Telegraph Service and other Imperial and State offices, as also private telegraph plants already in operation or invitation of the communication by means of the wireless plant, must not be disturbed by the working of the said wireless plant.

7. The technical arrangements and installations of the wireless plant are to be carried out and constantly maintained in such a manner that the disturbing influence of telegraph and telephone installations of the authorities mentioned under paragraph 6 cannot operate.

Any charges which may arise from rectifying such disturbances are to be borne by the owner of the plant.

8. Any order made in special cases by the State Telegraphic Department for the temporary suspension of the work must be obeyed without delay. During this time the working arrangements of the plant must be so dealt with in accordance with the judgment of the State Telegraphic Department that utilisation of the news plant is excluded. The State Telegraphic Department will supervise the carrying out of the arrangements decided upon.

The order may either be communicated in writing or by telegraph by the Chief Postmaster, or verbally by an official of the State Telegraphic Department provided with the necessary authority.

9.—The officials of the State Telegraphic Department who may present themselves in such capacity are invested with the right of access at all times to the rooms or premises in which the wireless installations or parts thereof may be, and to take cognisance of the arrangements appertaining to the wireless plant and of the working of communications.

10. The owner of the plant is responsible, pursuant to legal enactments on the subject, for any damage which may be sustained by the State Telegraphic Service or third parties through the erection and working of the plants.

11. The owner of the plant undertakes to pay an annual fee of m. to the State Telegraphic Service for each working station. The fixing of other fees is reserved.

12. Non-compliance with the foregoing conditions may entail the rescission of the license granted.

13. The amplification or alteration of the foregoing conditions is expressly reserved. In so far as such alterations affect the technical arrangements of the wireless stations or the working of the news plant, a suitable period for the carrying out of these alterations will be fixed as a matter of necessity.

All charges arising from the alteration of conditions are to be borne by the owner of the plant, whether these are technical alterations in the wireless arrangements or of any other nature.

Accepted

GIBRALTAR

(See also Map Section)

SITUATED in the Province of Andalusia, in Spain ($36^{\circ} 6' N.$ latitude and $5^{\circ} 21' W.$ longitude), Gibraltar commands the entrance to the Mediterranean. British since 1713, it is administered by a Governor. The total area is but $1\frac{1}{8}$ square miles, with a population of 19,586.

CONTROL.

In this essentially naval and military station, the Commander-in-Chief acts as Governor, exercising autocratically both administrative and legislative functions.

ORGANISATION.

There are no commercial wireless telegraph stations in Gibraltar, and the right to use wireless telegraphy is reserved to the Government. Private wireless of any description, whether amateur, commercial, or experimental is strictly forbidden; not only the control, but the possession and working of radiotelegraphy, being exclusively vested in military or naval hands. At the present time there are two stations in existence, one for Government traffic only, and one for Government and Commercial work.

ADMINISTRATION.

The Ordinance to prohibit importation, keeping, use or establishment of any apparatus or installation for transmission of messages by wireless telegraphy by unauthorised persons in Gibraltar came into force on October 20th, 1903. This Ordinance has been amended by the Wireless Telegraph Apparatus Amendment Ordinance, 1909 (February 3rd), and in the text below the amending words are shown in brackets:—

We print below the ruling Ordinances and Regulations :—

A—Wireless Telegraph Apparatus Ordinance, 1903.

B—Wireless Telegraph Apparatus Further Amendment Ordinance, 1909.

C—Rules as to use on Merchant Ships.

D—Ship License.

E—Ordinance as to Wireless Telegraphy on Ships.

F—Further Rules as to Use on Merchant Ships.

A 1. This Ordinance may be cited as "The Wireless Telegraph Apparatus Ordinance, Gibraltar, 1903."

2. No person shall import, keep, use or establish in Gibraltar *[or on board any British ship registered in Gibraltar]* any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the license in writing of the Governor, and under such terms and conditions as may be prescribed in such license, which license the Governor may in his discretion at any time cancel and revoke.

3. It shall be lawful for the Governor by order in writing to authorise the Chief of Police or any other person named by him in such order to enter at any time by day or night and by force, if necessary, any premises or place *[or any ship]* in Gibraltar, and to search for any such apparatus or installation as described in this Ordinance, and to seize and remove the same to be dealt with in such manner as the Governor may direct.

4. Any person offending against this Ordinance, or resisting or in any way interfering with any person charged with the execution of an order issued by the Governor under the preceding section, may be arrested without warrant and shall be liable on conviction by a Court of Summary Jurisdiction to a penalty not exceeding £50, or to imprisonment with or without hard labour for any term not exceeding three months.

5. All penalties under this Ordinance shall be recoverable summarily in manner directed by "The Justices Ordinance, Gibraltar, 1890."

B The "Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909" (April 30th), contains the following clause :—

2. A person shall not work any apparatus for wireless telegraphy installed on merchant ships, whether British or foreign, while in Gibraltar otherwise than in accordance with rules made in that behalf by the Governor, and the Governor may, by any such rules, impose penalties recoverable summarily for the breach of any such rules, not exceeding £10 for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ships. All such rules shall be published in the Official Gazette and after such publication shall have the same force and effect as if enacted in this Ordinance.

C The following rules as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in Gibraltar, were made on May 3rd, 1909, under "The Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909" :—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Gibraltar shall be worked in such a way as not to interfere with (a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in Gibraltar or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of Gibraltar, except with the special or general permission in writing of the Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Any person offending against any of these rules shall be liable to a penalty not exceeding ten pounds for each offence recoverable summarily under "The Justices Ordinance, Gibraltar, 1890," and any apparatus for wireless telegraphy installed or worked on such ship may be forfeited to His Majesty.

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

D To all to whom these Presents shall come.

I,....., Governor of the City and Garrison of Gibraltar send greeting :

Whereas Messrs....., of (hereinafter called the licensee) is desirous of establishing, installing, working and using, in a ship belonging to the licensee to wit the wireless telegraphy :

And Whereas by reason of the provisions of the Summary Conviction Ordinance, 1885, it is unlawful to establish, keep or use in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the license in writing of the Governor and under such terms and conditions as may be prescribed in such license.

And Whereas at the request of the licensee I have agreed to grant to the licensee the licenses, powers and authorities hereinafter expressed and contained for the period and upon the terms and subject to the stipulations and conditions hereinafter appearing :

Now, I, the above-named..... Governor of the City and Garrison of Gibraltar, in exercise of all powers and authorities enabling me in thi-

behalf, do hereby grant to the licensee, during the term or period commencing on the day of the date hereof and until these presents and the licence or permission hereby given shall be determined or revoked, licence and permission,

(i) To establish, install and work for the purposes hereinafter mentioned on board the steamship apparatus for wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus");

(ii) To send and receive messages by means of the licensed apparatus between the said steamship and coast stations and other ship stations.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. The provisions of the Imperial Telegraph Acts, 1863 to 1916, and the Regulations made thereunder shall be deemed to apply to this licence and on any breach thereof this licence shall be null and void.

2. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, the Service Regulations made thereunder and any modification of the Convention or Regulations made from time to time.

3. The licensee shall, except as set out hereinafter, use the licensed apparatus solely on behalf and in the course of the business of the licensee and the licensee shall not receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

4. The licensee shall so far as possible receive from ships and lights stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

Given under my hand and seal at Gibraltar this.....day of.....19..

AN ORDINANCE TO MAKE PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

NOVEMBER 8TH, 1920.

E Be it enacted by His Excellency the Governor of the City and Garrison of Gibraltar, as follows:—

1. (1) Every seagoing British ship registered in Gibraltar being a passenger steamer or a ship of sixteen hundred tons gross or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Ordinance, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules:

Provided that the Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Governor shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Imperial Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but, if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) The Governor shall appoint a surveyor of ships or a wireless telegraphy inspector who may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and for the purpose of that inspection such surveyor or inspector shall have all the powers of a Board of Trade inspector under the Imperial Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Governor to the Treasurer and Collector at Gibraltar, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance.

(5) The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Imperial Wireless Telegraphy, Act, 1904, or any Order-in-Council, or regulations made thereunder, or by the Imperial Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Gibraltar, apply to ships other than British ships registered in Gibraltar while they are within the port of Gibraltar in like manner as they apply to British ships so registered.

3. (1) This Ordinance may be cited as the Merchant Shipping (Wireless Telegraphy) Ordinance, 1920, and shall come into operation on the first day of December, 1920.

(2) This Ordinance shall be construed as one with the Merchant Shipping Ordinance 1886, and "passenger steamer" shall mean a steamer which carries more than twelve passengers.

Passed, 8th November, 1920.

By Command,

Colonial Secretary.

RULES MADE BY THE GOVERNOR UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ORDINANCE, 1920.

INTERPRETATION.

F 1. In these Rules—
The expression "coasting trade" means trade between such ports as would constitute the vessel a "home trade ship" as defined in the Merchant Shipping Ordinance, 1886.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one and a half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Three operators of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. Two operators of whom one shall hold a First or a Second Grade Certificate.

(c) Voyage not exceeding 8 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS AND WATCHERS.

(a) Voyage exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate, and two watchers.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate, and one watcher.

(c) Voyage not exceeding 8 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Governor a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid:—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Two operators, one of whom shall hold a First Grade Certificate.

(b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Governor and watchers shall be certificated by the Postmaster-General of the United Kingdom hereinafter called the Imperial Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid:—

(i) An operator who holds the Imperial Postmaster-General's First Class Certificate of Proficiency and who has had three years' experience as an operator may be employed as if he held a First Grade Certificate, but if an operator holding a First Grade Certificate is available an operator holding a First Class Certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade Certificate.

(iii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade Certificate.

11. The Governor may accept in lieu of the certificate of the Imperial Postmaster-General certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of December, 1920.

Given under my hand and seal, at Gibraltar this day of

By Command,

Colonial Secretary.

GILBERT AND ELLICE ISLANDS

(See under PACIFIC ISLANDS)

GÔA

(See also Map Section)

THE Portuguese possessions in India consist of Gôa, Damão and the Island of Diu, 140 miles south-west of Damão. The total area of these possessions is 1,638 square miles, and with a population of 548,472.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Gôa.

GOLD COAST

(See also Map Section)

THE Gold Coast Colony comprises the coast of the Gulf of Guinea from about longitude 3° 7' W. to 1° 14' E. of Greenwich; with a protectorate extending inland to an average distance of 440 miles or to the 11° of N. latitude. It is bounded on the west and north by the French Colonies of the Ivory Coast and French Sudan, and on the east by the ex-German colony of Togoland. The seat of Government is at Acra, and the administration is conducted by a Governor. It has an area of 80,000 square miles, with a population of 1,503,386.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. S. B. Gosling	Postmaster-General	Accra.
Major J. F. O'Shaughnessy ..	Engineer-in-Chief of Posts and Telegraphs Dept.	Do.
Mr. L. C. C. Miles	Operator	Do.
Mr. A. W. Spurling	Do.	Do.

ORGANISATION.

Radiotelegraphy was introduced in 1912, and in 1913 the Accra station was completed.

There are no privately owned experimental or amateur stations; neither are there any wireless clubs or societies. In fact no licenses have been issued to any classes of individual or corporations, radiotelegraphy in this Colony being still in its infancy.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in this Colony was "The Wireless Telegraphy Ordinance, 1903." This was followed by "The Wireless Telegraphy (Amendment) Ordinance, 1913" (see the WIRELESS YEAR-BOOK for 1915). These Ordinances, however, were both of them repealed by "The Wireless Telegraphy Ordinance No. 15 of 1913," which is the extant Government Ordinance as at present administered, and the text thereof will be found below.

Annexed to this Ordinance are regulations applying to Merchant Ships, whereof the text appears below. In 1917 the Government promulgated Rules for the Regulation of Wireless Telegraphy within its territorial waters. These rules also figure in the following pages:—

The Laws and Regulations here printed are:—

- A—Wireless Telegraphy Ordinance No. 15 of 1913 (dated October 4th, 1913).
- B—Regulations (Merchant Ships).
- C—Rule No. 17 of 1917.

A An Ordinance (No. 15) to provide for the regulation of Wireless Telegraphy, 4th October, 1913.

Be it enacted by the Governor of the Gold Coast Colony, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions, and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant

ship, whether British or foreign, while that ship is in the Colonial waters otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the Colonial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate or District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or

worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any Commissioner or Assistant Commissioner of Police or any person appointed in that behalf by the Commissioner of Police and named in the warrant, and a warrant so granted shall authorise the Commissioner or Assistant Commissioner of Police or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a District Commissioner's Court on the complaint of a Commissioner or Assistant Commissioner of Police or of any person thereto authorised by the Commissioner of Police in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy (Amendment) Ordinance, 1913, are hereby repealed.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the Colonial waters shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the Colonial waters and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being, or appearing to be, in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be, in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

RULE NO. 17 OF 1917.

C Under and by virtue of section 8 of the Defence of the Colony Ordinance, 1914, I, Sir Hugh Charles Clifford, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief of the Gold Coast Colony, with the advice of the Executive Council of the said Colony, do hereby make the following rules which I, with the advice aforesaid, consider necessary for the public safety and the Defence of the Colony.

1. The radiotelegraphic stations on board ships (other than His Majesty's ships of war) shall not be worked, except for the reception of messages whilst such ships are within any harbour, port or within any roadstead within the Colonial waters of the Colony.

2. For the proper enforcement of the last preceding rule.

(a) The master of every ship of British or Allied register whilst in any such harbour, port or roadstead shall cause the sending and transmitting portion of the radio apparatus on such to be disconnected and to be kept disconnected from the dynamo, accumulators, or other source of electrical power available, so that radio messages cannot be sent from the ship.

(b) If an officer appointed in writing by the Postmaster-General to examine the wireless apparatus on any ship shall so order, the master of such ship within such harbour, port or roadstead shall cause all portions of the radio apparatus on such ship to be disconnected or sealed in such manner as such officer shall order, and shall cause the same to be kept so disconnected or sealed while such ship is within such harbour, port or roadstead.

(c) The master of a ship of neutral register shall immediately on arrival in any such harbour, port or roadstead cause the aerial wires to be taken down completely and disconnected from the radiotelegraph apparatus on such ship and shall cause such wires to remain so down and disconnected while such ship is in such harbour, port or roadstead, and shall cause the operating room to be sealed and kept sealed and such other steps to be taken as any officer appointed by the Postmaster-General for the purpose may order.

Made at a meeting of the Executive Council held at Government House, Accra, this 1st day of September, 1917.

(Signed) HUGH CLIFFORD,
Governor.

GREAT BRITAIN

(See also Map Section)

Including : The Isle of Man and the Channel Islands.

THE total area of the British Isles is reckoned at 89,077 square miles, whilst in 1921 the population numbered 42,917,382.

Our own country is proud to share with Italy in the production of Senatore Marconi. England has been the chief scene of his labours. The first British patent for Wireless Telegraphy was No. 12,039, lodged by the Italian inventor in 1896. Ever since that date Great Britain has been in the forefront of wireless activities, and British radio telegraphy is continually expanding in all directions.

CONTROL.

The Postmaster-General is responsible for the administration of wireless telegraphy in Great Britain.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Rt. Hon. Neville Chamberlain, M.P. ..	Postmaster-General	General Post Office, London, E.C.
Sir George Evelyn P. Murray, K.C.B...	Secretary to Post Office.. ..	Ditto.
Mr. F. J. Brown, C.B., C.B.E., M.A., B.Sc.	Assistant Secretary to Post Office	Ditto.
Mr. J. I. De Wardt, O.B.E.	Principal	Ditto.

DEPARTMENT OF THE INSPECTOR OF WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Comdr. F. G. Loring, R.N., M.I.E.E...	Inspector of Wireless Telegraphy	General Post Office, London, E.C.
Lt.-Col. C. G. G. Crawley, R.M.A., M.I.E.E.	Deputy Inspector of Wireless Telegraphy.	Ditto.
Mr. F. Addey, B.Sc. (Lond.), M.I.E.E., Fellow I.R.E.	Assistant Inspector of Wireless Telegraphy.	Ditto.
Lt.-Comdr. E. L. C. Grattan, D.S.O., R.N.	Ditto	Ditto
Mr. S. E. J. Burrow	Ditto	Ditto

ORGANISATION.

Early in 1914 a Bill was presented to the House of Commons by the President of the Board of Trade to amend the laws relating to merchant shipping so as to give effect to the International Convention for the Safety of Life at Sea, signed at London on January 20th, 1914. Under the title "Merchant Shipping (Convention) Act, 1914," this Bill was passed in August, 1914, and was due to come into force on July 1st, 1915, but has not yet been put into operation. Part III of the Act refers to wireless telegraphy and is printed below.

Section 22 of the Defence of the Realm Regulations expired on August 31st, 1921.

A new Act—the Merchant Shipping (Wireless Telegraphy) Act, 1919—came into operation on September 1st, 1920. We print the Act and rules hereunder.

Regarding experimental and private business stations, a new Wireless Telegraphy Bill has been introduced into Parliament, and the various forms of experimental and private business license have been revised. The Bill, as introduced, is printed below.

The removal of restrictions on amateur working which has taken place was immediately productive of a keen stimulus to experimentalism, and the possibilities of broadcasting promise well for the future of the movement.

Licenses for broadcast reception are now obtainable at any Post Office, and are issued subject to the proviso that the apparatus to be used has been passed by the British Broadcasting Company and the Postmaster-General acting in concert. The terms of the license and regulations thereunder are printed below.

ADMINISTRATION.

The following is the list of items to be found below:—

- A—Wireless Telegraphy Act, 1904.
- B—Order in Council, February 29th, 1908.
- C—Wireless Telegraphy (Foreign Ships) Regulations, 1908.
- D—Ship Stations License.
- E—Private Business License.*
- F—Board of Trade Notice (Signalling Practice).
- G—Merchant Shipping (Convention) Act, 1914. (Part III.)
- H—Extracts from *London Gazette*, April 29th, 1919.
- I—Merchant Shipping (Wireless Telegraphy) Act, 1919.
- J—Rules made under Merchant Shipping (Wireless Telegraphy) Act.
- K—Postmaster-General's authority for the use of Transmitting and Receiving Apparatus for Amateurs.
- L—Postmaster-General's authority for the use of Receiving Apparatus only for Amateurs.
- M—Extract from Convention relating to International Air Navigation, 1919.
- N—Form of License for Wireless on Aircraft.
- O—Admiralty Notice to Mariners No. 524 of March 25th, 1920.
- P—Admiralty Notice to Mariners No. 838 of May 22nd, 1920.
- Q—Admiralty Notice to Mariners No. 952 of June 15th, 1920.
- R—Air Ministry Notice to Airmen No. 103 of September 30th, 1920.
- S—A Bill to Amend the Wireless Telegraph Act, 1904 (Provisional).
- T—License and Regulations for Broadcast Reception.
- U—Regulations for Post Office approval of Broadcast Reception apparatus.

WIRELESS TELEGRAPHY ACT, 1904.

Following the termination of the meeting of the delegates at the International Conference in Berlin in 1903, the British Government drafted a Wireless Telegraph Act to define the official position of the Postal and Telegraph Department in the United Kingdom in regard to the new development. The Act received Royal assent on August 15th, 1904, and the text is as follows:—

1. (1) A person shall not establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy, in any place or on board any British ship except under and in accordance with a license granted in that behalf by the Postmaster-General.

(2) Every such license shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted, and any such license may include two or more stations, places, or ships.

(3) If any person establishes a wireless telegraph station without a license in that behalf, or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour, and be liable, on conviction under the Summary Jurisdiction Acts, to a penalty not exceeding ten pounds, and on conviction on indictment to a fine not exceeding one hundred pounds, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit

any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade.

(4) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Sections 684, 685, and 686, of the Merchant Shipping Act, 1894 (which relate to the jurisdiction of courts and justices), and section 693 of the same Act (which relates to distress for sums ordered to be paid by masters and owners of ships), shall apply to the jurisdiction of courts and justices in respect of ships, and to distress under this Act.

(6) The Postmaster-General may make regulations for prescribing the form and manner in which applications for licenses under this

* The terms of this license are no longer operative, and a new form of license is likely to be issued shortly.

Act are to be made, and, with the consent of the Treasury, the fees payable on the grant of any such license.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in the Telegraph Acts 1863 to 1904, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Act shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) Where the applicant for a license proves to the satisfaction of the Postmaster-General that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the Postmaster-General may think proper, but shall not be subject to any rent or royalty.

(2) Where an applicant for a license satisfies the Postmaster-General that a wireless telegraph station is to be used solely for the transmission of telegrams which are within the first or second exception from the exclusive privilege of transmitting telegrams conferred upon the Postmaster-General by the Telegraph Act, 1869, a license for that purpose, if granted, shall not be subject to any rent or royalty.

(3) It shall be lawful for the Postmaster-General, due regard being had to the maintenance and exercise of effective control over wireless telegraphy, to grant special licenses at reduced terms for the establishment and working of wireless telegraph stations to be used exclusively for the transmission within the United Kingdom of news to public registered newspapers. A schedule of all reduced rents or royalties imposed by any special licenses shall be laid before both Houses of Parliament within fourteen days of the commencement of the session next succeeding the grant of any such licenses.

3. (1) This Act may be cited as the Wireless Telegraphy Act, 1904, and may be cited with the Telegraph Acts, 1863 to 1904.

(2) This Act shall extend to the whole of the British Islands and to all British ships in the territorial waters abutting on the coast of the British Islands, and the Royal Courts of the Channel Islands shall register this Act accordingly.

(3) His Majesty in Council may order that this Act shall, subject to any conditions, exceptions, and qualifications contained in the order, apply during the continuance of the order to British ships whilst on the high seas.

(4) A person shall not work any apparatus for wireless telegraphy installed on a foreign ship whilst that ship is in territorial waters otherwise than in accordance with regulations made in that behalf by the Postmaster-General, and the Postmaster-General may, by any such regulations, impose penalties recoverable summarily for the breach of any such regulations not exceeding ten pounds for each offence and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Act shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. In the application of this Act to Scotland the expression "Misdemeanour" means crime and offence.

5. In the application of this Act to the Channel Islands and the Isle of Man:—

(1) The Lieutenant-Governor of the Island of Jersey or the Island of Guernsey, and the Governor, Lieutenant-Governor, or Deputy-Governor of the Isle of Man, as the case may require, shall be substituted for the Board of Trade.

(2) Offences may be prosecuted, fines recovered, proceedings taken, and search warrants issued in such courts and in such manner as may for the time being be provided in the Channel Islands and the Isle of Man by law, or, if no express provision is made then in and before the courts and in the manner in which the like offences, fines, proceedings, and warrants may be prosecuted, recovered, taken, or issued therein by law, or as near thereto as circumstances admit, and the bailiff or his lieutenant, or any jurat of the Royal Court in the Island of Jersey or the Island of Guernsey, and the judge or any jurat of the Court of Alderney, and the high bailiff or two justices of the peace in the Isle of Man, shall respectively be substituted for a justice of the peace.

—6. This Act shall continue in force until the thirty-first day of July, nineteen hundred and six, and no longer unless Parliament otherwise determines. (It was renewed until December 31st, 1909, and has since been extended from year to year by the Expiring Laws Continuance Act.)

B The following Order in Council is dated February 29th, 1908:—

(1) The Wireless Telegraphy Act, 1904, shall apply to British ships whilst on the high seas, provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act, 1904, by reason of the installation or working of wireless telegraphy on such ship if the authority in such Possession or Protectorate, having power by law so to do, shall have granted a license for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such license.

(2) The Interpretation Act, 1889, shall apply for the purpose of the interpretation of this Order as it applies for the purpose of the interpretation of an Act of Parliament.

(3) This Order shall be published in the *London Gazette*, and shall come into operation immediately from and after the expiration of three months after this Order is so published.

(4) This Order may be cited as "The Wireless Telegraphy Order, 1908."

C An Order was issued in 1908 (No. 496) containing regulations relating to foreign ships:—

1. In these Regulations unless the context otherwise requires—

"Wireless Telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1904.

"Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy

and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

"Territorial Waters" means such part of the sea adjacent to the coast of the British Islands as is deemed by international law to be within the territorial sovereignty of His Majesty, and includes harbours.

"Harbour" includes harbours properly so called, whether natural or artificial, estuaries, navigable rivers, piers, jetties, and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

When communications are made by means of wireless telegraphy between a foreign ship in territorial waters and a wireless telegraph station in the British Isles, the rules in force for the working of wireless telegraphy at that station shall be observed.

3. All apparatus for wireless telegraphy on board a foreign ship in territorial waters shall be worked in such a way as not to interrupt or interfere with—

(a) Naval Signalling, or

(b) the working of any wireless telegraph station lawfully established, installed, or worked in the British Islands or the territorial waters abutting on the coast of the British Islands, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. (1) Except with the special permission in writing of the Postmaster-General no apparatus for wireless telegraphy on board a foreign ship (other than a ship of war) shall be worked or used whilst such ship is in any harbour in the British Islands.

(2) Without prejudice to the operation of the general provisions of these Regulations, the use of wireless telegraphy on board a foreign ship of war while in a harbour in the British Islands shall be subject to such rules (whether prohibitive or regulative) as may be made by the Admiralty from time to time.

5. (1) If at any time in the opinion of one of His Majesty's Principal Secretaries of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board foreign ships whilst in territorial waters shall be subject to such rules as may be made by the Admiralty from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

(2) Such notice as aforesaid shall be published in the *London Gazette*, the *Edinburgh Gazette*, and the *Dublin Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

6. (1) Any person who shall offend against any provision of these Regulations or of any Rules made by the Admiralty thereunder shall be liable on conviction under the Summary Jurisdiction Acts for every such offence to a penalty not exceeding ten pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy installed or worked on board the ship on which the offence was committed shall be seized and forfeited.

(2) For the purposes of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any foreign ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(3) Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

8. These Regulations shall come into operation on the first day of July, 1908.

9. These Regulations may be cited as "The Wireless Telegraphy (Foreign Ships) Regulations, 1908."

D The following is a copy of the form of License granted by the Postmaster General to establish Wireless Telegraph Ship Stations:—

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come

I, The Right Honourable

His Majesty's Postmaster-General send greeting:

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 and the Wireless Telegraphy Order 1908 it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a license granted in that behalf by the Postmaster-General:

And whereas — (hereinafter called the licensee) has applied to the Postmaster-General for the grant of a license to establish instal and work apparatus for wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904 at the ship station or stations mentioned in the Schedule hereto.

Now I the above-named — His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December next and thereafter so long as the Wireless Telegraphy Act 1904 shall remain in force unless and until these presents and the license and permission hereby given shall be determined license and permission—

(1) To establish install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Provided that—

(a) Each ship station shall comply in all respects with the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919;

(b) The apparatus installed at each ship station shall be of the character specified in the said Schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Post Office for the time being. The licensed apparatus may be so constructed as to use any of the wavelengths specified in columns 5 and 6 of the Schedule hereto or any wavelengths prescribed by any administration for communication with direction finding stations and such other wavelengths as may be authorised in writing from time to time by the Postmaster-General. Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used for transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention 1912:

Provided further that only the wavelength of 600 metres (except as directed by the Admiralty) shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(e) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word;

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations. Provided that the licensee shall not except with the consent in writing of the Postmaster-General at any time send spoken messages from the said ship stations or send or receive messages from and at the said ship stations when in any harbour in the British Islands; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" means respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Postmaster-General so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall keep the licensed apparatus and in particular the headgear receivers thereof in a clean and sanitary condition.

10. The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of operators and watchers.

11. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. (1) Subject to the provisions of this license the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of any British Possession or Protectorate the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

13. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

14. The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Postmaster-General and the licensee shall provide for the working of each station such certified operators and watchers as are required by the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919.

15. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license entitling the Postmaster-General under Clause 24 hereof to revoke and determine this license.

16. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used

message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention 1912 and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the registered office of the licensee for the time being or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

17. The licensee shall render to the Postmaster-General such accounts as the Postmaster-General shall direct in respect of all charges due or payable under the Radiotelegraph Convention 1912 in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Postmaster-General at such times and in such manner as the Postmaster-General shall direct all sums which shall be due from the licensee under such accounts.

18. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

19. The licensee shall carry on every ship on which a ship station is established under this license a print or copy of the license certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Postmaster-General for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention 1912.

20. The licensee shall forthwith pay to the Postmaster-General and in respect of the license hereby granted a sum of two pounds in respect of each ship station at which the licensed apparatus is installed and in addition thereto a sum of two pounds in respect of each such ship station on the first day of January in each year during which the license remains valid.

21. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licenses powers or authorities.

22. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Customs or Police Officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said

1	2	3	Character of Apparatus.			Power.		9
Name of Ship on which Station established.	Call-Signal.	Normal Range of Signalling in Nautical Miles.	4	Wavelengths (in Metres).		7	8	If Alternator is used, Number of Cycles per Second.
			5	6				
			System of Radiotelegraphy with the Characteristics of the System of Emission.	Spark or Interrupted Continuous Wave.	Continuous Wave.	Source.	Maximum to be taken by Sending Instruments.	
						Ship's mains.		

apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

23. At any time after the 31st day of December 1902 the Postmaster-General may in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

24. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the

licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained

then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licenses powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

25. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

26. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the registered office for the time being of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be

served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

Lastly any license or permit heretofore granted by the Postmaster-General to the licensee in respect of any of the ships specified in the Schedule hereto is hereby revoked.

As witness my hand and seal this day of one thousand nine hundred and

Signed sealed and delivered by

On behalf of the Postmaster-General in the presence of

LICENSE TO USE WIRELESS TELEGRAPHY FOR PRIVATE BUSINESS.*

Whereas

E of in the county of (hereinafter called "the licensee") is desirous of establishing installing working and using a system of wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904:

And whereas by reason of the provisions of the Telegraph Acts 1863 to 19 it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place except under and in accordance with a license granted in that behalf by the Postmaster-General and it is also unlawful save as in the said Acts provided to transmit telegrams within the United Kingdom:

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above-named

His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December 19 license and permission—

(i) to establish and install and work at the stations specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at each station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) to transmit and receive messages on the private business of the licensee by means of the licensed apparatus between the said stations.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:

1. In these presents (and in the schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

* The terms of this license are no longer operative, and a new form of license is likely to be issued shortly.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

Apparatus shall be deemed to be "syn-tonised" when the transmitting apparatus is so adjusted as to communicate with a receiver which has a corresponding adjustment and to produce as little effect as possible on a receiver not having a corresponding adjustment.

2. (1) The licensed apparatus shall not be used by the licensee or by any person either on behalf or by permission of the licensee for any purpose except for the transmission and receipt of such messages as aforesaid between and at the stations specified in the Schedule hereto.

(2) No money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee in respect of the transmission or receipt of any messages by means of the licensed apparatus or any part thereof.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at any signal station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee shall if so required in writing by the Admiralty cease to use the licensed apparatus for such period (not exceeding two hours in any one day) as may be specified by the Admiralty.

(4) If the Admiralty are of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Postmaster-General close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 19 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business.

5. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established in the British Islands or the territorial waters abutting on the coasts of the British Islands (whether on shore or on any ship) by or for the purposes of the Postmaster-General or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any

messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees—

(a) With respect to all arrangements to be adopted for the purpose of securing synchronised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(b) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(c) Generally with respect to avoiding interference between one wireless telegraph station and another.

6. The licensed apparatus shall not without the consent in writing of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

7. The licensee shall at all times indemnify the Postmaster-General against all actions, claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

8. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

9. Subject to the provisions of this license the licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

10. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such places respectively and the working and user of such apparatus and telegraphic instruments respectively.

11. (1) All apparatus used or intended to be used by the licensee shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Postmaster-General which may from time to time exist or which it is probable that the Postmaster-General may have occasion to erect place fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof.

(2) In case any telegraphic line of the Postmaster-General shall be damaged or the efficient working or user thereof shall be

wholly or partially interrupted or otherwise interfered with and the Engineer-in-Chief for the time being of the Post Office shall certify in writing under his hand that such damage interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee or by anything done by or on behalf of the licensee in relation thereto the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said Engineer-in-Chief shall certify that such addition or substitution is reasonably required.

(3) For the purposes of this Article the expression "telegraphic line" has the same meaning as in the Telegraph Act 1878 and the expression "telegraphic line of the Postmaster-General" includes a telegraphic line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Government or other body or person.

12. (1) The licensee shall pay to the Postmaster-General on the 1st day of December next for and in respect of the license hereby granted a royalty of £ per annum in respect of each station.

(2) In the event of the renewal of this license the said royalty shall be payable on the same day in each succeeding year.

13. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licenses powers or authorities.

14. If and whenever in the opinion of one of His Majesty's Principal Secretaries of State an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the said Secretary of State by warrant under his hand to direct and cause the licensed apparatus or any part hereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the said Secretary of State may enter upon the stations offices and works of the licensee or any of them and take possession thereof and use the same as aforesaid.

15. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

16. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained;

then and in any such case the Postmaster-General may by writing under his seal revoke and determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said licenses powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

17. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature or those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

18. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any one of the Secretaries or Assistant Secretaries for the time being of the Post Office, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

F In October, 1912, the Board of Trade, at the request of the Lords Commissioners of the Admiralty, issued a notice directing the attention of Masters and Owners of British Merchant Vessels to the necessity for arranging for periodical practices in Wireless Telegraphy communications between H.M. Ships of War and Ships of the British Mercantile Marine for the purpose of ensuring efficient and reliable communication when required.

The co-operation is invited of all British shipowners and masters whose ships are fitted with wireless telegraphy, in order to give effect to the following proposals:—

(1) At 8:30 a.m. and 2:30 p.m. daily any single man-of-war (destroyers and small craft excluded) or one man-of-war in a fleet in company, detailed by the Senior Naval Officer present, will adjust her wireless telegraphy transmitting and receiving apparatus to the commercial 600 metre wavelength and make

the call "CCCC," followed by her own commercial call sign, indicating that she is prepared to carry out an exercise with any British merchant ship within range.

On a British merchant ship receiving this call she will answer and say whether or not she is prepared to proceed with the exercise. Should more than one merchant ship answer, the man-of-war will indicate which is to exercise and which is to wait.

The exercise will then proceed, but no messages are to be exchanged which are not authorised by the respective captains and masters of the ships practising. No message received during such exercises is to be forwarded beyond the ship actually receiving the message and no payment for any message can be made. The exercises are to be considered as strictly on Service and not for any commercial advantage.

(2) In all such exercises the man-of-war is to be considered the controlling ship.

(3) The exercises will cease at 9.15 a.m. and 3.15 p.m. respectively, or before, at the discretion of the captains concerned.

(4) These exercises are only to be carried out between vessels neither of which is within 150 miles range of any commercial shore station using the 600 metre wavelength, and are to cease at once should one of H.M. ships so direct.

MERCHANT SHIPPING (CONVENTION) ACT, 1914.

G An Act to make amendments of the law relating to Merchant Shipping as are necessary or expedient to give effect to an International Convention for the Safety of Life at Sea, signed in London on January the twentieth, nineteen hundred and fourteen, and for purposes incidental thereto. (August 10th, 1914.)

PART III.

(Which deals with Wireless Telegraphy.)

15. (1) Subject to the provisions of this Act every British ship registered in the United Kingdom which carries 50 or more persons shall be provided with a wireless telegraphy installation, and shall maintain a wireless telegraphy service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with certified operators and watchers at least in accordance with those rules. Provided that the obligations imposed by this section shall not come into operation until such date, not being less than six months after the making of those rules, as may be specified in the rules.

(2) In reckoning the number of persons carried on a ship for the purpose of this section, persons shall not be counted who are exceptionally and temporarily carried on a ship—

(a) As the result of *force majeure*; or

(b) as the result of the necessity of increasing the number of the crew to fill the places of members of the crew who are ill or disabled; or

(c) as the result of the obligation on the part of the master to carry shipwrecked persons, or persons in like circumstances or,

(d) if so provided by rules of the Board of Trade, as cargo hands for a part of the voyage not being between one continent and another and not being, during the time the hands are carried, outside the limits of latitude thirty degrees north and thirty degrees south.

THE SCHEDULE.

Name of Station.	Normal Range of Signalling.		Character of Apparatus.		Power.		If Alternator is used, No. of Cycles per Second.
	By Night.	By Day.	Description of Receiving Apparatus.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken by Transmitting Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily the fine shall not exceed one hundred pounds.

16. (1) The Board of Trade, in consultation with the Postmaster-General, shall make such rules with respect to wireless telegraphy installations and service on British ships which are registered in the United Kingdom and with respect to the carrying on those ships of operators and watchers for the purposes of wireless telegraphy, as appear to them necessary or expedient to carry into effect the provisions of the Convention mentioned in Part V of the Third Schedule to this Act.

(2) The Board of Trade may by rules made under this section exempt from the obligations of this Act as to wireless telegraphy—

(a) Ships while on voyages the course of which does not take the ship more than a hundred and fifty sea miles from the nearest coast, if the Board are satisfied that the route and the conditions of the voyage are such as to render compliance with those obligations unreasonable or unnecessary and,

(b) sailing ships on which owing to the peculiar or primitive nature of their build, it is impossible to provide a proper wireless telegraphy installation.

(3) The Board of Trade may by rules made under this section provide that any automatic calling apparatus which is certified by them to be efficient and to have been accepted by the parties to the Convention may be substituted, for the purposes of the provisions of this Act and any rules made thereunder relating to wireless telegraphy, for a certified operator or watcher.

17. The Board of Trade may postpone the operation of the provisions of this Act relating to wireless telegraphy as respects any particular ship for such period as the Board of Trade determine in each case, if it is shown by the owners of the ship that they have taken all reasonable steps to comply with the provisions of this Act as respects the ships, but that they have been unable to do so owing to difficulties in obtaining delivery of any wireless telegraphy apparatus or of obtaining the service of certificated operators or watchers.

The period of postponement under this section shall not exceed one year in the case of ships which are required in pursuance of the

Convention to provide a first-class wireless telegraphy service, and two years in the case of ships which are so required to provide a third-class wireless telegraphy service, and in the case of ships which are so required to provide a second-class wireless telegraphy service shall not exceed one year as respects the provision of a wireless telegraphy installation and two years as respects the provision of a continuous watch.

H EXTRACTS FROM SUPPLEMENT TO THE LONDON GAZETTE OF TUESDAY, THE 29TH OF APRIL, 1919.

Wednesday, 30th April, 1919.

Air Ministry.

AIR NAVIGATION REGULATIONS, 1919.

ORDER OF THE SECRETARY OF STATE UNDER THE AIR NAVIGATION ACTS, 1911 TO 1919.

In pursuance of the powers conferred upon me by the Air Navigation Acts, 1911 to 1919, and all other powers enabling me in that behalf, I, the Right Honourable Winston Spencer Churchill, one of His Majesty's Principal Secretaries of State, by order make the following regulations:—

GENERAL CONDITIONS OF FLYING.

1. No aircraft shall fly within the limits of the British Islands and the territorial waters adjacent thereto unless the following conditions are complied with:—

(6) No mails shall be carried without the consent in writing of the Postmaster-General and no wireless apparatus shall be installed or worked except under and in accordance with a license granted by the Postmaster-General, containing such conditions as may be approved by the Secretary of State:—

PRODUCTION OF LICENSES, CERTIFICATES AND LOG-BOOKS FOR INSPECTION.

6. (1) Any member of the personnel of an aircraft shall on demand produce his license for the inspection of any person authorised for the purpose by the Secretary of State.

(2) The owner and person in charge of any aircraft shall, on demand, produce for the inspection of any person authorised for the purpose by the Secretary of State, any certificates or licenses relating to the aircraft, and also, in the case of passenger or goods aircraft, any of the prescribed log-books.

EXCEPTIONS.

8. These regulations do not, except where otherwise expressly stated, apply—

- (a) to military aircraft belonging to or employed in the service of His Majesty; or
- (b) to any aircraft or to any persons if and to such extent as such aircraft or persons may be excepted from these regulations, or any of them, by direction of the Secretary of State on the recommendation of a Government Department.

PENALTIES.

10. (1) Where any aircraft flies in contravention of, or fails to comply with, these regulations or any provision thereof, the owner of the aircraft, and also the pilot or commander, shall be deemed to have contravened, or, as the case may be, failed to comply with these regulations:

Provided that it shall be a good defence to any proceedings for contravention or failure to comply with these regulations if the contravention or failure is proved to have been due to stress of weather or other unavoidable cause.

(2) If any person obstructs or impedes any person acting under the authority of the Secretary of State in the exercise of his powers and duties under these regulations, such first-mentioned person shall be deemed to have acted in contravention of these regulations.

(3) Any person contravening or failing to comply with these regulations or any provision thereof is liable to imprisonment for a term not exceeding six months or to a fine not exceeding two hundred pounds, or to both such imprisonment and fine.

(5) If any person in any aircraft is guilty of any act of espionage to which the provisions of section one of the Official Secrets Act, 1911, apply, he is liable to penal servitude for a term not exceeding seven years.

INTERPRETATION.

12. In these regulations, unless the context otherwise requires—

“Aircraft” includes airships and flying machines, all balloons, whether fixed or free, and kites;

“Military aircraft” includes naval, military, and air-force aircraft;

“Personnel” (in relation to any aircraft) includes any pilot, commander, navigator, and engineer, and any operative member of the crew;

The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the purpose of the interpretation of an Act of Parliament, and as if these regulations were an Act of Parliament.

SHORT TITLE.

14. These regulations may be cited as the Air Navigation Regulations, 1919.

WINSTON S. CHURCHILL,

One of His Majesty's Principal Secretaries of State.

Air Ministry, London,
30th April, 1919.

MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919. CHAPTER 38.

AN ACT TO MAKE FURTHER PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

August 15th, 1919.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent

of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. (1) Every sea-going British ship registered in the United Kingdom being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules:

Provided that the Board of Trade may exempt from the obligations imposed by this Act any ships or classes of ships if they are of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Board of Trade, in consultation with the Postmaster-General, shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Act, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Board of Trade to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Act.

(5) The obligations imposed by this Act shall not come into operation while the obligations with respect to wireless telegraphy on ships imposed by the Defence of the Realm Regulations remain in force, but shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Wireless Telegraphy Act, 1904, or any Order in Council, or regulations made thereunder, or by the Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Act shall, as from a date three months after the coming into operation of the obligations imposed by this Act on British ships registered in the United Kingdom, apply to ships other than British ships registered in the United Kingdom while they are within any port in the United Kingdom in like manner as they apply to British ships so registered.

3. (1) This Act may be cited as the Merchant Shipping (Wireless Telegraphy) Act, 1919, and the Merchant Shipping Acts, 1894 to 1916, and this Act may be cited together as the Merchant Shipping Acts, 1894 to 1919.

(2) This Act shall be construed as one with the Merchant Shipping Act, 1894, and "passenger steamer" shall mean a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed under section twenty of the Merchant Shipping (Convention) Act, 1914, for the purposes therein mentioned.

THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES, 1920, DATED JULY 10TH, 1920, MADE BY THE BOARD OF TRADE UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919 (9 & 10 GEO. 5, C. 38).

The Board of Trade hereby make the following rules under the provisions of the Merchant Shipping (Wireless Telegraphy) Act, 1919.

Dated this tenth day of July, 1920.

H. A. PAYNE,

Secretary to the Board of Trade.

INTERPRETATION.

1. In these Rules—

The expression "coasting trade" means trade exclusively carried on between ports in the British Islands.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons. In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal condition and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(a) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators of whom one shall hold a First or a Second Grade certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS AND WATCHERS.
(a) Voyage exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and two watchers.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and one watcher.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

Schedule.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° East	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean.	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade and the Postmaster-General a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid:—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by

a certificated operator, or by a watcher, or by means of the approved automatic apparatus:—

NUMBER AND GRADE OF OPERATORS.

NATURE OF VOYAGE.
(a) Voyage exceeding 48 hours from port to port. Two operators, one of whom shall hold a First Grade certificate.
(b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Board of Trade and the Postmaster-General, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Postmaster-General with the concurrence of the Board of Trade and watchers shall be certificated by the Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid:—

(i) An operator who holds the Postmaster-General's First Class certificate of Proficiency and who has had three years experience as an operator may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these Rules to carry three operators.

(ii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade certificate.

(iii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade certificate.

11. The Postmaster-General may accept certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of September, 1920.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

K N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR SENDING AND RECEIVING.

Summary of Conditions of Issue.

NOTE.—All sending stations must also be equipped for reception.

1. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be furnished if possible, but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals on behalf of the company, etc. Any permit granted will be issued in his name, and he will be personally responsible for the observance of its terms.

2. The installation shall be subject to the approval of the Postmaster-General, and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some definite object of scientific value or general public utility. If scientific research is intended they should be certified as competent investigators by a Government department or some recognised scientific body.

5. Each sending station must be under the charge of a person who has satisfied the Postmaster-General, by examination or otherwise, that he has attained:—

(a) A sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.

(b) An operating speed of at least 12 words (Morse) a minute, sending and receiving.

A fee of 5s. will be charged for the examination referred to above when necessary.

The person in charge of a sending station must also make himself acquainted with the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. This information is contained in Section V of the Postmaster-General's Handbook for Wireless Operators, which may be obtained through any bookseller, or direct from the Stationery Office, price 9d., postage 2d.

A licensee not possessing the necessary operating qualifications may be allowed, exceptionally, to employ a qualified operator to work the sending apparatus.

6. Small fees are payable in order to cover the Post Office expenses in connection with the grant of a permit and subsequent inspection, etc., of the station. For each station authorised to use power up to 10 watts the charges, which will cover the use of receiving as well as sending apparatus, will comprise an initial licensing fee of 10s. plus an annual fee of £1, payable in advance (i.e. 30s. for the first year and £1 for each succeeding year). Higher fees will be charged for more powerful stations.

7. *Aerials*.—Combined height and length not to exceed 100 feet.

8. *Portable Stations*.—General conditions same as for fixed stations.

Power of portable sending stations will usually be limited to 10 watts.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless sending and receiving apparatus should complete the form of application forwarded herewith and return it to The Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, etc.

The fee should not be forwarded until formal application is made for it.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

L N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR RECEIVING.

Summary of Conditions of Issue.

1. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be furnished if possible; but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals. Any permit granted will be issued in his name, and he will be personally responsible for the observance of its terms.

2. The installation shall be subject to the approval of the Postmaster-General, and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some object of scientific value or general public utility and that they are competent to carry out experiments in wireless reception.

5. The apparatus shall be used in such a manner as to cause no interference with other stations. In particular, between the hours of 5 p.m. and 11 p.m. on week days and all day Sunday, any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be directly coupled with the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled with the aerial secondary circuit over the range of wavelengths between 300 and 500 metres is similarly restricted.

That is to say :—

(1) Any reactive arrangement or a separate heterodyne oscillator may be used directly coupled with the aerial or the aerial secondary circuit on all waves at all times, with the exception of the range of wavelengths between 300 and 500 metres provided no interference is caused with other stations.

(2) For the range of wavelengths between 300 and 500 metres—

(a) The use of reaction or a separate heterodyne oscillator as in (1) is permissible between the hours 11 p.m. and midnight and from midnight till 5 p.m., Sundays excluded.

(b) The use of reaction or a separate heterodyne oscillator directly coupled with the aerial or the aerial secondary circuit is not permissible between the hours of 5 p.m. and 11 p.m. on weekdays and all day Sunday. If the use of reaction or a separate heterodyne oscillator is desired on these waves during these hours, the reaction or separate heterodyne oscillator must be so arranged that a valve is interposed between the aerial circuit or circuits and the circuit with which the reaction or separate heterodyne oscillator is coupled.

6. A fee of 10s. in respect of each experimental station is payable annually in advance so long as the license remains in force.

The period covered by the first payment expires as follows :—

If the license is taken out during the three months ended :

31st March—on the 31st December in the same year.

30th June—on the 31st March in the following year.

30th Sept.—on the 30th June in the following year.

31st. Dec.—on the 30th September in the following year.

7. *Aerials*.—Dimensions allowed are as follows : Combined height and length not to exceed 100 feet.

8. *Portable Stations (i.e., field stations)*.—General conditions same as for fixed stations.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless receiving apparatus should complete the form of application forwarded herewith and return it to The Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, etc.

The fee should not be forwarded until formal application is made for it.

Regd. No.

WIRELESS TELEGRAPHY ACT, 1904.
APPLICATION FOR AUTHORITY TO USE RECEIVING APPARATUS.

N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy may be installed or worked.

1. (a) Name of applicant (with Christian names in full)

Age

Occupation

Address

(b) Is the applicant a British subject? (Evidence of British nationality and two written references as to character should be enclosed)

(c) If the applicant is under 21 years of age the following questions should be answered :—
* Name of parent or guardian (with Christian names in full).

Whether British subject or not (evidence and references as under 1 (b) to be furnished)
Relationship (if any) to applicant.

Occupation

Address

2. (a) Scientific qualifications (if any) of applicant

(b) Particulars of any experience in working wireless apparatus.

(c) Particulars of any certificate of proficiency in radiotelegraphy from the Postmaster-General and service in wireless branches of Navy, Army, or Air Force.

3. Full address of the station or stations at which wireless apparatus would be installed

4. Particulars of the nature and object of the experiments which it is desired to conduct with the apparatus.

(General statements such as "Wireless Telephony," "Improvements in efficiency," etc., are not sufficient.)

5. Is it desired to use one station for the reception of programmes transmitted by British broadcasting stations?

†6. Description of apparatus to be used.

†7. Sketch of aerial which it is desired to use (showing height and dimensions, including leading-in wires).

Signature of applicant.

Date.

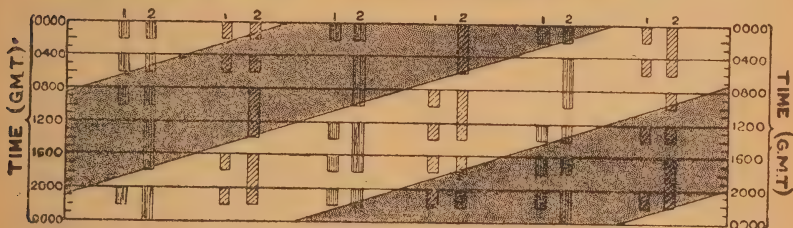
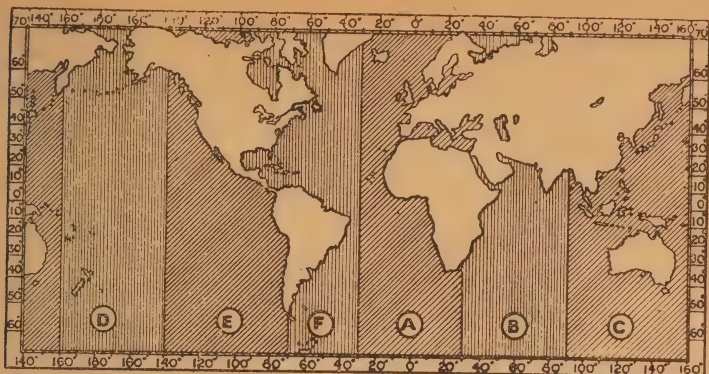
Counter signature of parent or guardian if the applicant is a minor :—

.....
Date

* If the applicant is under 21 years of age, a permit granted will be issued in the name of his parent or guardian, who will be personally responsible for the observance of its terms. Evidence of British nationality and references should be furnished both in respect of the applicant and of his parent or guardian.

†(In the case of portable (outdoor) stations, the proposed area of operation should be stated. This should be defined as within a radius of 10 miles of a specified point.)

‡N.B.—If more than one station, give particulars in respect of each station.



GENERAL POST OFFICE,
LONDON, E.C.1.

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Your reference.
P.O. reference;
All communications
should be addressed
to—

"The Secretary,
General Post Office."

Sir,

RECEPTION OF WIRELESS SIGNALS.

With reference to your letter of the 1st am directed by the Postmaster-General to say that, pending the issue of a formal license, he authorises you, on the conditions specified overleaf, to install and use a station for receiving wireless signals for experimental purposes at

This permit is subject to withdrawal or modification at any time, either by specific notice in writing sent to you by post at the address shown above or by means of a general notice in the *London Gazette* addressed to all holders of licenses for experimental wireless telegraph receiving stations.

I am, Sir,

Your obedient Servant,
for the Secretary.

No. 529.

(Rev'd. 114114/22).

CONDITIONS.

1. The licensee shall not allow the station to be used for any purpose other than that of receiving messages.

2. The station shall be subject to the approval of the Postmaster-General and shall be open to inspection at all reasonable times by duly authorised officers of the Post Office.

3. The combined height and length of the external aerial (where one is employed) shall not exceed 100 feet.

4. The station shall not be used in such a manner as to cause interference with other stations. In particular, between the hours of 5 p.m. and 11 p.m. on weekdays and all day Sunday, any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be directly coupled with the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled with the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres is similarly restricted.

5. The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever of any message received by means of his apparatus, except messages in connection with his experiments received from another experimental station, time signals, musical performances and messages transmitted by any station in Great Britain for general information.

6. A fee of 10s. is payable annually in advance so long as the license remains in force.

The period covered by the first payment expires as follows:—

If the license is taken out during the three months ended—

31st March—on the 31st December in the same year.

30th June—on the 31st March in the following year.

30th Sept.—on the 30th June in the following year.

31st Dec.—on the 30th September in the following year.

7. Any breach of the foregoing conditions will render it necessary for this permit to be cancelled.

M EXTRACT FROM CONVENTION RELATING TO INTERNATIONAL AIR NAVIGATION (1919):—

ART. 14.—No wireless apparatus shall be carried without a special license issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special license for the purpose.

Every aircraft used in public transport and capable of carrying ten or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

N LICENSE TO ESTABLISH WIRELESS TELEGRAPH AIRCRAFT STATIONS.

To all to whom these presents shall concern.

I, the Right Honourable

His Majesty's Postmaster-General send greeting:

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the United Kingdom or in any British aircraft except under and in accordance with a license granted in that behalf by the Postmaster-General:

And whereas

(hereinafter

called "the licensee") has applied to the Postmaster-General for the grant of a license to establish instal and work apparatus for wireless telegraphy as defined in Section I (7) of the Wireless Telegraphy Act 1904 at the aircraft station or stations mentioned in the First Schedule hereto:

Now I the above-named

His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the thirty-first day of December one thousand nine hundred and unless and until these presents and the license or permission hereby given shall be determined as hereinafter provided license and permission—

I. To establish instal and work for the purposes hereinafter mentioned at the aircraft station or stations specified in the First Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedules hereto (which apparatus is hereinafter referred to as "the licensed apparatus");

II. To send and receive messages by means of the licensed apparatus for the purposes and subject in all respects to the conditions and restrictions contained in the Second Schedule hereto.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means by any system of wireless telegraphy between two or more ships or aircraft of His Majesty's Navy between ships or aircraft of His Majesty's Navy and Naval stations or between a ship or aircraft of His Majesty's Navy or a Naval station and any other wireless telegraph station.

The expression "Government aircraft signalling" means signalling by means of any system of wireless telegraphy between two or more Government aircraft between any Government aircraft and any wireless station or between any Government aerodrome and any other wireless station.

The expressions "the International Telegraph Convention" and the "International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The term "aircraft" includes all balloons, whether fixed or free, airships and flying machines.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this license.

3.—(1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling or Government aircraft signalling.

(2) Whenever the operators at any signal station of the licensees perceive through the medium of the instruments used by them that Naval signalling or Government aircraft signalling is proceeding they shall refrain from using the licensed apparatus until all indication that Naval signalling or Government aircraft signalling is proceeding shall have ceased.

(3) These provisions for the protection of Naval signalling or Government aircraft signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912 so far as they are not inconsistent with the other provisions of this license, the expressions "ship" and "ship station" in the Convention being read as if "aircraft" and "aircraft station" respectively were substituted therefor.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensee shall comply in all respects with all such directions and regulations as may from time to time be given or made by the Secretary of State for Air.

9. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

10. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any Corporation Company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. The licensee shall so far as possible receive from aircraft ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12.—(1) The licensed apparatus at each of the aircraft stations mentioned in the First Schedule hereto shall be worked only by operators holding Air Operators' certificates issued by the Postmaster-General and such operators shall only work the apparatus in accordance with the tenor of the certificate which they hold and subject in all respects to the conditions of this license.

(2) Air Operators' Certificates will be of two classes. A First Class Certificate authorising the holder to work wireless apparatus on aircraft for the sending or receiving of messages in general and a Second Class Certificate authorising the holder to work wireless apparatus on aircraft for the purpose of sending and receiving spoken messages only. Such certificates will be granted to approved natural-born British subjects of such technical proficiency and will be in such form and will be subject to such conditions as the Postmaster-General shall from time to time prescribe and they may be endorsed or withdrawn at the discretion of the Postmaster-General in accordance with the conditions to which the certificates respectively are subject.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license.

14. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or

any of the aircraft stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

15. The licensee shall carry on every aircraft on which an aircraft station is established under this license a print or copy of the license certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the aircraft calls.

16. The licensee shall forthwith pay to the Postmaster-General for and in respect of the license hereby granted a royalty of per annum in respect of each aircraft station at which the licensed apparatus is installed.

17. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licenses powers or authorities.

18.—(1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Air or Police Officer or any other person authorised by the Secretary of State for Air to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service, and in that event any such officer or person so authorised may enter upon any aircraft on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any aircraft on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

19. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

20. In the case of any breach non-observance or non-performance by or on the part of the licensee at any of the provisions or conditions herein contained then and in any such case the Postmaster-General may by notice in writing under his seal revoke and-determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them as to all or any of the aircraft stations hereby licensed and thereupon these presents and the said licenses powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said aircraft stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall

thereafter accrue to the Postmaster-General under any condition or provision herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under: Telegraph Acts or any of them.

FIRST SCHEDULE.

[illegible]

22. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

As witness my hand and seal this
day of _____ one thousand nine
hundred and _____

SECOND SCHEDULE.

PROVISIONS AS REGARDS QUALITIES OF APPARATUS AND CONDITIONS OF WORKING.

1. The licensed apparatus shall be in keeping with scientific and technical requirements as determined by the Postmaster-General from time to time and shall comprise apparatus for sending and receiving messages. The licensed apparatus at each aircraft station shall be properly adjusted in all respects before the aircraft commences its flight.

2. The receiving apparatus at each aircraft station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of messages.

3. The sending apparatus installed at each aircraft station shall be so constructed as to be capable of using waves of 600 metres interrupted-continuous wave (hereinafter referred to as "the Aircraft Ship Wave") and 900 metres continuous wave (hereinafter referred to as "the Aircraft Normal Wave"). It may also be constructed so as to be capable of using the following waves, viz.—220, 300, 450 and 800 metres interrupted-continuous waves and 200 to 500 metres, 650 to 950 metres and 2,000 to 3,000 metres continuous waves: Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres, it must also be capable of using 2,400 metres continuous wave: Provided further that the wavelengths before referred to shall not be used without the written permission of the Postmaster-General.

The use of the Aircraft Ship Wave shall be confined to the system known as interrupted continuous wave (*i.e.*, Tonic Train or modulated by abrupt interruptions) save in the case of exceptional emergency, when, if the use of this system be impracticable the wave may be used for the sending and receipt of spoken messages. The Aircraft Normal Wave shall be used only for continuous undamped waves or for the purpose of sending and receiving spoken messages.

4. The wavelengths referred to in this Schedule shall be measured by the standard of measurement for the time being in use by the Postmaster-General.

5. The sending apparatus installed at each aircraft station may be so constructed as to be capable of varying the wave emitted by an amount equal to but not exceeding 3,000 cycles per second above and below the frequency of the normal wave in use: Provided always that such variation from the normal wave shall be used only—

- (a) When first calling up;
- (b) When communication has not been established when first calling up; or
- (c) In case of distress.

6. The receiving apparatus installed at each aircraft station may be constructed so as to receive waves of any length, but it shall be constructed so as to be capable of receiving messages on the Aircraft Ship Wave and the Aircraft Normal Wave: Provided always that if the sending apparatus shall be capable of using the wavelengths mentioned in paragraph 3 of this Schedule the receiving apparatus shall be so constructed as to be capable of receiving messages on these wavelengths.

7. The input of power to the licensed apparatus shall not exceed 100 watts. Power in continuous wave or interrupted continuous wave sets in the case of valve transmitters in the power in the anode circuit, and in high frequency alternations the power put into the alternator.

8. The licensed apparatus shall not be used except during actual flight or in case of forced landing.

9. The licensed apparatus may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

- (a) Distress signals;
- (b) Meteorological information;
- (c) Forced landings and landing instructions;
- (d) Positions;
- (e) Supply of fuel and spare parts;
- (f) Origin, destination, or course of flight.

10. Except with the written permission of the Postmaster-General, the Aircraft Normal Wave and no other wave shall be used for the sending and receipt of messages to and from—

- (a) Other aircraft stations;
- (b) Ground stations specified by the Secretary of State for Air.

11. Except with the written permission of the Postmaster-General, the Aircraft Ship Wave and no other wave shall be used for the sending and receipt—

- (a) Of messages to and from ships of His Majesty's fleet and merchant ships;
- (b) Of such messages as are rendered necessary by reason of exceptional emergency and not coming within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave.

12. The procedure employed for the sending and receipt of messages to and from each aircraft station and other aircraft stations shall conform to instructions laid down by the Secretary of State for Air. Signed sealed and delivered by in the presence of

On behalf of the Postmaster-General

WIRELESS DIRECTION FINDING STATIONS.

USE BY THE MERCANTILE MARINER.

ADMIRALTY NOTICE TO MARINERS, No. 524 OF 25TH MARCH, 1920.

The following is promulgated for information:—

The Admiralty have recently received evidence from various sources that the existence of Wireless Direction Finding Stations in the United Kingdom, France, Canada, the United States and Germany, and the regulations under which these stations are operated, are not as generally known throughout the Mercantile Marine as is desirable in view of the immense value of the system of wireless direction finding as an aid to navigation, especially in thick and foggy weather.

2. On the other hand, returns rendered by the stations in the United Kingdom show that where the system is known to masters it is beginning to be more extensively used, not only when atmospheric conditions render it impossible to obtain the ship's position by any other means, but as a check on positions obtained by the ordinary method of navigation.

3. Information on this subject was first published in Admiralty Notice to Mariners No. 1,019 of May 23rd, 1919. This Notice has since been revised, and the latest information on the subject is contained in Admiralty Notice to Mariners No. 363 of the year 1920 (reproduced in Board of Trade Notice to Mariners). This Notice should be studied by masters who desire to make use of this system; the procedure to be adopted, which varies to some extent for the different stations and as to the wavelength to be used, is set out therein in detail. It is equally necessary that W/T operators should study the procedure.

4. Briefly put, a ship requiring a bearing calls up the D.F. station or stations from which it is desired to receive a bearing, singly or together, according to the procedure laid down. The station or stations reply with the bearing (true) of the ship from that station.

5. The following stations are established in the United Kingdom: Berwick, Flamborough, Lizard, Carnsore.

6. These stations are operated by the Royal Navy, but are available for the use of the Mercantile Marine.

7. A charge of five shillings (5s.) will be made as from April 1st, 1920, for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

8. Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

9. The accuracy with which bearings can be taken depends on certain conditions outlined in the Notice to Mariners referred to, but, although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given from any failure in the service, or from any other cause whatever.

(Notice No. 524 of 1920, dated March 25th.)

Authority.—The Lords Commissioners of the Admiralty. (H. 2049/20.)

P WIRELESS DIRECTION FINDING STATIONS.

(See under Great Britain in Direction Finding Section.)

Q ADMIRALTY NOTICE TO MARINERS.

No. 952 of JUNE 15TH, 1920.

(See under Great Britain in Direction Finding Section.)

R AIR MINISTRY NOTICE TO AIRMEN.

No. 103 of SEPTEMBER, 30TH, 1920.

(See under Great Britain in Direction Finding Section.)

WIRELESS TELEGRAPHY AND SIGNALLING. A BILL

S To Amend the Wireless Telegraphy Act, 1904, and to make further provision with respect to the regulation of Wireless Telegraphy and Visual and Sound Signalling.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. The Wireless Telegraphy Act, 1904 (hereinafter referred to as the principal Act), shall become a permanent Act, and any provision in any Act in force at the time of the passing of this Act which limits the period for which the principal Act is to remain in force shall cease to have effect.

2. (1) The Postmaster-General may, notwithstanding anything in the principal Act, make regulations—

(a) As to the terms, conditions, and restrictions on or subject to which licenses or any class of license under the principal Act are to be granted, renewed, suspended, or withdrawn; and

(b) Requiring any operators or other persons engaged in the working of wireless telegraphy to be provided with certificates, and making provision as to the manner and conditions of the issue and renewal of any

such certificate, including the examinations and tests to be undergone, and the form, custody, production, cancellation, suspension, endorsement and surrender of any such certificate, whether issued before or after the passing of this Act; and.

(c) For preventing interference with the working of wireless telegraphy by the generation or use of etheric waves for any purpose other than the transmission or reception of wireless messages; and

(d) For giving effect to, and securing compliance with, the provision of any international convention signed on behalf of His Majesty, and any regulations made thereunder, so far as the same relate to wireless telegraphy; and

(e) Prescribing, subject to the consent of the Treasury, the fees to be paid in respect of the grant or renewal of any license or certificate.

(2) Regulations under this section may provide that any person acting in contravention of or failing to comply with the regulations or any of them, or the terms, conditions and restrictions or any of them, on or subject to which any such license or certificate as aforesaid has been granted, shall be liable, on summary conviction, to imprisonment for a term not exceeding three months, or to a fine not exceeding fifty pounds, and, in the case of a continuing offence, a further fine not exceeding five pounds for each day during which the offence continues.

(3) Subsection (6) of section 1 of the principal Act is hereby repealed.

3. Subsection (1) of section 2 of the principal Act, which makes special provision as to licenses for experimental purposes, shall cease to have effect, and licenses for those purposes shall be subject to the general provisions as to licenses for wireless telegraphy contained in section 1 of the principal Act.

4. (1) A person shall not—

(a) Send or attempt to send by wireless telegraphy a message or communication of an indecent, obscene, or offensive character; or

(b) Send or attempt to send by wireless telegraphy a signal of distress of a false or misleading character, or a false or misleading message as to a vessel in distress; or

(c) Improperly divulge the purport of any message sent or proposed to be sent by wireless telegraphy.

(2) If any person acts in contravention of this section he shall be liable on summary conviction to a fine not exceeding ten pounds, or on conviction on indictment to imprisonment for a term not exceeding twelve months.

5. The penalty to which a person is liable on summary conviction for an offence under subsection (3) of section 1 of the principal Act shall be imprisonment for a term not exceeding three months, or a fine not exceeding fifty pounds, and, in the case of a continuing offence, a further fine not exceeding five pounds for each day during which the offence continues.

6. Any provisions of the principal Act or this Act which are applicable to ships, shall apply also to aircraft, with the necessary modifications, and in particular with the following modifications:—

(1) For the reference to British ships in the territorial waters abutting on the coast of the British Islands there shall be substituted a reference to British aircraft in or over the British Islands and in or over the territorial waters abutting on the coast thereof; and

(2) For the reference to British ships whilst on the high seas there shall be substituted a reference to British aircraft outside the British Islands and the territorial waters abutting on the coast thereof; and

(3) For the reference to a foreign ship in territorial waters there shall be substituted a reference to a foreign aircraft whilst in or over the British Islands or the territorial waters abutting on the coast thereof; and

(4) Subsection (5) of section 1 of the principal Act as amended by this Act shall not apply.

7. (1) The provisions of the principal Act as amended by this Act shall apply to any visual or sound signalling station used or intended to be used for the purpose of communication from the British Islands with ships at sea as they apply to wireless telegraphy stations.

(2) For the purposes of this section "visual or sound signalling station" includes any permanent or fixed apparatus for the purpose of visual or sound signalling, and the provisions of the principal Act and this Act shall apply to the maintenance of any visual or sound signalling station in existence at the time of the passing of this Act as they apply to the establishment of a visual or sound signalling station:

Provided that nothing in the principal Act or this Act shall apply to visual or sound signalling stations or apparatus on ships or aircraft, or to any signal station established by Lloyd's under the powers conferred by the Lloyd's Signalling Stations Act, 1888, or to signalling stations and lighthouses under the control of the Board of Trade or of any General or Local Lighthouse Authority.

8. If at any time in the opinion of a Secretary of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission and reception of messages by wireless telegraphy or visual or sound signalling, and notice to that effect is published in *The Gazette*, it shall be lawful for the Postmaster-General during the continuance of the emergency to make such rules as appear necessary with respect to the possession, sale, purchase, construction, and use of apparatus for wireless telegraphy or visual or sound signalling, or component parts of such apparatus, and to impose penalties and forfeitures in respect of any breach of the rules, and make such further provision as appears necessary for the enforcement of the rules:—

Provided that—

(a) Rules under this section shall not provide for the imposition of a term of imprisonment exceeding six months, or a fine exceeding one hundred pounds, or, in the case of a continuing offence, ten pounds for each day during which the offence continues; and

(b) Any rules made under this section shall be laid as soon as may be before both Houses of Parliament.

9. The principal Act as amended by this Act shall not extend to British ships or British aircraft registered outside the British Islands, except that any such ships or aircraft shall whilst in or over the British Islands or the territorial waters abutting on the coast thereof, be subject to the provisions of the principal Act as so amended with respect to foreign ships and aircraft in like circumstances.

Provided that if after the establishment of the Irish Free State the legislature thereof makes other provision with respect to ships and aircraft registered in the Irish Free State and with respect to ships and aircraft when in or over the Irish Free State, or the territorial waters abutting on the coast thereof, the foregoing

provisions of this section shall have effect as if the expression "British Islands" did not include the Irish Free State, and the principal Act as amended by this Act shall cease to apply to foreign ships and aircraft when in or over the Irish Free State or the territorial waters abutting on the coast thereof.

10. (1) This Act may be cited as the Wireless Telegraphy and Signalling Act, 1922, and shall be construed as one with the principal Act, and the principal Act and this Act may be cited together as the Wireless Telegraphy and Signalling Acts, 1904 and 1922.

(2) Any reference in this Act to the principal Act or any provision thereof shall, unless the contrary intention appears, be construed as a reference to that Act or provision as amended by this Act.

T BROADCAST LICENSE.

WIRELESS TELEGRAPHY ACT, 1904.

License to Establish a Wireless Receiving Station.

Mr.
of
is hereby authorised (subject in all respects to the conditions set forth on the back hereof) to establish a wireless station for the purpose of receiving messages at
for a period ending on the next.
The payment of the fee of ten shillings is hereby acknowledged.

Dated day of 192
Issued on behalf of the Postmaster-General

.....
for Postmaster.
Signature of Licensee

Stamp of
Issuing Office.

If it is desired to continue to maintain the station after the date of expiration a fresh license must be taken out within 14 days. Heavy penalties are prescribed by the Wireless Telegraphy Act, 1904, on conviction of the offence of establishing a wireless station without the Postmaster-General's license.

CONDITIONS.

1. The licensee shall not allow the station to be used for any purpose other than that of receiving messages.

2. Any receiving set, or any of the following parts, viz.: Amplifiers (valve or other), telephone head receivers, loud speakers and valves, used under this license must bear the mark shown in the margin.

3. The station shall not be used in such a manner as to cause interference with the working of other stations. In particular valves must not be so connected as to be capable of causing the aerial to oscillate.

4. The combined height and length of the external aerial (where one is employed) shall not exceed 100 feet.

5. The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever, of any message received by means of the station other than time signals, musical performances and messages transmitted for general reception.

6. The station shall be open to inspection at all reasonable times by duly authorised officers of the Post Office.

7. This license may be cancelled by the Postmaster-General at any time either by specific notice in writing sent by post to the licensee at the address shown hereon, or by means of a general notice in the *London Gazette* addressed to all holders of wireless receiving licenses for broadcast messages.

N.B.—Licenses may only be held by persons who are of full age and any change of address must be promptly communicated to the issuing Postmaster.

A.....

GENERAL POST OFFICE.

U *Conditions which Broadcast Receivers should fulfil to obtain Post Office approval.*

1. That all types of broadcast receivers may be constructed for the reception of signals of any wavelength.

2. That the apparatus shall be so constructed that it is difficult to change the arrangement of the circuits embodied in the design by means of external connections.

3. The following units, each of which must consist of apparatus assembled connected and mounted in a single container, shall be approved.

(a) Combined tuner and rectifier.

(b) Combined tuner, high frequency amplifier and rectifier.

(c) Audio frequency amplifier (of valve or other type).

(d) Tuner, rectifier and audio frequency amplifiers.

(e) Tuner, high frequency amplifiers, rectifier and audio frequency amplifiers.

In particular it is intended that each panel must contain all the high frequency circuits and the high frequency amplifiers in association with the rectifier, but there is no limit to the number of high frequency or audio frequency amplifiers that may be included in any unit or set provides the other conditions set forth herein are complied with. Audio frequency amplifiers may be added in single, double or multiple units to (a) and (b).

4. No receiving apparatus for general broadcast purposes shall contain a valve or valves so connected as to be capable of causing the aerial to oscillate.

5. Where reaction is used on to the first receiving circuit it must not be adjustable, but must be fixed and incapable of causing oscillation.

6. Where reaction is used between a second or subsequent valve on to the anode circuit of a valve connected to the aerial, either directly or inductively, and no specific coupling tending to produce oscillations in the aerial is provided between the first receiving circuit and the first anode circuit, the reaction may be adjustable.

7. Tests of sets will be made on two aerials, one 30 feet long and the other 100 feet long. On these aerials the sets should be capable of receiving on wavelengths covered by the "Broadcast" band, viz., 350 to 425 metres.

8. The sets will be tested for the production of oscillations in the aerial, and for interference properties with a factor of safety, i.e., increasing the high tension battery by about 30 per cent., changing valves, etc., but not by altering any soldered connections.

9. The Postmaster-General must be satisfied that sets containing reaction can be reasonably repeated with consistent conditions.

10. After approval, the type will be given a Post Office registered number, and makers must see that the sets fulfil the non-interfering conditions before they are sold. All sets sold for use under the broadcast receiving license shall bear the registered trade mark of the British Broadcasting Company and the Post Office registered number.

11. The unit or set approved as the pattern instrument of a type shall be retained without alteration by the maker. The Postmaster-General shall have the right at any time to select any set of an approved type for test to set that the set is reasonably similar to the approved pattern. In the case of sets of an approved type employing reaction being found to oscillate the aerial, the Post Office may cancel the authorisation of the future sale of that type. No change in the design of any set or unit may be made after approval without the previous sanction of the Postmaster-General.

Note.—The approval of the Postmaster-General does not carry any implied guarantee of the quality, workmanship or sensitivity of the apparatus.

Firms desiring to submit sets for approval and registration should send a sample set of each type, together with relative wiring diagrams, to the Engineer-in-Chief, Wireless Section, General Post Office West, London, E.C.1. After tests the firms will be notified of the result and advised that the sets are ready for collection.

GREECE

(Sec also Map Section)

Including: Crete.

ONE of the oldest maritime countries in the world, the kingdom of Greece lies in latitude $34^{\circ} 45' 43''$ N., its longitude stretching between $19^{\circ} 20' 28''$ to 30° E. George II. is the reigning king.

The State consists of Macedonia, Epirus, Crete, and other Ægean Islands. It has an area of 16,919 square miles, with a population of 2,646,913.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
I. Leonidas	Minister of the Navy	11, Kriezotou St., Athens
Com. Leonidas Theoharis	Head of the Wireless Telegraph Service of the Royal Hellenic Navy	—
Cap. R.N. C. Malamos	Head of the Radiotelegraphic Service	10, Mavrokordatou St., Athens
Com. R.N. Gr. Mezeviris, Radio Engineer of the "Ecole Supérieure d'Electricité"	First Assistant to Head of Radio Service	24, Ithakis St., Athens

ORGANISATION.

The Greek Ministry of the Navy, following the lead of other countries, took up the question of wireless seriously in 1909, when Capt. Athanasiadis, the late head of the Radio Service (an officer of the Navy), was sent to England at the head of a Mission for the construction of different stations. The first wireless land station was erected at Athens, and completed in February, 1911, and several other stations were installed on ships of the Navy. It was only during the Balkan War (1912-1913) that other land stations were erected, the Athens station being the only land station in Greece up to that moment.

A new scheme of coast wireless stations has been laid down, and is to be completed within four years. This scheme includes more than twenty stations. A powerful station will soon be completed near Athens, communicating direct with all other European countries.

The transmission of meteorological, aviation and time signals is shortly to be placed on a new basis.

Wireless Societies or Clubs.—The Union of Greek Telegraphists is the only organisation of persons interested in wireless.

The Société Anonyme Internationale de Télégraphie sans Fil of Brussels is the only company erecting and working stations on merchant ships.

ADMINISTRATION.

A—Law, 1831, passed January 14th, 1920.

B—Regulation on the Wireless Service of the Merchant Fleet.

C—Form of Ship License.

D—Form of Radio-operator's License.

LAW 1831.

A Concerning the organisation of the Radiotelegraphic and Radiotelephonic Service of the State and the formation of a Directorate of Radiotelegraphic Service of the Navy.

Passed, January 14th, 1920

CHAPTER A.

General Clauses concerning the Radiotelegraphic and Radiotelephonic Service of the State.

ART. 1.—The installation and operation of Radiotelegraphic and Radiotelephonic Stations on Hellenic territory and on board Hellenic ships constitutes a State monopoly.

ART. 2.—The State may grant permission to private individuals to instal and operate radio-stations on land and on board ships under conditions specified in the license. Any such licence may be revoked or the conditions under which same has been granted be altered when the station interferes with the working of Government Stations or does not fulfil the conditions under which the license has been issued.

In time of mobilization of the naval or military forces the license for the operation of private stations may be revoked without notice.

The State may take possession of private stations for its own use in mobilisation time after paying compensation as mentioned in the license.

The State reserves to itself the right to purchase any private station in time of peace and if the license be revoked in accordance with the first paragraph of the present article after a certified decision of the permanent advisory board as in Article 8, compensation is fixed by a council of arbitrators composed of three members, one chosen by the competent Ministry, the second by the owner, and the third by the President of the Athens Court of Appeal.

If more than one owner is interested and these do not agree as to the choice of an arbitrator, each of them shall propose one, and the arbitrator shall be chosen from them by ballot in the presence of the arbitrator chosen by the President of the Court of Appeal.

Such a Council settles definitely any dispute regarding compensation due for the temporary seizure of the station.

ART. 3.—Radiotelegraphists operating private wireless stations must be in possession of a licence issued by the State after successful examination, and undertake the obligation to preserve the secrecy of correspondence.

Licenses are valid for a term of three years and a stamp of 10 Drs. is affixed to them. When Greek subjects are concerned, the application for the issue of the license must be accompanied by certificates proving that the applicant is not a deserter from Government Forces and has not been convicted in accordance with Article 22 of the Penal Code.

Licences for Radiotelegraphists issued before the promulgation of this law are not valid after the lapse of one year.

ART. 4.—Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

1. Every person who establishes a radio-station or sets any radio-apparatus on land or on board ship without a license.

2. Any person employing an operator not holding a State license.

3. Any person violating the terms under which the license of installation of wireless station has been granted.

4. Any person who sends or transmits any fraudulent distress signal or who without lawful excuse interferes with or obstructs any radio communication of other stations as well as persons exhorting operators to transmit such signals.

5. Any person causing damage or destruction to the radio-apparatus.

6. Any person violating the regulations in force.

7. Any person violating the due secrecy of the radio communication.

The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excluding any penalty provided by the Penal Code or by the Military Penal Code in the event of a Military case.

The same Court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

In addition to the above penalties the Minister can order when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

The license of an operator punished by the Court for one of the above cases is suspended temporarily or permanently on the judgment of the Court. Should the competent Minister think that the infringement effected by the operator is not serious as to demand action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his license for a period not exceeding three months.

ART. 5.—The land stations of the State are divided into two classes :—

(a) Inland Radio-stations for the transmission of official or private correspondence with ship stations or other Inland or Coast Stations of the State or Stations abroad providing that there are no private Wireless Stations.

(b) Shore or Coast Radio-stations for the transmission of official or private correspondence to ships or other coast and land stations in the State or abroad; providing that there are no private stations for wireless correspondence.

The Government stations on board ships are divided into two classes :

(a) Stations on board warships.

(b) Stations having been specially installed by the State on board merchant ships, exempted by the present law for the ships, particular use.

ART. 6.—All wireless telegraphic subjects come under the special jurisdiction of the Ministries of Marine, of Communications, and of National Economy, who are kept *au courant* with wireless telegraphic questions in connection with merchant shipping by their representative and member to the Advisory Board (provided for by Article 8). The Director of the Merchant Shipping Department, or by direct communication of the Marine Minister providing special arrangements are made.

The following come under the special jurisdiction of the Minister of Communications :—

(a) The installation and operation of the land stations.

(b) The issue of licenses for the installation and operation of private land stations, the inspection and supervision of their operation, the observance of the regulations in force and the conditions stipulated in the license, of these stations upon decision of the board provided for in Article 8.

(c) The control and payment of accounts for private radiograms transmitted by stations under his jurisdiction, or that of the Minister of Marine who in turn transmits full information concerning the subject.

For this purpose the staff of the office of the Ministry of Communications shall be fixed by special Royal Decree.

The following come under the jurisdiction of the Ministry of the Navy :—

(a) The installation and operation of the coast stations, of warship stations, and stations of the State on merchant vessels.

(b) The issue of licenses for the installation and operation of private stations on merchant vessels and private coast stations after consultation with the Advisory Board, the inspection and supervision of their operation, the observance of the regulations and conventions in force and conditions stipulated in the license of the station.

(c) The issue of licenses to the operator of all stations.

(d) The control of ships or land stations and the observance of rules and conventions shall be fixed by Royal Decree and special regulations.

(e) As coast or shore stations are considered all stations installed a small distance from the coast if they keep up Naval radio-communication.

ART. 7.—Temporarily and until the formation of a Technical Service has been effected at the Ministry of Communications all matters under its jurisdiction except those stipulated in Chapter C will pertain to the Ministry of Marine.

A permanent Advisory Board is established at the Ministry of the Navy, composed of the Head of the General Staff of the Navy, as Chairman, the Director of Posts and Telegraphs, the Director of the Radio-Service of the Navy, the Head of the Radio Department of the Ministry of Communications, and one officer of the Army General Staff appointed by the Chief of the Staff, and of the Director of the Merchant Shipping Department in the Ministry of National Economy.

This Board considers :—

(a) The necessity for the erection of land stations.

(b) The issue of licenses for the installation of private stations in the interior or on the coast and the cancellation of such licences.

(c) Matters pertaining to International Conventions.

(d) Questions arising between different services.

(e) Any relative matter brought forward by the Ministers of the Navy and Communications or of the Ministry of National Economy.

ART. 9.—The coast station charges and ship charges are fixed by Royal Decree according to circumstances after the consultation with the Advisory Board.

CHAPTER B.

CONCERNING THE RADIO-SERVICE ON BOARD MERCHANT SHIPS.

ART. 10.—All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation :—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by $34^{\circ} 0'$ to $42^{\circ} 20'$ north latitude and the meridians $17^{\circ} 0'$ to $30^{\circ} 0'$ east of Greenwich, Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram, may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article, there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry ship-wrecked or other persons.

ART. 11.—The power of the wireless sets provided for in the foregoing article will be defined in the license and shall be able to transmit signals clearly under normal circumstances at a distance of at least 100 nautical miles in addition they shall be equipped with an emergency gear which elements shall be under the greatest safety conditions.

ART. 12.—The clearance of ships, subject according to Article 10 to carry a wireless set, and not being fitted therewith, is prohibited by the harbour authorities. The acceptance of Greek passengers on ships of foreign nationality which are not equipped with wireless is also prohibited for voyages where Greek ships are required to be equipped.

ART. 13.—Merchant ships exempted from the obligation to be fitted with a wireless set, may be fitted with State apparatus for purposes of the War-Navy. All expenses of installation and maintenance of the necessary staff for the operation being reserved to the competent Ministry.

ART. 14.—All ship radio-charges are deducted from the general radio-charges and belong to the shipowner or to any person having the exploitation of the radio-station under special arrangement with the shipowner.

In cases where the ship helps in salvage or affords assistance to another ship in consequence of a radiogram the shipowner is required to pay to the State 10% of the net sum which he obtains for salvage, but only if the apparatus belongs to the State. This sum being devoted to the Naval *Caisse des Invalides*.

CHAPTER C.

CONCERNING THE RADIO-SERVICE OF THE NAVY.

ART. 15.—A Direction of Radio-Service of the Navy is formed in the Ministry of the Navy under the immediate orders of the Minister of Marine and to which, in addition to matters specified in Article 6 of this law, are subject: The enlistment, training, appointment and alterations of the staff serving on stations subject to the jurisdiction of the Ministry of the Navy or any other relative matter to be fixed by Royal Decree.

(Further articles concern the special service of the Naval Radio-Corps.)

REGULATION OF WIRELESS SERVICE ON MERCHANT SHIPS.

CHAPTER I.

SHIPS BOUND TO BE FITTED WITH RADIO-TELEGRAPH INSTALLATION.

B 1. All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage, if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation:—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by $34^{\circ} 0'$ to $42^{\circ} 20'$ north latitude, and the meridians $17^{\circ} 0'$ to $30^{\circ} 0'$ east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry ship-wrecked or other persons.

2. The power of the wireless station on merchant ships is fixed by the Direction of the Radiotelegraphic Service of the Navy (D.R.S.N.), and is prescribed in the license according to the voyages undertaken by the various ships. As a minimum limit should be taken the clear transmission of signals to a distance of at least 100 naval miles under normal conditions. In addition merchant ships must be fitted with an emergency set, the whole system of which must be kept in the safest condition. The accumulators must be placed out of the wireless cabin and if possible in the open air in dry cases. The wireless cabin must be connected with the bridge by some safe means assuring verbal communication.

3. Each shipowner, obliged by this law to instal a radiotelegraph station on his ship, must submit an application to the D.R.S.N. (Inspection Department) for the necessary licence.

In the application the following items of the ship must be prescribed:—

- (1) Dynamo—how moved and where placed.
- (2) Masts—distance between and height.
- (3) Capacity (deadweight).
- (4) Passenger or cargo.
- (5) Number of crew.
- (6) Voyages undertaken.
- (7) System of the radiotelegraphic station to be installed.
- (8) Length of aerial.
- (9) Wave system.
- (10) Wavelengths used.
- (11) Emergency set.

After the installation the shipowner submits to the D.R.S.N.:—

- (1) Small drawing of the aerial.
- (2) Small drawing of the connections.
- (3) Disposition of the set in the cabin.

The responsibility for the accuracy of these certificates is borne wholly by the shipowner.

The D.R.S.N. on granting the necessary license can accept the above items or change them, the shipowner being obliged to comply with the suggestion of the D.R.S.N.

4. Shipowners not bound by law and wishing to instal a radio set on their ships must apply by a similar application as above.

5. The D.R.S.N. on granting a license assigns the call letters to the station.

6. Merchant ships are divided into three classes, A, B, C, as regards the wireless installation:—

Class A.—To this class belong all the passenger ships travelling at a distance of more than 200 miles from the coasts. The ships of this class must be in permanent watch.

Class B.—To this class belong all other ships which are bound by law to be fitted with a radiotelegraphic installation; the ships of this class are bound to keep limited watch during the voyage which is regulated in accordance with the needs of the voyage. In any case the station of these ships must be in watch the first ten minutes of each hour.

Class C.—To this class belong all ships fitted with wireless installation without being bound by law. The station of these ships have no fixed watches.

CHAPTER II.

SERVICE OF WIRELESS STATION ON MERCHANT SHIPS.

9. The wireless stations service of Greek merchant ships must be carried out by telegraphists holding a Greek license granted in accordance with Law 1831 by the D.R.S.N.—

10. The stations of ships of class A are served by two operators at least, holding a first-class license.

11. The stations of ships of class B are served by at least one operator holding a first-class license.

In cases where no second operator is carried a member of the crew must be able to understand the distress signal or the call of another station, so that he may at once inform the telegraphist.

Such skill of the said man of the crew shall be tested and mentioned in the respective report of the Wireless Inspector.

12. The station of a ship of the C class must be served by at least one operator holding a second-class license.

13. The operator of the ship in charge of the station is responsible for the regular carrying out of the service, the keeping up of books, the cleaning and maintenance in good order of the apparatus. The other operator must obey him.

14. Each merchant ship station must be supplied with the following papers:—

(1) The license for the installation.

(2) A copy of the present Wireless Regulation and of any other subsequent or of any circular concerning the radiotelegraphic service.

(3) A copy of the International Wireless Convention and of annexed regulation.

(4) The official list of wireless stations and alphabetical list of call letters.

(5) Radiogram prints.

(6) A copy of the standing wireless and cable rates and the protocol of the wireless station.

(7) A log-book for the wireless station.

The operator will state from time to time on a slate placed out of the wireless cabin the coast station with which he is in touch.

15. The operator on service shall keep in a log-book of the station a record of all orders received and all other observations connected with the wireless service and any infringement of the regulations.

The log-book of the station will be considered as an official document and it is forbidden to detach leaves therefrom or to use erasers on its pages. It may thus serve as means of proof before the courts and the competent authorities.

16. The wireless station on a merchant ship and the operators serving it are under the direct orders of the captain who regulates their watch on his own responsibility. But the operator is responsible for any signal or call of the station or any message which he receives and has not passed in the protocol of the station.

17. The captains of the merchant ships must take the necessary steps to secure during the voyage the necessary electric power for the transmitting set for the regular service of the station.

18. When the captain, on his own responsibility, forbids communication or orders silence to a station's call, or in general gives orders to the operator contrary to the regulations or hinders the operator in the fulfilment of his duties in any way, the latter must call the captain's attention to the fact, and if the captain insists, the operator must obey stating the fact in his log-book, and as soon as the ship arrives at a Greek port he must report the case to the wireless inspector or in the latter's absence to the harbour master.

19. The correspondence and the service in general of merchant ships is carried out in accordance with the regulations annexed to the International Radiotelegraphic Convention of London and with the present regulation, as well as with any other order of the D.R.S.N.

Operators are also bound to carry out all orders and to comply with the instructions given by the wireless inspector.

20. On no account may a ship station use other call letters than those prescribed in the licence.

21. The transmission of radiotelegrams in harbours or bays in the proximity of coast stations is prohibited.

22. Merchant ship stations are bound to suspend transmission as soon as a coast station requires it. As a general rule the ship stations must comply with the orders given by the coast stations.

23. In time of mobilisation or Naval manoeuvres the ship stations must conform to the instructions given by the Greek Navy.

24. Before leaving port the operator in charge of the station must try the working condition of the main and emergency set. This test, however, is carried out by disconnecting the aerial. Whenever the operator thinks it necessary to verify the radiation of the station and its emergency set or the sensitivity of the receiver he applies for it, using the international abbreviation.

25. The operators in charge of merchant ships are bound when they proceed to a Greek harbour, to report at once to the wireless inspector or to the harbour officer all deficiencies of the station and in his personnel.

26. The captain is bound at specified intervals not exceeding four hours to give the operators the position of the ship which is to be constantly suspended under their view in the receiving cabin.

27. The operator receiving (by any means) knowledge of a message dangerous to the interests of the country must report it at once to the captain and to the nearest Government coast station or warship or harbour authorities, and simultaneously must draw up a report embodying the message, the station in communication, and full information on it, which he forwards to the D.R.S.N.

28. If the wireless operator receives a suspicious message for transmission from a passenger, before transmitting it he must ask the permission of the captain.

29. It is forbidden for operators to undertake service at a station not fitted with a regular license.

30. All operators must carry their license in the ship to which they belong.

37. It is forbidden for operators to maintain communication by wireless on subjects not referring to the wireless service.

32. Whenever the operator hears any infringement of the rules, effected by other stations he must report at once the fact with all necessary particulars to the D.R.S.N. and he will record in his log-book exactly what he has heard.

33. It is absolutely forbidden for a third station to interrupt two stations already communicating.

34. As a general rule wireless operators must constantly recognise that it is of their duty to enable the wireless communication to be carried out regularly and not to be absorbed exclusively by the finishing up of their service in the station they belong to.

35. It is forbidden to every person not concerned in the service of the station to enter the wireless cabin.

36. Captains are bound to supply the necessary personnel for the cleaning of the station and the repair of the aerial and of the set and generally to grant all assistance for the maintenance and regular service of the station.

37. Merchant ships operators hold officer's rank of the merchant fleet.

38. Operators on finally landing from a merchant ship must present their license to the captain before landing who endorses on it the capacity and character of the operator as shown during his service period.

CHAPTER III.

PENALTIES FOR THE VIOLATION OF THE LAW AND THE REGULATION.

39. Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

(1) Everyone who establishes a wireless station or sets any radiotelegraphic apparatus on land or ship without a license.

(2) Any person employing an operator not holding a State license.

(3) Any person violating the terms under which the license of installation for wireless has been granted.

(4) Any person violating the regulations in force.

(5) Any person who sends or transmits any false or fraudulent distress signals or who without lawful excuse interferences with or obstructs any radio communication of the station.

(6) Any person causing damage or destruction to the radiotelegraph apparatus.

(7) Any person violating the due secrecy of the radio communication.

(8) Any person violating generally any regulation of the rules in force.

40. The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excepting any penalty provided by the penal code or by the military penal code in the event of military case.

41. The same court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

42. In addition to the above penalties the Minister can order when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

43. The license of an operator punished by the court for one of the above cases is suspended temporarily or permanently on the judgment

of the court. Should the competent Minister think that the infringement effected by an operator is not so serious as to demand such action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his license for a period not exceeding three months.

CHAPTER IV.

INSPECTION OF THE WIRELESS STATIONS OF MERCHANT SHIPS.

44. In harbours specified by order of the Minister of Marines there are centres for inspection of wireless in active service.

45. In these centres there are Inspectors of the corps of the wireless operators of the War-Navy to superintend the application of Law 1831, of the International Convention and the Regulations for Wireless Telegraphy which are in force.

46. The Inspectors communicate directly with the harbour officers and co-operate with them in order to enforce the law.

47. The Wireless Inspectors, or failing them, the harbour officers, inspect the ships affected by the law before their departure and verify whether they are fitted with wireless as well as with the necessary personnel and the class of operators in accordance with the law and the present regulations.

48. The Wireless Inspector who discovers an infringement of the law or the regulations reports it simultaneously to the harbour master who either prevents the leaving of the ship in accordance with law or reports the infringement effected to the D.R.S.N. asking for the suspension of the responsible operator or the imposition of a penalty according to the nature of the infringement effected.

The Harbour Master accompanies such report with a detailed report concerning the transgression committed, signed by him and the Wireless Inspector, and if need be accompanied by a sworn statement to this effect, which he may obtain from any person acquainted with the fact. He also submits any other item which might be useful to the court.

49. If the inspection of the ship station is impossible the Inspector or the Harbour Officer can ask for a written statement from the captain testifying that the station is maintained in good condition.

50. The Wireless Inspector can accept as a proof of the efficiency of the set and the capacity of the operators of the ship under examination, radiograms transmitted or received during the lapse of the last voyage to the harbour where they are from a distance of at least 100 miles.

51. For any obstruction or difficulty caused by the captain or other person of the ship with regard to the service and the duties of the Inspectors or the Harbour Officers the captain of the ship will be held responsible and against whom the Harbour Master may at once order legal proceedings to be taken.

52. The captain is responsible if he sail from any harbour where there is an Inspector without having his wireless installation in order or the requisite number of operators.

53. All consequences of the law concerning the infringement of the regulations will be enforced against the captain or the shipowner or against both according to the circumstances.

FORM OF SHIP LICENSE.

KINGDOM OF GREECE.

No.

DIRECTION OF THE NAVAL RADIOTELEGRAPH
SERVICE.

C In accordance with Law 1831, with the London Wireless Convention of 1912, and with the Regulations on the Wireless Service of the Merchant Fleet, we grant the license for the erection and

operation of wireless station on board s.s. of tons
deadweight, registered at
Belonging to
The technical particulars of the station are as follows:—
Station Class Call letters
Power System
Aerial length Wavelength
Receiver
Emergency set
Electric power
Staff

Back Part.

Locality and date of birth.....

Remarks

Signature.....

PHOTO

SERVICE. CONTROL.

Station Name.	Service Time.	Remarks.	Signature of person in charge or of the Captain.

The operation of the station is subject to the provisions of the above laws, conventions and regulations, as well as to provisions of all regulations issued by the Direction of the Naval Radiotelegraph Service.

The present license is valid as long as the London Convention of 1912 is in power, and is revocable for any case referred to in Law 1831.

Athens, the.....19..

The Director of the Naval Radiotelegraph Service.

KINGDOM OF GREECE.

No.

DIRECTION OF THE NAVAL RADIOTELEGRAPH
SERVICE.

OPERATOR LICENSE.

..... CLASS.

D Mr. has been examined successfully on the following matters:—

(a) Operation and regulation of apparatus.

(b) Transmission and reading of signals at a speed of at least..... words per minute.

(c) Knowledge of the regulations on the wireless communication.

The above-mentioned has undertaken the obligation of maintaining the secrecy of Radio communications, and therefore the present licence is granted owing to which he may undertake Wireless Service in Greek merchant vessels as well as at land stations.

The present license is valid for a term of three years beginning to-day and as long as the London Convention of 1912 is in force.

The present license is temporarily or definitely revocable for any obstruction, according to Article 4 of Law 1831, of which he has knowledge.

Athens the.....19..

The Director of the Naval Radiotelegraph Service.

CRETE

DURING the war a wireless apparatus existed in this island for the use of the British Naval and Royal Air Force base at Suda Bay, but this has since been dismantled.

Before the war a site was selected near Mournees in the vicinity of Canea, and the construction of a wireless station was begun under the superintendence of Greek officials sent for the purpose from Athens, but the work was suspended on the outbreak of hostilities. Some time ago eight or nine engineers connected with the Marconi Company, and employed on work at Athens and Smyrna went over and inspected the partial construction. They returned to make their report and it is expected that the station will be completed in the near future.

GUADELOUPE AND DEPENDENCIES

(See also Map Section)

GAUDELOUPE, a French dependency, is situated in the Lesser Antilles, and consists of two islands separated by a narrow channel called "Rivière Salée," and is administered by a Governor. It has an area of 688 square miles and a population of 229,822.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Gaudeloupe.

GUAM

(See also Map Section)

THE Island of Guam, situated at the southern extremity of the Mariana Archipelago, in latitude $13^{\circ} 26'$ N. and longitude $144^{\circ} 43'$ E. was ceded by Spain to the United States, on December 10th, 1898. It has an area of 225 square miles and a population of 14,246.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Guam. Reference can, however, be made under U.S.A.

GUATEMALA

(See also Map Section)

THE Republic of Guatemala lies south-eastward of Mexico, and is almost shut off from the Atlantic Ocean by British Honduras on the north and by the Republic of Honduras on the south-east. The Republic in its present form was established on March 21st, 1847, after having formed part, for 26 years, of the Confederation of Central America. The Constitution dates from December, 1879. It has an area of about 48,290 square miles, and a population of 2,003,579.

CONTROL AND ORGANISATION.

At the present moment radiotelegraphy is represented by a private Government station at Guatemala City. This installation is nominally under the supervision of the Director of Telegraphs. An American operator, Mr. M. W. Haub, is in charge of the Wireless Section.

ADMINISTRATION.

No printed or approved laws and regulations have up to the present been issued in Guatemala to regulate the use of wireless.

No licenses for operators, no press time or weather reports are issued, and there are no aviation or direction finding stations.

HAITI

(See also Map Section)

THE Republic of Haiti occupies the western (French-speaking) portion of the Island of San Domingo, which ranks only second in size to Cuba amongst the West Indian Islands. Its area is estimated at 10,204 square miles, with a population of $2\frac{1}{2}$ millions.

CONTROL.

The Republic does not itself possess any wireless stations, and has passed no regulations affecting telegraphy. The various stations which do exist in the island all constitute items in the American occupation, and remain under the supervision of U.S.A. officials.

HAWAIIAN ISLANDS (SANDWICH ISLANDS)

(See also Map Section)

LYING in the North Pacific Ocean, between $18^{\circ} 54'$ and $20^{\circ} 14'$ north latitude, and $154^{\circ} 48'$ and $160^{\circ} 13'$ west longitude, the Hawaiian Islands are about 2,020 miles south-west of San Francisco. They belong to the United States of America, and have an area of 6,449 square miles, with a population of 191,909.

CONTROL AND ORGANISATION.

The regulation of wireless telegraphy rests in the hands of the Department of Commerce for private stations, and in the hands of the United States Navy Department for the naval section.

ADMINISTRATION.

The laws and regulations affecting the naval radio stations in the Hawaiian Islands are as follows:—

The International Radio Convention;
The National Radio Laws of the United States; and the
Navy Regulations and Communication Instructions.

(See under U.S.A.)

HERMIT ISLANDS

(See under NEW GUINEA).

HOLLAND (Netherlands)

(See also Map Section)

THE Netherlands is the official name of the Kingdom of Holland, and possesses the same signification as its old English title of the "Low Countries." The eleven provinces into which Holland is divided lie between $50^{\circ} 46'$ and $53^{\circ} 34'$ N. latitude, extending from $3^{\circ} 22'$ to $7^{\circ} 14'$ E. longitude. They cover a total area of 12,582 square miles, with a population of 6,841,155. Holland is a constitutional monarchy, the executive being vested in the King or Queen (acting through the Ministers), and the power to make laws in the King or Queen with Parliament ("Staten Generaal"). The Parliament consists of two chambers, of which the second is directly elected by the people and the first by the "Provinciale Staten."

CONTROL.

Except in so far as the Navy, the Army, and the Colonies are concerned, wireless telegraphy is placed in the hands of the Director-General of Posts and Telegraphs under the supervision of the Minister of Waterways.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Minister A. A. H. W. König	Minister of Waterways ..	Zyne Excellentie den Minister van Waterstaat te 's Gravenhage
Mr. E. P. Westerveld ..	Director-General of Posts and Telegraphs	Den Heer Directeur Generaal der Posten en Telegrafie te 's Gravenhage
Mr. A. E. R. Collette ..	Chief Engineer, Director of Telegraphs	Den Heer Hoofdingenieur Directeur der Telegrafie te 's Gravenhage
Mr. J. A. Blandvan den Berg	Inspector of Coast and Ship Radiotelegraph Service	Den Heer Inspecteur bij den dienst der Kust-en Scheepsradiotelegrafie te 's Gravenhage

ORGANISATION.

Radiotelegraphy has from its initiation attracted much interest in Holland. As early as 1899 a commission (Messrs. B. J. R. Engelbregt, C. J. de Vriese, J. C. Ramaer, and Dr. L. Bleekrode) was appointed to report on the subject of the possibility of wireless communication between the lightship *Maas* and the Hook of Holland (16 km.). In the beginning of 1902 this communication was well established. In the same year wireless traffic was established between the railway stations Enkhuizen and Stavoren on behalf of the ferry steamer between the two places.

In February, 1904, a Marconi station was opened at Amsterdam for the transmission to Broomfield, in Essex, of press messages and stock quotations. The messages were published in the newspaper *Het Handelsblad*. The correspondence was of private nature, and ceased after some time.

In September, 1904, the Government station, Scheveningen Port (North Sea coast, near The Hague), was opened for general public correspondence with ships at sea. Scheveningen was the first Government coast station of that nature in Europe.

Dutch radiotelegraphy has extended in all directions. On August 9th, 1920, the foundation stone of a station at Kootwyk, near Apeldoorn, was laid. This station is destined for direct communication with the Dutch East Indies. The receiving station situated at Sambeek, near Boxmeer, was completed earlier, and test service messages are received there regularly. The distance of 60 km. between these two stations makes them suitable for duplex-working.

In the course of 1920 a meteorological service was established on behalf of aviation between the military radio station at Soesterberg and the station of the Air Ministry at London. Several other services are now in operation.

In 1920, a regular radio service open for public correspondence was established between the Netherlands and Germany, and in 1921 between the former country and Great Britain.

LAND STATIONS (NETHERLANDS).

January 1st, 1922.

Official correspondence; Naval stations, (Aerodromes and Army stations not included)	5
Government station open for public service with ships	1
Government stations open for public service (Land traffic)	2

Moreover there are a large number of amateur stations only suitable for reception.

SHIP STATIONS (NETHERLANDS).

January 1st, 1922.

Stations worked by private enterprise open for public service	424
Navy stations (submarines, torpedo boats, etc., not included)	26
Special stations on board lightships	3

LAND STATIONS (DUTCH EAST INDIES).

(According to the latest available statistics.)

Stations for public correspondence with ships	6
Stations for restricted public correspondence with ships	2
Stations under construction	1

LAND STATIONS (CURAÇAO).

Public correspondence with ships	7
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A permit has been granted for the working of some stations on board river boats of the police at Rotterdam. Other private stations have been allowed for scientific and similar purposes. Temporary permits have also been granted to the Stock-Jobbing Union at Amsterdam for radiotelephonic publications of rates during time of Exchange and to the press office Van Dias at Amsterdam, for the broadcasting of radiotelephonic press messages in Holland. For stations only suitable for a reception permit is not necessary.

Stations on ships at sea may not be established or worked by private enterprise without a license issued by the Queen. The general conditions which are imposed are laid down in the form given below.

ADMINISTRATION.

The regulation of radiotelegraphy was first instituted by including a clause relating to wireless in the Telegraph and Telephone Act of 1904. This Act has been supplemented and amended, as far as radiotelegraphy and telephony are concerned.

In 1919 Parliament passed the Bill (presented by the Minister of Agriculture, Industries and Commerce in 1916) to give effect to the International Convention for the Safety of Life at Sea. This Act (Shipping Convention Act of April 5th, 1919) is in agreement with the Articles of the Convention, but has not yet come into force.

The Netherlands possesses important colonies in the East Indies, as well as in South America, and the wireless laws and regulations current in those colonies are appended in the following pages.

The text (so far as radiotelegraphy is concerned) of the following enactments given below:—

- A—Telegraph and Telephone Act, 1904 (supplemented and amended by the Act of March 21st, 1919).
- B—Royal Decree of the 10th May, 1906.
- C—Regulation for Colony of Curaçao.
- D—Regulation for Dutch East Indies.
- E—Form of License for Ship Stations.
- F—Prescriptions issued by the Minister of Waterways regarding the working of foreign vessels within territorial waters or on waters within the territory of the kingdom.
- G—Form of License for Experimental Stations.
- H—Royal Decree of March 6th, 1905.
- I—Royal Decree of July 9th, 1921, relating to receiving arrangements of Radiotelegraphy and Radiotelephony.
- K—Royal Decree of November 22nd, 1921, relating to messages marked "by wire."
- L—Article of Penal Code relating to Violation of Secrecy.

TELEGRAPH AND TELEPHONE ACT OF 1904.

A The Telegraph and Telephone Act of 1904 mainly refers to the ordinary wired services, and it has not been judged worth while, therefore, to reprint it in full here.

According to Article II of this Act, a license granted by the Queen is necessary before telegraphs and telephones can be established or worked by private enterprise. The Act also contains the terms under which the license is issued and the conditions binding on the licensee.

The above provision is also applicable to wireless telegraphy.

Article III prescribes that for the establishment and the use of radiotelegraph and

telephone stations not destined for general public service an authorisation from the Minister of Waterways is required.*

ART. IIIA.—It is forbidden to work radiotelegraphs and telephones, be they destined for public service or not, on board vessels other than of Dutch nationality when within territorial waters, or in waters within the territory of the kingdom, unless it be done in accordance with the prescriptions fixed by the Minister of Waterways (see "F").

* **NOTE.**—Stations only suitable for the reception of radiotelegraphic signals are not considered as radiotelegraph and telephone stations.

For the radiotelegraphs and telephones referred to in the first part of this Article neither license nor authorisation is required, unless they are within the territorial waters of the kingdom and without the license required in virtue of the International Telegraph Convention (with Regulations) of London such as it is at present constituted (*Staatsblad* 1913, No. 132) or may be constituted, also as it may be modified for the Netherlands.

B Decree of May 10th, 1906, relating to the fixing of provisional tariff for telegraphic communications for reports and distress signals received by radio-telegraphic means from ships at sea.

ART. 1.—The Government Office with radio-telegraphic service at Scheveningen Harbour shall report by telegraph, to those who have notified themselves for the purpose, the communications from ships and distress signals received by way of radiotelegraphy.

ART. 2.—The reports referred to in Article 1 shall be supplied within the Netherlands subject to the payment by the addressee of a coast charge of 1 florin for the present for each communication, increased by an amount of 50 cents if the telegram to be drawn up does not contain more than 10 words, and of 25 cents above this for each successive 10 words or fraction thereof.

Nevertheless, the reports herein mentioned may also be supplied against such a fixed price per year as shall be fixed by our Minister of Waterways, Commerce and Industry for each interested party, taking into consideration both the number and the extent of the required information and also the above-named tariff.

In supplying the reports referred to in this Article to interested parties outside the Netherlands, the above-mentioned costs will be increased by the foreign telegraphic tariff applying thereto.

ART. 3.—This Decree shall come into operation on the second day after the date of the *Staatsblad* and the *Staatscourant* in which it is published.

Our Minister of Waterways, Commerce and Industry is entrusted with the execution of this Decree, which shall be published simultaneously in the *Staatsblad* and in the *Staatscourant*, and a copy whereof shall be sent to the State Council.

REGULATIONS FOR TELEGRAPHIC SERVICE IN THE DUTCH COLONY OF CURACAO.

Publication No. 52 of 1909. (21st September.)

C The Governor of Curaçao, in view of the desirability of replacing by new regulations the decree of the 30th October, 1873, regulating the inland and foreign telegraph communication of the colony as well as that of the 27th September, 1884, regulating telephonic communication, and having received the sanction of the Colonial Council, has determined on the following decree:—

ART. 1.—In this decree it is understood that telegraphs and telephones refer to the usual line-telegraphs and telephones as well as to radiotelegraphs and telephones.

ART. 2.—No telegraphs and telephones may be installed on any of the islands of the colony by others than the Government, unless a special permit is granted. Besides the special conditions, made in each case, the general rules are:—

(a) The erection, maintenance and exploitation should be carried out to the satisfaction of the Governor.

(b) The tariffs, conditions of use and service regulations must be submitted for the approval of the Governor.

(c) The concession may be granted absolutely or conditionally, but for no longer period than 25 years.

(d) The concession may be withdrawn by the Governor if the above rules or the special conditions are not followed.

ART. 3.—It is forbidden, without the permission of the Governor, to use radiotelegraphs or telephones, fitted on board foreign or private-owned Dutch ships, in the ports or anchorages of the colony, unless in special circumstances, the exigencies of good seamanship render it necessary to do so.

ART. 4.—Everybody may make use of telegraphs and telephones under the existing regulations. The transmission of telegrams or the conversation by telephone may be stopped or refused if in conflict with the safety of the colony, public order, or common decency.

The reasons for refusal or stoppage should be communicated to the party concerned.

The decision of the Governor may be invoked in such cases.

ART. 5.—For the public interest the Governor may put telegraph and telephone service under control or partially suspend it for an indefinite period.

ART. 6.—In case of war, or if any of the islands of the colony be placed under martial law, if so desired the telegraphs and telephones may be put under Government control.

ART. 7.—Imprisonment of one day to six months and fines from 10 florins to 1,000 florins conjointly or separately will be inflicted on those who erect or exploit telegraphs and telephones, without the permission required as specified in Art. 2; or who on board private-owned ships, make unlawful use of the same (Art. 3).

The instruments may, in so far as they are owned by the guilty parties, be confiscated.

ART. 8.—Anyone who wilfully damages or destroys telegraph and telephone works, including cables, in use for public benefit, will be punished with imprisonment from three months to three years.

Anyone who causes such damage as is referred to above, through neglect, may be punished with imprisonment of one day to one month or a fine of 1 florin to 100 florins.

ART. 9.—Deals with the punishment of crimes committed in which telephones are used.

ART. 10.—Libellous, offensive and indecent expressions used over the telephone, will be considered as uttered in public.

ART. 11.—Violation of the secrecy of telegraphs and telephones is punishable in accordance with Arts. 137 and 327 of the existing law.

ART. 12.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ARTS. 13, 14, 15 and 16 deal with the use of private property in the erection of telegraph and telephone lines.

ART. 17.—All precautions should be taken to prevent lightning being conducted along cables or lines.

ART. 18.—The above may be referred to as "Telegraaf- en Telefoon-Verordening 1909," adding the number of the publication.

ART. 19.—Decrees of 30th October, 1873 (P.B. 1874, No. 1) and of 27th September, 1884 (P.B. 1884, No. 14) as well as P.B. 1892, No. 27, are withdrawn.

ART. 20.—Concessions relating to the erection of telegraphs and telephones on any of the islands of the Colony of Curaçao, granted before this decree comes into force, will be treated as coming under the regulations in force when they were made.

REGULATIONS FOR TELEGRAPH SERVICE IN THE DUTCH EAST INDIES.

6th October, 1876.

D The old regulations issued by decree of 31st March, 1858, concerning the electro-magnetic telegraphs should now be superseded and new regulations as hereunder be brought into force.

Regulations concerning the erection and use of telegraphs in the Dutch East Indies.

ART. 1.—No telegraphs may be erected or used without permission of the Government, except those exclusively owned and used privately.

ART. 2.—The conditions for permission to erect such telegraphs will be fixed in each case separately.

ART. 3.—The Governor-General has the right to take possession of all telegraphs or to stop their exploitation.

ART. 4.—If telegraphs are erected without permission open for public traffic, a fine of from 200 florins to 1,000 florins can be inflicted.

ART. 5.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ART. 6.—They should give access to officials and not interfere with the work done and the lines erected.

ART. 7.—If they refuse access they will be fined from 25 florins to 100 florins.

ART. 8.—They have a right to compensation or damage done to their property.

ART. 9.—Everybody has a right to have telegrams sent under the conditions laid down in the service regulations.

ART. 10.—The State or the Telegraph Company is not responsible for the transmission of telegrams in general or within a certain time.

ART. 11.—Punishment for embezzlement or opening of telegrams, communication of their contents to outsiders, etc., will be inflicted in accordance with the existing laws.

ART. 11A.—Telegrams, the contents of which are of danger to the State, or in conflict with the law, or of an obscene character, will not be accepted or delivered.

ART. 12.—Punishment in accordance with the existing laws is to be inflicted on every official who falsifies telegrams and on those who knowingly profit by the misuse of such telegrams.

ART. 13.—Damage to telegraph works or material is punishable with imprisonment and penal servitude.

ART. 14.—The Head of the Local Council may order, on request of the Chief of the Telegraph Service, the removal of everything impeding the efficiency of that service.

The above was published in the *Official Gazette (Staatsblad)* of the Dutch East Indies, and the regulations also apply to Telegraphs or Telephones, whereby the apparatus at both ends is not connected with wires or conductors (Decree of 7th December, 1903. *Staatsblad*, No. 405, supplemented by Decree of 8th September, 1905. *Staatsblad*, No. 403).

LICENSE FOR SHIP STATIONS.

E ART. 1.—In this license is meant—
By Convention: the Radiotelegraphic Convention with final protocol, signed in London on July 5th, 1912, and all alterations and additions, that may be made thereto.

By Regulations: the Regulations belonging to this Convention with all alterations and additions that may be made thereto.

ART. 2.—The license is given for an indefinite period, and may be withdrawn at any time, after one year's notice.

The license, or an authentic copy of it, should always be kept on the ship. It must be shown on request abroad if asked for by the persons authorised herein.

ART. 3.—*System.*—The licensee is obliged to choose a system capable of communication with the Government stations opened for public radiograms, and to make the installation comply with the International Laws and Regulations. The antenna input should be such as to enable a decrease down to 10 per cent. of the maximum input. If an emergency set is required, as set forth in Art. XI of the International Regulations, the source of power, and eventually the other parts of the installation, must be fitted on or above the upper deck, and, furthermore, are subject to the rules to be made therefor by the Director-General of Posts and Telegraphs. In case the position of the wireless cabin does not give the telegraphist direct communication with the bridge, without leaving the operating room, direct communication must be established as may be required by the Director-General of Posts and Telegraphs.

ART. 4.

Hours of Service.

A. *First Class.*—On ship stations belonging to the first class, as stipulated in Art. 13, s. 3, of the Regulations, a continuous service is maintained. Except in cases of *force majeure* these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

B. *Second Class.*—On ship stations belonging to the second class, as stipulated in Art. 13, sec. 3, of the Regulations, the service is maintained during the hours indicated in the official list of radiotelegraphic stations. The hours of service are fixed in consultation with the Director-General of Posts and Telegraphs. Except in cases of *force majeure*, these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

C. *Third Class.*—Here the article only stipulates that the ship station belongs to the third class as indicated in Art. 13, sec. 3, of the Regulations.

ART. 5.

Information.

As for the station on shipboard the licensee is obliged to provide the Director-General of Posts and Telegraphs with all facilities and information necessary for the fulfilment of all legal requirements.

ART. 6.

Approval of the Ship's Station and of the Personnel.

The ship's station will not be put in operation until the Director-General of Posts and Telegraphs has approved the installation of the ship's station, together with the constitution of capacity of the service staff.

A written certificate of the approval of the installation provided by the Director-General before mentioned must be hung in a position where it can be seen, whether near to or inside

the ship's station. Such approval is also required in respect of any alterations which it may be necessary to make.

A sum of 25 florins is charged for the provision of the first certificate of approval.

Officers to be appointed by the Director-General aforesaid shall have the right of access at all times to the station for the purpose of making an inspection and ascertaining whether it still satisfies the stipulated requirements.

A note will be made on the certificate referred to of the time at which the inspection shall have taken place.

In proof that the capacity of the service staff satisfies the stipulated requirements, a certificate is granted by the said Director-General in which are set forth the class and the name, and this certificate likewise contains the assurance that the person in whose name it is drawn up, has given an undertaking to the said Director-General that he will observe secrecy in regard to all the telegrams which may come to his knowledge through the medium of the ship's station.

The certificate may be cancelled if the said Director-General is of the opinion that the person in whose name it has been made out is no longer complying with the stipulated requirements and is, in fact, acting contrary to the terms of the concession.

Information must be given immediately to the said Director-General of any alteration which may have been made in the plant of the ship's station, which affects any term of the convention or of the regulations or of any change which may have been made in the service staff.

ART. 7.

Authorisation to work Station.

The licensee is authorised to exchange telegrams with stations opened to public correspondence, as well as with stations not destined for public wireless traffic, as far as this does not interfere with public correspondence; both authorisations hold good, subject to their not infringing any private rules which might be in force at any of these stations. All communication by a ship station must cease immediately upon the request of a Dutch coast station open to public correspondence.

ART. 8.

Wavelength.

In addition to the wavelength of 600 and 300 metres provided for in Art. 3 of these Regulations, other wavelengths less than 600 metres are used in some cases according to the provisions made by the Director-General of Posts and Telegraphs.

ART. 9.

Places where Transmission is Prohibited.

Apart from the conditions of the Regulations appertaining thereto, it is hereby forbidden without the consent of the Director-General of Posts and Telegraphs, given with due regard to the relevant conditions, to use the ship stations within Dutch territorial waters or any Dutch waters inside those limits, unless under special conditions the requirements of good seamanship make contravention of this rule a necessity.

ART. 10.

Cessation of Traffic.

The working of a ship station is suspended either completely or partly as soon as it is judged necessary to the general interest. Upon the order of the Director-General of Posts and Telegraphs, the service may be suspended at certain places or daily during certain hours.

ART. 11.

Approval according to Art. 2 of the Telegraph and Telephone Act.

The remaining conditions concerning the use, Service Regulations, and the rate of wages and hours of duty of the operators, are submitted for the approval of the Minister of Waterstaat.

ART. 12.

Exchange of Telegrams.

The conditions of the Dutch Telegraph and International Regulations, and further, the conditions concerning the public Dutch radiotelegraph service, as well as all modifications and supplements thereto, refer to the exchange of telegrams.

ART. 13.

Ship Tax.

The ship tax amounts to

ART. 14.

Accountancy.

The settlement of taxes takes place according to the rules to be fixed by the Director-General of Posts and Telegraphs.

ART. 15.

Secrecy of Correspondence.

The licensee is obliged to observe secrecy in regard to all telegrams which might come to his knowledge by means of the ship station. He must make sure that no person other than the operator in charge of the station has any opportunity of learning the contents of said telegrams.

ART. 16.

Forwarding of Documents.

The forwarding of documents concerning the radiotelegraphic service must take place under the rules of the Director-General of Posts and Telegraphs made according to the restrictions mentioned in Art. XI of the Regulations.

ART. 17.

Obligation to erect, maintain and work to the satisfaction of the Ministry of Marine.

In conformity with the declaration contained in Art. 26 of these stipulations, the concessionary binds himself to work the ship's station within a period of time to be fixed by the Director-General of Posts and Telegraphs on the occasion of his signifying his approval in terms of Art. 6. The erection, the maintenance, and working of the station must be carried out to the satisfaction of our Minister of Marine.

ART. 18.

Control.

Officers appointed by the Director-General of Posts and Telegraphs are authorised to control the working of the station and its operators, and to supervise the station service generally. If required they may also take temporary control of the station, upon showing a written and signed authorisation.

ART. 19.

Distress Signals.

For sending or receiving distress signals it is allowed to depart from the conditions of this concession, provided this deviation is necessary for the benefit of the ship in distress. For the distress signal (which may also be given in cases of other accidents than those which may occur to the ship concerned) no other signal may be used except the signal $\bullet \bullet \bullet - - - \bullet \bullet \bullet$, unless approved by the Director-General of Posts and Telegraphs.

ART. 20.

Meteorological Telegram, Time Signals, and other Signals.

The licensee is obliged to adhere to the rules which are made by or on behalf of the Minister of Waterstaat with reference to meteorological telegrams, time signals, and other signals.

ART. 21.

Authorisation and Obligations Outside the Territorial Waters of the (Dutch) Kingdom.

Outside the territorial waters of the Kingdom the rules of this license are valid in so far as they are not contradictory to the Laws and Regulations which hold good in the locality in question.

ART. 22.

Other Rules and Regulations.

Moreover, the licensee is subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy which are prescribed or will be prescribed by Dutch law; by the Convention and the Regulations; or by any other International agreement to which Holland accedes or will accede; as well as to any modifications which may be deemed necessary for the execution of such Regulations.

ART. 23.

Annulment of the Concession.

The concession may be revoked by us:

1. If the ship's station has not been erected within one year from the granting of the concession.

2. By non-observance of the prescriptions of the telegraph and telephone code, 1904 (State Paper No. 7), of the terms in accordance with which this concession is granted, or of any stipulation of the national or international legal prescriptions described in this document.

3. If the ship ceases to be a Dutch ship in the sense understood in this concession.

ART. 24.

Further Obligations of the Licensee.

A. *First Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this license is introduced, also when the ship on which the station has been fitted is out of commission or changes owners.

B. *Second Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this license is introduced; also when the ship on which the station has been fitted is out of commission or changes owners.

C. *Third Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs if the ship on which the station has been fitted is out of commission or changes owners.

ART. 25.

Violation of Rules.

In addition to the withdrawal of license mentioned in Art. 23, except in cases of *force majeure*, the licensee is fined from F. 10 to F. 1,000, at the discretion of the Minister of Waterstaat, for each violation of any rule laid down in this license, of the said national or international legal prescriptions, as mentioned herein, and is fined from Fl. 1 to Fl. 100 for each day, after the period fixed for paying the fines, that he fails to adhere to the rules of this agreement.

Dating from the day on which the decision to withdraw the license in consequence of Art. 23 has been taken, fines are no longer due. This article may be applied immediately. The said Minister decides the legal grounds for administering a fine; or the legality of a claim on grounds of *force majeure*.

In addition to the fine, the said Minister will decide to what cause the violation is due, to enable him to take action according to the contents of Art. 16 of the Regulations.

ART. 26.

Acceptance.

A declaration of agreement must be forwarded to the Director-General of Posts and Telegraphs, within the period fixed by him, intimating an acceptance of the terms of this license.

PRESCRIPTION ISSUED BY THE
MINISTER OF WATERWAYS.

Regulations which are prescribed by the Minister of Waterways and which in as far as they do not differ from any international agreement, to which the Netherlands are, or will be bound, are valid for foreign radiotelegraphic or telephonic ship stations which are within territorial waters or in waters within the territory of the Kingdom.

ART. 1.—I. It is forbidden to use radio-telegraphs or telephones be they destined for public service or not, installed on board of foreign ships within Dutch territorial waters or waters within the territory of the Kingdom, unless the prescriptions of this disposition are observed.

2. Moreover shall, as far as waters within the territorial limits of the Kingdom are concerned, those stations only may be worked by consent of the Director-General of Posts and Telegraphs when due regard is given to the conditions prescribed in said permit.

3. Contravention of the rules as set forth in parts 1 and 2 of this article is allowed under special conditions, the requirements of good seamanship should make this necessary.

ART. 2.—I. Foreign ship stations may exchange telegrams or have a conversation with radiotelegraph or telephone stations destined for public service under reserve of the special rules, which might be valid for any one of these stations.

2. The exchange of traffic with stations not destined for public service is permitted under reserve of the special rules which might be valid for any one of these stations, and in so far as in the opinion of one or more public stations, the general public radio telegraphic or telephonic service is not interfered with.

3. All traffic of foreign ship stations is immediately to be suspended, as soon as such is requested by any Dutch coast station open for general public service.

ART. 3.—I. It is forbidden that by means of foreign ship stations hindrance should be given to the exploitation or the use of Government radiotelegraphs and telephones be they destined for public service or not, or to the exploitation of other radiotelegraphs and telephones destined for public service.

2. Foreign ships must cease working of their stations as soon as they observe or when they are informed, that their working gives rise to an interference as described in part 1 of this article.

ART. 4.—The Minister of Waterways may suspend the working of foreign ship stations either completely or partly as soon as it is judged necessary.

2. The Director-General of Posts and Telegraphs has equal competency as far as it concerns suspension at certain places or daily during certain hours.

The licensees of foreign ship stations are subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy or telephony which are prescribed by the International Radio Telegraph Convention with final protocol and Regulations of London such as it is at present (Staatsblad 1913 No. 132), or, later on, also for Holland, might be modified, either are or shall be prescribed by any other International agreement to which Holland accedes or will accede.

LICENSE FOR EXPERIMENTAL STATION.

A license has been granted to **G** for use of wireless telegraphs and telephones, which are installed in the premises situate at _____ in _____ under the following conditions and in virtue of his undertaking to pay the costs, make good the loss and pay the interest which may be found to arise therefrom.

ART. 1.—The article is granted until further notice.

ART. 2.—The use of the wireless telegraphs and telephones is limited to the carrying out of experiments.

ART. 3.—If the wireless telegraphs and telephones are used in such a way that energy is radiated outwards beyond the precincts of the premises, this may only be done by means of transmitter for unrestricted waves of metres. The holder of the license is under obligation, in the case of such use being made of the installation, to employ a receiver in the premises where the experiments are being conducted during the whole period of the carrying out of the experiments, which is capable of receiving restricted waves of a length of 600 metres; so that any demand made by any station, in accordance with Art. 4, may be complied with.

The call letters to be used are _____ and these must be repeated _____ times at the commencement and on the conclusion of the experiments.

Furthermore, the holder of the license is under obligation to have in his said premises a telephonic connection with the local telephone service.

ART. 4.—All the radiation of electrical energy is immediately stopped whenever, with an eye to the interests of the national wireless telegraph and telephone service, this may be thought necessary by the national stations concerned, and by the term "service" is to be understood the service of all the national stations, including those belonging to departments other than the department of the Minister of Marine.

ART. 5.—The experiments may be conducted on _____ from _____ to _____

ART. 6.—The holder of the license shall pay to the Government a fee of 100 florins per week—hour per annum.

ART. 7.—The use of the wireless telegraphs and telephones may be suspended wholly or in part whenever this is thought to be necessary in the general interest by the Minister of Marine.

The work may be interrupted temporarily on the authority of the Director General of Posts and Telegraphs during parts of the hours in which the experiments are being conducted.

ART. 8.—All licensees are under obligation to carry out the provisions which may be required by or on behalf of the Minister of Marine within the period stipulated by the latter.

ART. 9.—The officers who are to be appointed by the said Director-General of Posts and Telegraphs are charged with the superintendence of the wireless telegraphs and telephones.

In this connection access to the wireless telegraphs and telephones must be permitted at all times to the officers referred to.

ART. 10.—No use may be made of the license before it has been accepted by means of a declaration to be handed in before the

ART. 11.—The holder of the license is liable at the discretion of the Minister of Marine to a penalty of Fl. 100 to Fl. 1,000 for each violation of any stipulation of this license, and to a further penalty of Fl. 1 to Fl. 100, likewise in the discretion of the said Minister of Marine, for every day after the lapse of the period named on the imposition of the major penalty in which he continues in default or in the act of violation of the stipulation referred to.

No single act of default is necessary for the application of the stipulation contained in this article.

The said Minister decides upon the existence of the grounds for the imposition of the penalty and the amount of the penalty, as well as the justification there may be for an appeal for reasons of *force majeure*.

ART. 12.—In spite of restrictions indicated in the foregoing, the prescriptions for installations which are exclusively suitable for the reception of wireless telegraph and/or wireless telephone signals, as laid down by the Minister of Marine (instruction of the 8th August, 1921, No. 1, Department of Posts and Telegraphs) in virtue of the stipulations contained in Art. 2 *bis* of the Royal Decree of the 6th March, 1905 (page 90), recently modified by Royal Decree of the 9th July, 1921 (page 903), remain in application.

H Royal Decree of the 6th March, 1904 (State Paper No. 90), for the institution of a general measure of Government, as contemplated in Art. 12 of the Telegraph and Telephone Code, 1904 (State Paper No. 7), in so far as this Decree reads after the modifications introduced into it by the Royal Decrees of the 11th July, 1914 (State Paper No. 302) of the 15th November, 1919 (State Paper No. 753), and of the 9th July, 1921 (State Paper No. 903).

ART. 1.—Unless provided with a license from our Minister of Marine and with due regard to the terms and stipulations set forth therein for the prevention of the interruption of the working of telegraphs and telephones intended for the service of the public, it is forbidden to erect or to use:—

1. (a) Any overhead electrical conductor for purposes of lighting or the transmission of motive power situated within less than 6 metres in horizontal distance from any overhead conductor belonging to the Telegraphs and Telephones intended for the service of the public;

(b) Any other overhead electrical conductor situated within less than 2 metres in horizontal distance from any overhead conductor belonging to Telegraphs and Telephone intended for the service of the public;

2. Any underground electrical conductor situated at less than 0.50 metres distance from any underground conductor belonging to Telegraphs and Telephones intended for

the service of the public; electrical conductors inside buildings are not comprised among the conductors mentioned in 1 and 2.

The license referred to under paragraphs 1 and 2 is not required for electrical conductors and installations which were already in use when the general measure of Government came into force.

ART. 2.—It is forbidden to put any obstacles in the way of the working of telegraphs and telephones intended for the service of the public by means of any electrical conductor or installation.

ART. 2A.—Notwithstanding the stipulation contained in the preceding article, the possession and use of plant, which is merely suitable for the reception of wireless telegraphic and telephonic signals, are only permitted with due observance of the prescriptions which are laid down by our Minister of Marine.

ART. 3.—The costs incurred in the carrying out of arrangements for the purpose of removing obstacles which have been placed in the way of the effective working of telegraphs and telephones intended for the use of the public by an electrical conductor or plant already in existence at the time of the installation of such telegraphs and telephones shall be borne by those who undertake the installation of the said telegraphs and telephones to such an extent as these costs may be approved by our Minister of Marine.

ART. 3A.—The preceding articles of the Decree are equally applicable to telegraphs and telephones which are installed by the State but which are not intended for the service of the public.

ART. 4.—The carrying out of the prescriptions of this general measure of Government is entrusted to the officers and officials of the State and the municipalities, the inspector in the coastal and ship wireless telegraph service, the chief engineers and engineers, the electro-technical chief officers and officers of the telegraphic service. The official reports drawn up by them are transmitted to the competent officer of the Public Ministry at the District Court, a copy of such reports being also sent to the Director-General of Posts and Telegraphs.

ART. 5.—Violation of the prescriptions set forth in Articles 1, 2 and 2 bis of this general Government measure is punished, and this in so far as it may otherwise be provided for by the law, by imprisonment for a period not exceeding 30 days or by a fine not exceeding 300 florins.

622.—RECEIVING ARRANGEMENTS FOR RADIOTELEGRAPHY AND RADIOTELEPHONY.

I By Royal Decree of July 9th, 1921 (Staatsblad No. 908), of which the text is given below, the Minister van Waterstaat is given authority to make regulations with which apparatus exclusively intended for receiving wireless telegraphic and telephonic signals shall comply, and furthermore penalties are decreed for non-observance of the rules.

Text of the Royal Decree of July 9th, 1921 (Staatsblad No. 903), containing supplement to and alteration of the Royal Decree of March 6th, 1905 (Staatsblad No. 90), finally revised in the Royal Decree of November 15th, 1919 (Staatsblad No. 753).

ART. 1.—After Article 2 of Our Decree of March 6th, 1905 (Staatsblad No. 90) is inserted an Article 2 bis as follows:—

Without prejudice to the enactments of the preceding Article the possession and the use of apparatus which are exclusively

fitted for the receipt of radiotelegraphic and radiotelephonic signals are only granted subject to observance of the regulations which shall be made by Our Minister van Waterstaat.

ART. 2.—Article 4, first paragraph, as previously resolved by us is to be read as follows:—

The officials of the Royal and Municipal Police, and the Inspectorate of the coastal and ships' wireless telegraphy, the chief engineers and engineers, electrotechnical head officials and officials of the Telegraph Service are charged with the maintenance of these general rules prescribed by the Government.

ART. 3.—In Article 5 of the Decree as given by Us the words "the Articles 1 and 2" are replaced by the words "the Articles 1, 2 and 2 bis."

ART. 4.—This Decree comes into force on the second day from the date of the Staatsblad in which it appears.

The Decree came into force on August 7th, 1921.

The regulations of Art. 1 heretofore mentioned are:—

Text of the Ordinance of the Minister van Waterstaat of August 8th, 1921, No. 1, Department of Posts and Telegraphs.

ART. 1.—In this Ordinance is understood:—
By "Minister," the Minister van Waterstaat.

By "Director-General," the Director-General of Posts and Telegraphs.

By "signals," radiotelegraphic or radiotelephonic signals of any kind.

By "receiving apparatus," apparatus maintained by or used by others than the State which are exclusively designed for receiving radiotelegraphic and/or radiotelephonic signals.

ART. 2.—It is forbidden to take note in any way of signals received which are intended for another, or to communicate their contents, the substance of them or their existence to a third party or to allow them to be so communicated.

ART. 3.—Users of receiving apparatus must observe all orders which are directed to them with reference to the apparatus by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephone Act, 1904 (Staatsblad No. 7) by the military authorities.

ART. 4.—The receiving apparatus are subject to any control which is deemed necessary by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephones Act, 1904 (Staatsblad No. 7), by the military authorities.

The officials appointed by or on account of the Director-General or the authorities must always be allowed to inspect the apparatus, and note all that has bearing on what is received.

ART. 5.—Users of receiving apparatus must give notice of its presence to the local Director of the Royal Telegraph Office or to a neighbouring Post Office if there is not one in the town. This is to be done by means of a form which can be obtained from all post offices free of cost.

On this form when completed must be shown:—

1. Surname and Christian names of the user of the apparatus, the date and the year of his birth, his town and address, and exact indication of where the apparatus is situated.

2. It must be stated whether lamps or other apparatus are used which can send out waves obstructing wireless traffic.

3. That the user is acquainted with the regulations governing the use of the apparatus, and that he accepts them unconditionally.

When the form is sent in an acknowledgment of receipt is issued by the Director of the Post Office in question. The user must be able to produce this receipt at all times, and in default it will be assumed that no form was completed.

ROYAL DECREE OF NOVEMBER 22ND, 1921,
RELATING TO TRANSMISSION OF MESSAGES
MARKED "By Wire."

*Royal Decree of the 22nd November, 1921 (State
Paper No. 1344).*

K ART. 1.—Unless telegrams are provided with the gratuitous direction "By Wire," the Telegraph Administration are entitled to make use either of the wireless telegraphic service or of the line telegraphic service for their transmission.

A decision will be made by or on behalf of our said Minister and published in the official *Gazette* with respect to which telegrams use

shall be made of the right indicated in the first paragraph.

This right is made use of with respect to telegrams handed in in Holland and destined for the United Kingdom or Germany.

NEW ARTICLE OF PENAL CODE RELATING TO
VIOLATION OF SECRECY OF WIRELESS CORRESPONDENCE.

Penal Code

L ART. 441.—"Any person who communicates to another the contents of a message which has been received by means of a receiver which is under his charge or which is used by him for purposes of wireless telegraphy or telephony, when he has reason to suppose that such message is neither intended for him nor for the information of the public and if he has reason to believe that by so doing the contents of such message may be brought to the notice of the public and if such a publication actually takes place, or who makes public the contents of such message, is punishable by imprisonment for a period not exceeding three months or by a fine not exceeding 1,000 florins."

HONG-KONG

(See also Map Section)

THE Crown Colony of Hong-Kong consists of a number of islands situated off the south-eastern coast of China, at the mouth of the Canton River, and of a portion of the adjacent mainland. They lie between latitude $22^{\circ} 10'$ and $22^{\circ} 34'$ N.; whilst the longitude extends between $113^{\circ} 52'$ and $114^{\circ} 30'$ E. The capital of the Colony is Victoria, built on the northern shore of Hong-Kong Island, facing the mainland. The magnificent harbour consists of the arm of the sea which lies between the mainland and the city. It was first occupied by Great Britain in January, 1841, and is now administered as a Crown Colony under a Governor aided by an Executive Council of nine members and a Legislative Council of thirteen. It has an area of 391 square miles and a population of 625,166.

CONTROL AND ORGANISATION.

Hong-Kong possesses two wireless stations, one of which, at Cape D'Aguiar, is for commercial service. This station is worked by the Hong-Kong Post Office and under the control of the Colonial Postmaster-General.

Weather reports and Typhoon warnings (on receipt from the Royal Observatory) are transmitted by Cape D'Aguiar, and Time Signals by Stonecutters W/T Station.

A Direction Finding Apparatus will be installed in the near future at Cape D'Aguiar.

A new sub-station is under construction at Gap Rock to ensure communication between the Gap Rock Signal Station and Hong-Kong. The installation is $\frac{1}{2}$ kw., Marconi type.

*Note.—(Hong-Kong time is eight hours ahead of G.M.T.)

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. S. B. C. Ross, O.B.E...	Postmaster-General	Hong-Kong
Mr. S. Bradshaw	Superintendent Wireless Telegraphy.. .. .	Hong-Kong

ADMINISTRATION.

The regulation of wireless telegraphy is carried on under the provisions of the Wireless Telegraphy Ordinance, 1913, passed on July 24th of that

year, which repealed all previous Ordinances; and by regulations issued under that Ordinance.

- A—The Wireless Telegraphy Ordinance, 1913.
- B—Regulations.
- C—Ship License.
- D—Permit to use wireless telegraphy on ships in the harbours of the Colony.

ORDINANCE No. 20 OF 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" as (defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony.

(4). (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a license granted in that behalf by the Governor.

(ii) Every such license shall be in such form and for such period as the Governor-in-Council may determine and shall contain such terms, conditions, and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor-in-Council may make regulations for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(b) For prescribing the fees payable on the grant of any license;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Colonial Secretary, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the colony;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(ii) Provided that no regulations made in respect of the matters described in paragraphs (c), (d), and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent of royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided

for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures, and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. The Wireless Telegraphy Ordinance, 1903, the Wireless Telegraphy Ordinance, 1909, and the Wireless Telegraphy Amendment Ordinance, 1909, are hereby repealed.

B The following regulations were made by the Officer Administering the Government in Council under the provisions of Section 6 of the Wireless Telegraphy Ordinance No. 20 of 1913, on November 20th, 1913:—

1. Any person desirous of obtaining a license for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony, or on board any British ship registered in the colony, must apply in writing to the Colonial Secretary. Such application must contain full particulars—

(a) Of the place or ship in respect of which a license is sought;

(b) Of the nature of the apparatus which it is desired and proposed to instal and work; and

(c) Of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licenses:—

(a) For a license under Section 3 for a land station \$2.50

(b) For a license under Section 3 for a ship station \$2.50

(c) For an experimental license under Section 7 Nil

3. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with—

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Colonial Secretary of the colony.

5. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that his Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. No proceedings shall be taken against any person under these Regulations except with the previous sanction of the Attorney-General.

SHIP LICENSE.

Dated the day of , 19

C THE WIRELESS TELEGRAPHY ORDINANCE, 1913. (HONG-KONG.)

His Excellency the Governor of the Colony of Hong-Kong

To
License to establish Wireless Telegraph Ship Stations.

TO ALL TO WHOM THESE PRESENTS SHALL COME I

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same send greeting:

Whereas
of (hereinafter called "the licensee") is desirous of establishing installing working and using on a ship or ships belonging to the licensee Wireless Telegraphy as defined in Section 2 of the Wireless Telegraphy Ordinance, 1913:

And whereas by reason of the provisions of the Wireless Telegraphy Ordinance, 1913, it is unlawful to establish any wireless telegraphy station or install or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a license granted in that behalf by the Governor:

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above-named

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee from the date hereof so long as the Wireless Telegraphy Ordinance, 1913, shall continue in force unless and until these presents and the license or permission hereby given shall be determined as hereinafter provided license and permission—

(i) To establish, install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Provided that—

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, as is specified in the said Schedule opposite to the name of such station;

(b) The apparatus installed at each ship station shall be of the character specified in the said schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus

used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraphic Convention, 1912;

(e) The licensed apparatus shall be, so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Government of the Colony for the time being or as may be otherwise directed by the Governor and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Governor; Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraphic Convention, 1912; Provided further that only the wavelength of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(f) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word.

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with the consent in writing of the Colonial Secretary of the Colony send or receive messages from and at the said ship stations when in any of the harbours of the colony; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the officer of His Majesty's Navy who is for the time being in Hong-Kong in charge of the China Squadron of His Majesty's Eastern Fleet.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated

the 10th/22nd July, 1875, and the Service Regulations made thereunder and include respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraphic Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Admiralty is of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Governor so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor-in-Council in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this license the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise. Provided always that signals of

distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12. (1) The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion and the licensee shall provide for the working of each station such operators as are required by the provisions of Article X of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, according to the class of the ship station and shall observe the regulations as to the working of the ship station laid down according to its class by Article XIII of the said Regulations.

(2) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion in accordance with the Radiotelegraphic Convention, 1912. Such certificates will be valid only during the operation of the said Convention. When issued by the Governor such certificates will be granted to persons of such technical proficiency and will be in such form and will be subject to such conditions as the Governor shall from time to time prescribe and they may be, by whomsoever issued, endorsed or withdrawn at the discretion of the Governor in case of misconduct or breach on the part of the holder of the regulations prescribed for the working of ship stations.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act, 1884, and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license entitling the Governor under clause 22 hereof to revoke and determine this license.

14. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Governor shall from time to time reasonably require to be shown; messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least

fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraphic Convention, 1912, and such registers and message papers shall be open to the inspection of the Governor or his officers thereto authorised at the office of the licensee in Hong-Kong or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a general or public holiday.

15. The licensee shall render to the Governor such accounts as the Governor shall direct in respect of all charges, if any, due or payable under the Radiotelegraphic Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Colonial Treasurer at such times and in such manner as the Governor shall direct all sums which shall be due from the licensee under such accounts.

16. The Governor and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instrument respectively.

17. The licensee shall carry on every ship on which a ship station is established under this license a print or copy of the license certified under the hand of the Colonial Secretary of the colony of Hong-Kong or appropriate officer of the Postmaster-General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraphic Convention, 1912.

18. (1) The licensee shall pay to the Colonial Treasurer for and in respect of the license hereby granted a royalty of \$2.50 per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st of December in each year during which the license remains valid.

19. Except with the consent in writing of the Governor the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses, powers or authorities hereby granted or any of such licenses, powers or authorities.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval, Military, Customs or Police officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow

THE SCHEDULE OF SHIP STATIONS BEFORE REFERRED TO.

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraphic Convention, 1912.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		If Alternator is used, Number of Cycles per Second.
				By Night.	By Day.	System of Radiotelegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken in Sending Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. At any time after the day of 19, the Governor may in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Governor under any condition or provision herein contained.

22. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Colonial Treasurer under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained; then and in any such case the Governor may by notice in writing under his seal revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Governor under any condition or provision herein contained.

23. Nothing in these presents contained shall prejudice or affect the right of the Governor from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the colony by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor or any other person by or under any Imperial or local enactment or by or under any agreement relating to the transmission of messages by ordinary land and submarine telegraphy.

24. Any notice request or consent (whether expressed in writing or not) to be given by the Governor under these presents may be under the hand of the Colonial Secretary of the Colony of Hong-Kong and may be served by

sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Hong Kong.

As witness my hand and seal this
day of _____ one thousand
nine hundred and _____

PERMIT TO WORK AND USE APPARATUS FOR
WIRELESS TELEGRAPHY ON BOARD A
MERCHANT SHIP IN THE HARBOURS OF
THE COLONY.

The Wireless Telegraphy Ordinance, 1913.

Section 6 (1) (iv).

D Permission is hereby given for the working and using of apparatus for Wireless Telegraphy on board the ships of the
specified in the Schedule hereto whilst such ships are in any of the harbours of the Colony subject nevertheless to the following conditions, namely:—

CONDITIONS.

1. This Permit may be cancelled or suspended at any time by the Governor in his absolute discretion and without any reason being assigned therefor.

2. All such vessels shall obey promptly the "Naval Silence Sign" (—●●●—●●●—●●●—) and thereupon shall not work or use their wireless telegraphy apparatus until after the "Message Complete Sign" (●●●—●●●—) shall have been made.

3. The above company shall render every assistance possible as required by the Postmaster-General by furnishing information in respect of incoming mails carried by the ships of the said company.

4. All information received as to the weather being experienced by the vessels of the said company at sea must be forwarded to the Harbour Office for transmission to the Observatory or sent to the Observatory direct whichever may be the more expeditious. The information should give the date and time of the observation, the position of the ship, the reading of the barometer, the direction and force of the wind, and the state of the sea and weather.

Dated at Hong-Kong, this
day of _____ 19 _____

Fee \$2 received.

Colonial Secretary.

SCHEDULE.

Colonial Secretary.

HONDURAS

(See also Map Section)

Including : Swan Island.

HONDURAS is a Republic, proclaimed September 15th, 1821, and is governed under a charter proclaimed October, 1894. The Legislative Power is in the hands of a Congress of Deputies, chosen for four years directly by popular vote, in the ratio of one per 10,000 inhabitants. The executive authority rests with the President, nominated and elected by popular vote for four years. The Republic is administered by a Council of six ministers.

The area of the Republic is about 44,275 square miles, with a population of 637,114. It lies between the Atlantic on the north and the Pacific on the south.

Swan Island is situated in the Caribbean Sea, about one mile wide and two miles long, some 900 miles South of New Orleans and 90 miles North-west of Honduras. This has no harbour and is difficult to approach in all but calm weather.

CONTROL AND ORGANISATION.

The first wireless station was installed during 1912 at the port of La Ceiba by the Vaccaro Brothers Railroad and S.S. Company.

In 1914 the Tela Railroad Co. (a subsidiary of the United Fruit Co.) opened a station for the Banana Industry. A year or two later a similar station was built for the Truxillo Railroad Co. (also a subsidiary of the United Fruit Co.) at Puerto Castella, both of these stations, communicating with the Radio Friut Company's system. A new station is now under construction at Tegucigalpa.

There are other stations at Cuyamel, Tela, and Trujillo.

All these stations belong to private companies, and are without any co-ordination, being used only by the various companies to maintain communication with their own steamers. Under favourable atmospheric conditions they can work with New Orleans, but ordinarily they communicate with the Isla del Cisne (Swan Island), in the Caribbean Sea. They are more or less of the type of that at Tela, which has a transmitter of 5 kW., and aërials sustained by towers 250 feet high.

The Government has recently ordered a course of wireless to be included in the studies of the Military School at Tegucigalpa, and has installed a teaching set. There are no manufacturing plants in the Republic.

The owners of Radiotelegraphic stations situate on Swan Island are the United Fruit Co. who have there a relay station between New Orleans and Burrwood La., and their plantations in Columbia, Panama, Nicaragua, and the Gulf. They installed the original spark apparatus which was replaced by Fessenden's Sincronons spark sets. This station on Swan Island was entirely re-equipped in 1912 by the Marconi Wireless Telegraph Co. of Canada.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address</i>
Excmo. Señor don Jesus M. Alvarado	Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa
Licenciado don Antonio Castillo Vega	Sub-Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa

ADMINISTRATION.

According to the Law of Telegraphs of the Republic, this branch of Telegraphy is the exclusive right of the State, but this right has been made over to private companies on the north coast, in the form of concessions.

A Decree of July 16th, 1920, declares for the necessity of providing a modern and effective service of communication in order to aid international and domestic official relations and to provide a news service for the National Press, on commerce, industry, and social relations generally.

To this end the sum of two hundred and fifty thousand colones has been voted for the purchase and installation of a radiotelegraphic and radiotelephonic station, situated preferably at the capital of the Republic, of sufficient power to communicate with places where radiotelegraph, radiotelephone, cablegraph or telegraph stations may be open for public service. Also from this same sum a number of smaller stations in the scattered regions of the National territory and preferably in the Cantons of Osa, Puntarenas, Liberia, and Sixaola are to be provided.

The following are the conditions under which private companies are granted concessions to instal and work radiotelegraphic and radiotelephonic apparatus :—

“The concessionaire has the right to construct, maintain, and use, in order to direct the service of his steamships, and those contracted by him, wireless stations; these cannot be placed in public service without previous arrangement with the Government. The said Government shall have the right, in times of peace or of war, to use such installations, without remuneration for the concessionaire, and even to direct and control, exclusively, the service of same, by its own employees.”

These concessions granted by the Government were approved by Congress.

Legislation relating to wireless telegraphy and telephony is up to the present contained in the following Decree :—

A.—Decree No. 34 Licenses.

EXECUTIVE POWER.

No. 34.

FRANCISCO AGUILAR BARQUERO,
*Provisional President of the Republic of
Costa Rica.*

DECREES :—

ARTICLE 1.—Wireless telegraphy and wireless telephony which are services of public utility are declared to be State monopolies. The concession and right to exploit them can only be obtained for a limited time and by means of a contract, which to be valid must have the approval of the Legislative Power.

ARTICLE 2.—There can be no question of a concession regarding the perpetual right reserved to the State for the establishment of radiographic stations in the Republican territory for military purposes and for transmitting and receiving official messages.

ARTICLE 3.—The Executive Power may in accordance with the Regulations which it may prescribe authorise amateur and training Institutes to install radiographic apparatus for experimenting, provided they do not violate the secrecy of correspondence of other wireless communications, nor disturb their working, nor use their apparatus for commercial purposes.

ARTICLE 4.—The establishment, management, and exploitation of wireless telegraph and wireless telephone enterprises for international service can only be permitted to those of Costa Rican origin, individually or in a body, under the supervision and protection of the State. A

concession so obtained both the capital and enterprise devoted to it shall be unrestricted and may not be transferred in any case or for any reason without the previous consent of the Constitutional Congress.

ARTICLE 5.—Licenses granted for installations at present established in the country may be revoked at any time and the plants thereof taken over by the State, by a corresponding indemnity beforehand.

Given at the Presidential House, San José, on the tenth day of April, nineteen hundred and twenty.

FRANCISCO AGUILAR BARQUERO.

The Secretary of State for Foreign Affairs,
ANDRES VENEGAS.

*The Secretary of State for Home Affairs
and Police,*
CARLOS M. JIMENEZ.

*The Secretary of State for Finance
and Commerce,*
CARLOS BRENES.

The Secretary of State and Public Works,
P. PEREZ ZELEDON.

The Secretary of State for Public Instruction,
J. GARCIA MONGE.

*The Secretary of State for the War Office
and Admiralty,*
AGUILES BONILLA G.

This Decree was ratified on July 16th, 1920 by the Constitutional Congress.

HUNGARY

(See also Map Section)

HUNGARY is a kingdom under a Regent styled officially "Protector of the Magyar Republic." It is situated in Central Europe, having Czechoslovakia on the north, Austria on the east, Roumania on the west, and the Kingdom of the Serbs, Croats and Slovenes on the south. It has an area of 35,654 square miles, and a population of 7,840,832.

CONTROL.

Radiotelegraphy is at present controlled by the Director-General of Posts and Telegraphs who is responsible for the promulgation of all laws and regulations relative thereto.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mons. Charles Demény	Secretary of State and Director-General of Posts and Telegraphs	Budapest

ORGANISATION.

A large station, with a range of 3,000 km., situated at Csepel, near Budapest, was established on November 18th, 1914, and during the year 1921 was equipped with a 5 kw. valve C.W. transmission set. Traffic can now be sent either by this or the old quenched spark equipment. This has been augmented by a special station to receive news, &c., messages from Nauen.

Considerable radiotelegraphic and telephonic developments are in course of development. Wireless apparatus has been installed in many of the schools throughout the country. No stations exist for aviation or meteorological purposes.

ADMINISTRATION.

A law concerning aviation in connection with radiotelegraphy is in course of preparation, but detailed particulars are not yet available. No arrangements are contemplated regarding Time and Weather Signals.

Radiotelegraphy is governed by the following law, the text of which is printed below:—

- A—Decree No. 62574/13, dated October 16th, 1913.
- B—Form of Ship License thereunder.
- C—Form of Certificate for Ship Stations.
- D—Form of Certificate for Operators.

DECREE OF THE HUNGARIAN MINISTER OF COMMERCE WITH REFERENCE TO THE FITTING UP OF WIRELESS STATIONS ON HUNGARIAN SEA-GOING PASSENGER SHIPS.

A In accordance with paragraphs 24 and 27 of the Supplement to my Order No. 60,805, issued on August 21st of the current year, in the matter of authorising the placing of service of commercial sea-going ships, the safety appliances provided on them and the provision of the navigation service in connection with working them, passenger liners already in service, which make regular voyages from Hungarian ports to points beyond Gibraltar or Aden and are carrying passengers, are to be fitted with wireless apparatus of the description specified below not later than by February 1st, 1915; new ships, on the other hand, must be fitted with such apparatus before they are put into service. Such apparatus must be sufficiently powerful to be able to send or receive messages under ordinary conditions over a minimum distance of 100 sea miles.

In order to carry out this decree I order the following:—

1. The owner (or charterer) is obliged to apply to the Hungarian Minister of Commerce for permission to establish a wireless station on board.

Such application must be accompanied in quadruplicate by a technical description of the apparatus to be used, with a diagram of the connections. Any subsequent alteration in the system, or remodelling of any description of the apparatus, which may affect its capacity for sending or receiving messages, must receive the preliminary authorisation of the Hungarian Minister of Commerce.

2. The arrangement of the wireless station on the ship must be up to date and comply with Rule 3 of the London International Wireless Agreement, so that the station may be able to work in harmony with the working of wireless stations using other systems and be able to exchange messages with such other stations. The system to be adopted and to be used will depend on the preliminary authorisation of the Hungarian Minister of Commerce.

The apparatus must be of such a type that it can be adjusted for waves 300 and 600 metres long and with these be able to send or receive 20 words at least per minute, counting five letters to the word.

In the case of applying subsections 2a to 2d of paragraph xxxv of the London International Wireless Service Regulations, the apparatus on the ship will be allowed to make use also of wavelengths of 1,800 metres.

3. All the machinery and materials for fitting up the wireless station on the ship must be acquired in the home country as far as possible.

Machinery and materials to be used for such purpose may only be acquired from abroad with the special permission of the Hungarian Minister of Commerce. Service books and similar other stores and office requisites for the working of the wireless service will be supplied at cost price by the Chief Post and Telegraph Administration.

4. All ships fitted either for continuous or restricted wireless service, must in addition to the usual apparatus be fitted also with apparatus for sending out wireless distress signals in conformity with Rule xi of the London Wireless Service Regulations as ordered by and in a manner fixed by the Hungarian Minister of Commerce.

Such apparatus for sending out wireless distress signals must be provided with its own separate power supply independently of any other power supply not used for the wireless service on board and must be of a design that it can be put in action expeditiously and be kept at work continuously for at least six hours and at the same time be powerful enough to send signals over a distance of at least 80 sea miles, on ships having a continuous wireless service and over at least 50 miles on ships with restricted wireless service.

This special installation for sending out distress signals may be omitted on all ships on which the regular wireless installation is able to fulfil these requirements.

5. The speed at which signals can be sent and received will be set out by the Hungarian Minister of Commerce in the document granting permission to establish a wireless service on a ship.

As regards new inventions for materially improving the efficient working of the apparatus and the speed of sending and receiving messages, the Hungarian Minister of Commerce may compel the owner (or charterer) of the ship to adopt such invention or inventions within a fixed period for the wireless station on his ship with due regard to existing practical requirements and a fair consideration of the expenditure incurred in connection therewith.

6. Under ordinary conditions the electrical power for working the wireless apparatus may not exceed one kilowatt. A greater power than this may only be used if the nearest station on the coast with which it is desired to exchange messages is situated at a greater distance than 200 sea miles or if on account of obstacles extant it is necessary to use the larger power (London Wireless Service Regulations, Rule viii).

7. The Chief Post and Telegraph Administration is empowered to have the wireless installation examined by its own inspectors at any period and to control the service.

The owner (or charterer) of the ship is obliged to afford to the inspectors of the Chief Post and Telegraph Administration, and with the intervention of this Administration to officers appointed by the Navy every facility to make themselves thoroughly familiar with the working in every detail of the wireless apparatus and gear and to acquire the necessary practice in working the apparatus.

Any stipulation on the part of the supplier of the apparatus that certain parts or details of the apparatus are to be kept secret and not to be shown to the inspectors of the Chief Post and Telegraph Administration or to officers of the Navy must not be accepted by the owner (or charterer) of the ship.

All inspectors and naval officers deputed to control or learn the working of the apparatus must be carried on the ship cost free by the owner (or charterer) of the ship in a class corresponding to their rank (with cabin accommodation in accordance therewith also free) and to charge them for their board at cost price.

Not more than two such persons, however, may travel on these conditions on the same voyage.

8. The nature of the service of the wireless station on the ship (whether public or special service, etc.), and its duration (whether continuous, restricted or service without special fixed hours), also the number and qualification (1st class or 2nd class) of the wireless operators, will be set out by the Hungarian Minister of Commerce in the document granting permission for the installation.

9. The Hungarian Minister of Commerce reserves himself the right to suspend at any time the wireless service on the ship for an indefinite period or permanently or in respect of certain special classes of messages without divulging his reason for so doing or without rendering himself liable to the payment of an indemnity.

In the case of an order for mobilisation in the Hungarian Monarchy being issued or in the case of war the wireless service on the ship is to be suspended altogether unless the captain of the ship receives special instructions to the contrary from the Chief Post and Telegraph Administration.

The captain of the ship will be held personally responsible for the carrying out of this regulation.

In other respects in time of mobilisation or war the owner (or charterer) of the ship is bound to carry out the special orders to be issued for the occasion.

10. Wireless operators to be employed may only be Hungarian citizens with a blameless record who can speak and write the Magyar language thoroughly and have obtained a certificate of qualification as regards wireless operating from the examining committee appointed by the Hungarian Minister of Commerce for the purpose.

The individuals thus qualified are to take the oath of loyalty in the presence of the examining committee, such oath to include promises to attend to their duty and to keep all messages secret, the fact of their having taken the oath being recorded on their certificate of qualification.

The wireless operators on board are subject to the discipline on the ship, must each possess their service books, and are to be placed on the list of the crew.

The owner (or charterer) of the ship is only allowed to have such individuals trained for the wireless service who have been chosen by the Hungarian Chief Post and Telegraph Administration for such purpose from a preliminary list of candidates submitted to the Administration.

Every wireless operator whose certificate is cancelled by the Hungarian Post and Telegraph Administration is to be dismissed immediately.

The owner (or charterer) of the ship is bound to give immediate notice of any change in the personnel of wireless operators to the Chief Post and Telegraph Administration and to the Hungarian Naval Authorities.

11. Every wireless station established for public service may be used by the public for sending wireless messages against payment of the proper fees.

The tariff of fees for wireless messages is fixed by the Hungarian Minister of Commerce on the recommendation of the Company. These fees are retained by the owner of the wireless station on board.

12. Out of these fees received by the owner (or charterer) of the ship for wireless messages he is responsible for the portions due to the inland and foreign telegraph authorities for forwarding messages.

In administrative matters the owner (or charterer) of the ship, or the wireless station on board, may only communicate with foreign telegraph administrations or with the International Bureau at Berne of the Telegraph Association through the Hungarian Chief Post and Telegraph Administration.

13. In conformity with Rule 3 of the London Wireless Agreement the wireless station on board is bound to enter into communication with every wireless station ashore or established on any ships regardless of the system used by such stations for the purpose of exchanging messages, and in accordance with Rule 9 the wireless station on board is compelled to accept distress signals from any source whatever, to reply to these and to take the necessary steps.

Wireless stations established on ships are to pay particular attention to the working of stations on the coast. The wireless station on board is to be kept in perpetual and efficient working order in order to be able to keep up faultless communication with the coastal stations.

At the request of the coastal station the wireless station on board is bound to stop its message immediately.

14. The working of the wireless station on board and the accounting for the fees received by such station are to be governed by the London Wireless Agreement and the service regulations attached thereto, by the St. Petersburg Telegraph Agreement and the service regulations attached thereto, and also by any orders already issued or to be issued by the Hungarian Chief Post and Telegraph Administration.

The wireless station, or the shipowner (or charterer) respectively, is bound to conform with the legal enactments and orders issued with reference to matters relating to the telegraph, telephone and electric signals.

During a stay in foreign ports the wireless station on board is bound to conform with any special rules which may be in force in the country of its sojourn besides those prescribed by the International Wireless Agreement and the regulations attached thereto.

It is the duty of the shipowner (or charterer) to make himself acquainted with these.

15. As an acknowledgment of the sovereignty of the State and in order to defray expenses incurred in the ordinary control of the wireless station on board, the owner (or charterer) of the ship is bound to pay on the dates named, and at the receiving offices named in the document granting permission for the establishment of the wireless station, twenty (20) crowns per station per annum.

Should it become necessary to institute an inquiry owing to any neglect or fault on the part of the owner (or charterer) of the ship or one of his employees and should the enquiry establish any neglect or fault on the part of the owner (or charterer) or one of his employees, the owner (or charterer) will be bound to indemnify the Treasury for all expenses incurred in connection with such enquiry.

16. In every case of neglect or fault in or about the wireless service the Hungarian Chief Post and Telegraph Administration may mulct the owner (or charterer) of the ship in a penalty not exceeding 100 crowns providing such acts of neglect or fault do not constitute a misdemeanour or crime.

17. If after repeated warnings the wireless station on board should not do its duty, or if the working of the station should militate against public interests, the Hungarian Minister of Commerce is empowered to inflict a heavier penalty of 100 to 1,000 crowns or to issue orders to have the working of the wireless station entrusted to an individual appointed by the Minister at the expense and responsibility of the shipping undertaking, and at the same time the Minister is to have power to have all faults made good in the apparatus and have all the necessary alterations made in the apparatus at the expense of the owner (or charterer) of the ship, or as an alternative to suspend or cancel the permit for the wireless station on board.

18. The permit for the establishment and working of a wireless station on board cannot be granted for a period exceeding 20 years.

At the expiration of the period mentioned in the document granting permission the whole installation with all its accessories (including furniture and fittings) and eventually also the installation for sending out distress signals are to be handed over to the Hungarian Post Office in full efficient and faultless working condition free of charge and without liability.

Should the Hungarian Post Office not wish to take charge of the working of such wireless station thus come into their possession, but to leave it further in the hands of the owner (or charterer) of the ship, the owner (or charterer) is bound to pay twenty (20) crowns per annum over and above the fee mentioned in Clause 15 in acknowledgment of the right of ownership of the installation thus acquired by the State.

A permit given for the establishment of a wireless station on a ship is automatically cancelled by the putting out of commission of the ship and the owner (or charterer) of the ship is obliged to give notice of this to the Hungarian Chief Post and Telegraph Adminis-

tration. Should it be desired to transfer the wireless installation to another ship a fresh permit for so doing will be required.

19. Moreover, the Hungarian Minister of Commerce has full power to cancel temporarily or permanently the permit for the working of a wireless station at any time even before the expiry of the period for which such permit has been granted and to cancel it without assigning any reason for his decision and to take over the working of the installation or to have it dismantled.

In the case of the working of the installation being taken over temporarily by the Ministry, the owner (or charterer) of the ship is bound to hand over for use free of charge and without any indemnity the whole of the installation with all the apparatus, fittings and stores for working same, also the cabin and locality in which the installation is housed, together with the sleeping cabins of the wireless operators; also to supply free of cost the power required for working the installation and supply the food, render all medical service and provide attendance and other necessities required by the operators. As against this, however, all fees paid for wireless messages will be handed over to the owner (or charterer) of the ship.

The terms of the final taking over of the installation are or will be specified in the permit or in the special order issued for the purpose.

Before the installation is taken over finally under the ordinary conditions six months' previous notice will be given, but the Hungarian Minister of Commerce reserves himself the right to shorten this period if public interests should necessitate this step or even to take over the installation at any time without any previous notice whatever.

20. Should, in the unchallengeable opinion of the Hungarian Minister of Commerce, public interests require it, the Hungarian Chief Post and Telegraph Administration may—through the courts of law and without incurring any liability in respect of claims for indemnity—issue orders for any vessel being fitted with wireless installation at the expense of the Treasury to have the service maintained and to have the installation dismantled when its use is no longer required by public interests and to arrange for certain compensation being arranged in connection therewith to the owner (or charterer) of the vessel.

21. The Hungarian Minister of Commerce reserves himself the right to grant exemptions from the above regulations from case to case in conformity with practical requirements.

Hungarian Minister of Commerce.

N.

V. 191.

LICENSE.

B SEC. 1.—The Minister grants a license to
to install a public wireless service station on his ship named
carrying passengers and to work such station during the period while the license remains in force under the conditions specified below.

SEC. 2.—The person to whom the license is granted is obliged to comply with the following:—

(a) With the provisions contained in Section XXXI of the Law of 1888 and with Decree No. 23445 issued in July 1890 for carrying out this law, as well as with Decree No. 62574 issued on October 16th, 1913, for establishing wireless stations on Hungarian passenger ships.

(b) With the provisions of any law to be enacted in future as well as of any ministerial decree or order already issued or to be issued in future by the Hungarian Post Office with the same object in view.

(c) With the orders contained in the International Wireless Agreement and its service regulations.

(d) With the conditions laid down in the present license.

SEC. 3.—The grantee is obliged to establish the installation on board in accordance with the "Telefunken" system in a manner complying in every respect with the requirements laid down in the Wireless Service Regulations, Rule III, sub-sections 1 and 2, Rule VII, sub-section 2 and Rule VIII.

The normal distance over which the installation is to be able to exchange messages is to be at least 200 sea miles by day and at least 300 miles by night.

The normal wavelength of the installation is fixed by the Minister at 600 metres with the reservation laid down in Rules III and XXXV of the International Wireless Service Regulations.

SEC. 4.—The holder of this license is obliged to instal besides the ordinary service installation on board an auxiliary installation in conformity with Rule XI of the International Wireless Service Regulations.

SEC. 5.—The holder of this license undertakes to maintain permanently the two installations mentioned in sections 3 and 4 in good serviceable working condition and to introduce all improvements in accordance with the progress made by the science of wireless telegraphy.

The Minister reserves himself the right to compel the holder of this license to adopt all new inventions of wireless practice materially enhancing the reliability and speed of exchanging messages.

All machinery, apparatus and materials to be used in fitting up the installation on board are to be obtained inland as far as possible.

Machinery, materials and apparatus of this kind may only be obtained from abroad with the special sanction of the Hungarian Minister of Commerce.

SEC. 6.—The holder of this license has no right to alter the system of the wireless installation on board mentioned in Section 3. Generally speaking the Minister's preliminary consent must be obtained for any alteration whatever in the installation as described in the technical description or in the diagram of connections both forming a complementary part of the present license.

SEC. 7.—The holder of this license and his employee in handling the wireless apparatus and maintaining the wireless service must act in conformity with the International Wireless Agreement and the Service Regulations attached thereto with the rate of telegraph fees and also with parts I and II of the telegraph service rules and orders issued by the Chief Post and Telegraph Administration.

SEC. 8.—The Minister fixes the call signal of the station in the H A B group of letters, its character is to be a "P G station for public

correspondence" in conformity with sub-section 4 of Rule V of the Wireless Service Regulations. As regards hours of service the wireless station is to be classed in the second category—i.e., stations with restricted hours of service in accordance with the provisions of Rule XIII, sub-section 3 of the Wireless Service Regulations.

The official hours are to be from 8 a.m. to 8 p.m.

In accordance with Rule XIII sub-section 3 of the International Wireless Service Regulations—during the periods of sailing over and above the official hours named—operators must be at their posts ready to receive messages and stay there permanently during the first ten minutes of every hour.

SEC. 9.—In conformity with the office hours fixed in section 8 the holder of this license undertakes to employ at least one first-class operator for attending to the service of the wireless station on board in accordance with Rule X sub-section 2 and the Wireless Service Regulations.

SEC. 10.—This operator, like all other wireless employees, must be a Hungarian citizen of blameless character who is able to write and speak the Magyar language perfectly and is the holder of a certificate of qualification for wireless operating from an examining body appointed for the purpose by the Hungarian Minister of Commerce.

The qualified individuals must take the oath of loyalty in the presence of the examining body, such oath to include promises of due attendances to their duties and to keep all messages secret, the fact of having taken this oath is to be testified in their certificate of qualification.

The employees in the service of the wireless station on board are subject to the discipline of the ship, they must be provided with service-books of the ship and enrolled on the register of the crew.

As regards the wireless service these employees are subject also to the Chief Post and Telegraph Administration and must comply with the directions issued for the proper performance of the service.

The owner (charterer) of the ship may only train such individuals for the wireless service whose training is permitted by the Hungarian Chief Post and Telegraph Administration after preliminary notice of such intended training has been given to the Administration.

Every wireless employee whose certificate is withdrawn by the Hungarian Chief Post and Telegraph Administration must be dismissed immediately.

The owner (or charterer) of the ship must give immediate notice of any change in the personnel of the wireless staff to the Chief Post and Telegraph Administration and also to the Hungarian Naval Authorities.

In accordance with Rule X sub-section 4 of the Wireless Service Regulations "the service of the wireless station on board is under the chief supervision of the captain of the ship." Hence the holder of this license must order the captain of the ship to take the oath of loyalty and for the preservation of the secret of messages, before a representative of the Hungarian Post Office.

SEC. 11.—The wireless station is intended for public correspondence and may therefore be used by anybody for sending messages against payment of the prescribed fees and observance of the rules laid down for the telegraph service.

On the other hand, in accordance with Rule 3 of the International Wireless Agreement the wireless station on board must exchange wireless messages with any and every other such station on shore or afloat—irrespective of the system used by such stations for receiving or sending wireless messages.

The operators of the wireless station on board must refuse to accept any message which, if transmitted to any part of the territory of Hungary, may endanger the safety of the Hungarian State, or the contents of which may form a breach of the country's laws or offend against public order or morality.

Should the person handing in the message still insist on its transmission the captain of the ship is to be appealed to, whose decision in this matter is to be considered final.

SEC. 12.—The fee for transmitting a wireless message from the ship is fixed at 40 fillérs per rateable word with a minimum fee of 4 crowns per message.

The Minister, however, reserves himself the right to modify this rate of fees at any time even during the duration of this license or to fix a new tariff for messages sent.

SEC. 13.—The fees referred to in the previous section may be retained by the holder of this license.

Messages which at telegraph stations of the State are accepted for free transmission or are transmitted on the credit system must be accepted and transmitted by the holder of this license on the same terms.

SEC. 14.—In dealing with telegrams and preparing accounts the wireless station on board must only use dating stamps, printed forms and books that are prescribed for use and are issued for this purpose by the Hungarian Post who will supply them to the holder of this license at cost price on his written application to the Chief Post and Telegraph Administration.

The holder of this license is obliged under all circumstances to keep within easy reach a copy of each of the following service books for the use of the wireless station staff on board—the International Telegraph Agreement with the Service Regulations pertaining thereto, the International Wireless Agreement with the Service Regulations pertaining thereto, the *Nomenclature Officielle des Bureaux Télégraphiques*, the *Nomenclature Officielle des Stations Radiotélégraphiques*, the *Liste Alphabétique des Indicateurs d'Appel*, the book of telegraph rates and Parts I and II of the Telegraph Service Regulations, the book of telegraph fees issued for Hungarian wireless stations on ships, and also a copy of the Post and Telegraph Instructions. The holder of this license must also take care that all these books are corrected and kept up to date by the wireless staff in conformity with the additions and corrections periodically issued by the International Telegraph Bureau and in the collection of Postal and Telegraph Regulations.

SEC. 15.—The holder of this license is fully responsible financially for all claims of every kind raised on any legitimate grounds against the Hungarian Post Office by anybody for the return of fees paid or indemnification in cases arising from the service of the wireless station on board his ship.

The holder of this license is fully responsible financially for all telegraph fees of every kind payable under International agreements in accordance with telegraph tariffs arising from the telegraph service of the wireless station on his ship.

These fees—at the financial responsibility of the holder of this license—are collected in cash by the staff of the wireless station on his ship who are bound to keep and render correct accounts and also supply a list of all the wireless messages received, sent or relayed by the station. The Chief Post and Telegraph Administration issues proper forms for making out such accounts and lists with the necessary instructions for dealing with these forms.

The holder of this license or the manager of the wireless station in his place—in accordance with Rule XL of the International Wireless Service Regulations—must once a month or in any case within eight days of the ship's return to port from every voyage send at the expense of the holder of this license to the Section III of the Adult Department of the Ministry of Commerce the following papers and documents carefully arranged and packed: the originals of all wireless messages, all records of messages transmitted all receipts for delivery of wireless messages received and all documents and accounts in connection therewith.

Prior to this, however, the holder of this license or the manager of the wireless station in his place must prepare an account of all fees received in connection with the working of the wireless station on board and after deducting the fees due to the holder of this license or to the wireless station on board he must pay in the remaining balance at the Hungarian Post and Telegraph Office No. 1 duly receipting on the account the sum retained by the station on the ship of the holder of this license.

The holder of this license or the manager of the wireless station on board respectively may only communicate with foreign telegraph authorities or with the International Bureau of the Telegraph Association at Bern through the medium of the Hungarian Chief Post and Telegraph Administration.

SEC. 16.—In home ports the wireless station may not transmit telegrams unless specially authorised to do so by the Chief Post and Telegraph Administration.

When visiting foreign parts, any special regulations in force in the country of sojourn must also be respected in addition to the regulations of the International Wireless Agreement and the Service Rules prescribed therein.

It is the duty of the owner (or charterer) to make himself acquainted with these.

SEC. 17.—The Hungarian Chief Post and Telegraph Administration may at any time have the wireless station examined by their inspectors and its service checked.

The owner (or charterer) of the ship undertakes to afford means to the inspectors of the Hungarian Chief Post and Telegraph Administration, as well as to officers of the Navy, through the mediation of the Hungarian Chief Post and Telegraph Administration to make themselves thoroughly acquainted in every detail with the handling of the wireless apparatus and to acquire the necessary practice therein.

The owner (or charterer) of the ship must not consent to any stipulation on the part of the supplier of the wireless apparatus that the arrangement of the apparatus or any part thereof should be kept secret and not be shown to the inspectors of the Hungarian Post and Telegraph Administration or to the officers of the Navy.

The owner (or charterer) of the ship undertakes to carry the inspectors and naval officers thus appointed for the study of the apparatus and training in its manipulation free of charge in a class of the ship corresponding to their rank, also to find them, free of charge, cabin accommodation and to make it possible for them to pay for their board at cost price.

Two such persons, however, may only travel on the ship on the same voyage.

SEC. 18.—As an acknowledgment of the right reserved to the State and to defray the costs incurred in the regular control of the wireless station on board, the holder of this license undertakes to pay the sum of twenty (20) crowns to the Post and Telegraph Office No. 1 within the first half of January every year.

Should an enquiry become necessary owing to any alleged neglect or fault on the part of the owner (or charterer) of the ship or one of his employees, and should such enquiry prove that the holder of this license or his employee is at fault, the holder of this license would be obliged to refund to the Treasury the whole of the costs arising from such enquiry.

SEC. 19.—The Hungarian Chief Post and Telegraph Administration has the power to telegraph the holder of this license in a penalty not exceeding 100 crowns for any neglect or fault in the wireless service provided such omission or commission does not form an act of misdemeanour or a crime. If the wireless station on board should not attend to its duties after repeated warnings, or should the service of the station clash with the public interests, the Hungarian Minister of Commerce shall have the power to inflict eventually a higher penalty of from 100 to 1,000 crowns or to make arrangements to have the wireless service of the station performed by a delegate of the Minister specially appointed for the purpose at the expense and responsibility of the shipping undertaking, and to have any apparent shortcomings in the arrangement of the wireless apparatus put right and any required alterations made at the expense of the holder of this license, or as an alternative the Minister may suspend or cancel the license for the working of the wireless apparatus.

SEC. 20.—The period during which the present license will remain in force is ten (10) consecutive years counting from the date of the license.

Should the holder of this license not install the wireless apparatus within a year counted from the date of the present permit, this permit will be cancelled and the holder of the license will have to return it for cancellation to the Minister.

SEC. 21.—In accordance with the provisions of Section XXI subsection 3 of the Law of 1888 and in conformity with the decree issued by the Minister of Commerce under No. 62574/1913 in the matter of establishing wireless stations on sea-going passenger ships, the whole of the wireless installation with all its accessories (including furniture, fittings), as well as the installation for sending out distress signals, is to be handed over to the Hungarian Post Office in perfect working order free of cost and without any claims at the expiry of the period specified in the present license.

Should the Hungarian Post not wish to undertake themselves the service of the station thus handed over to them but to leave its further working in the hands of the holder of this license, the owner (or charterer) of the ship undertakes to make an annual payment of twenty (20) crowns in acknowledgment of the

proprietary right over the installation thus acquired by the State over and above the payment specified in section 13 payment of both sums to be made simultaneously.

Should a ship be put out of commission the license for the maintenance and working of the wireless station thereon becomes null and void and the holder of this license shall give the Hungarian Chief Post and Telegraph Administration due notice of the fact. Should it be desired to transfer the wireless installation and re-erect it on another ship, this can only be effected under a new license.

SEC. 22.—The Minister reserves himself the right to take possession temporarily or permanently, on behalf of the State, of the wireless station at any time even before the expiry of the present license without giving any explanation whatever for taking such a step.

Should the installation be taken over temporarily the holder of this license undertakes to hand over for use free of charge the whole of the apparatus with all accessories, fittings and stores for working it as well as the office wherein it is housed and the cabins for the accommodation of the operators without any claim for indemnity, also to supply free of charge the power required for working the installation, also to provide free of charge all necessities (board, medical assistance and servants, etc.) required by the operators. As against all these services all fees collected for wireless messages are to be handed over in this instance also to the holder of this license.

Under normal conditions six months' previous notice will be given if the installation is to be taken over permanently, but the Hungarian Minister of Commerce reserves himself the right to shorten the period of this notice or to take possession of the station at any time without any notice at all, should public interest call for such a step.

Should the working of the installation be taken over by the State permanently before the expiry of this license, the Hungarian Post Office will indemnify the holder of this license for the technical parts of the wireless apparatus by paying him the cost as per invoices or other evidence to be produced by him less ten (10) per cent. for every year during which the installation has been in use. The balance thus remaining will be paid to him by the Post and Telegraph Administration at Budapest.

Beyond this indemnity to be paid to him the holder of the license shall not be able to sue in any court for any claim for loss of profit or for the payment of any other indemnity under any other pretext whatever.

SEC. 23.—The Minister reserves himself the right to suspend at any time the service of the wireless station for an indefinite period, or permanently, or for messages of a certain kind without having to assign any reason for such an order and without incurring any liability for damages caused by the suspension.

In case of an order being issued for mobilisation in Hungary, and in time of war, the wireless station on board is to be closed down altogether unless the captain receives instructions to the contrary from the Hungarian Chief Post and Telegraph Administration.

The captain will be held personally responsible for the compliance with this direction.

In other respects the holder of this license will have to carry out all special orders to be issued in times of an eventual mobilisation or war.

SEC. 24.—This license may only be transferred to another person with the Minister's special consent to be applied for in advance.

SEC. 25.—Should any difference of opinion arise between the State and the holder of this license as to the correct interpretation of any of the stipulations of the present license the matter or matters at issue shall not be referred to any Court of Justice but shall be settled by the Minister of Commerce in the usual official way, adopted by the Public Administration.

SEC. 26.—Every copy of the present license issued officially is subject to a fixed stamp duty amounting to two crowns.

Budapest, 19

By the Order of the Minister,
Chief Director of Posts and Telegraphs

CERTIFICATE.

C For the ship station on board the Hungarian vessel

The general administration of Posts and Telegraphs of Hungary attests that the ship station on board the Hungarian vessel was installed on the basis of the license of the Hungarian Government and that the installation of the ship station complies with the conditions prescribed by the service regulations annexed to the International Radiotelegraph Convention.

The ship station is classed in the category from the point of view of its obligations as to hours of service.

Normal range in nautical miles :

Day
Night

Budapest, the
General Administration of Posts and Telegraphs of Hungary.

CERTIFICATE.

D The Commission, delegated by the Hungarian Minister of Commerce, has submitted Mr. on the born at to an examination of the radiotelegraph service and tested his professional ability as regards :

(a) The adjustment of apparatus and knowledge of its working.

(b) The speed of—
Transmission
..... words per minute.
Reception by sound
..... words per minute.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph communications.

In testimony whereof the Ministry of Commerce of Hungary has, by virtue of Article X of the International Radiotelegraph Convention, issued this..... Class Certificate to Mr. who at the conclusion of the examination took the oath of secrecy of correspondence.

Made at..... the
..... 19

ICELAND

(See also Map Section)

ICELAND, known to the geographers of the ancient world as "Ultima Thule," lies in the North Atlantic Ocean between 63° 23' and 66° 33' N. latitude, whilst its longitude extends from 13° 22' to 24° 35' W. Its area is estimated as 40,500 square miles, with a population of 94,690.

Colonised in the ninth century by Vikings from Norway, the inhabitants were converted to Christianity by Irish monks, and in 1000 A.D. that religion was formally acknowledged by the State.

Originally an aristocratic republic, Iceland acknowledged the sovereignty of the King of Norway in the thirteenth century, and shared the union of the latter country with Denmark in 1388. On the partition of Europe in 1814, Denmark resigned Norway but retained Iceland.

On December 1st, 1918, an Act creating a Federal Constitution for Denmark and Iceland came into force, the two states remaining free and independent under the same sovereignty.

CONTROL.

The first wireless station erected in Iceland was designed and fitted for reception only, and was put up by the Marconi Company in 1905. It was shut down in 1908. The present installation at Reykjavik was erected by the same company for the Icelandic Government in the course of 1917-18, and was opened for public service on June 17th 1918.

Since 1919 the Government have erected four wireless telegraph and telephone coast stations, which have been put up by Icelandic technicians. All the Icelandic mail steamers and several trawlers are now fitted with Wireless Telegraphy.

All the coast stations and most of the ship stations are of the Marconi system.

The State has a monopoly in the erection and working of wireless stations, but private persons or companies may be permitted to do both under a license from the Telegraph Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Klemens, Jonsson	Minister of Public Works	Reykjavik
Mr. O. Forberg	Director-General of Telegraphs	Reykjavik
Mr. Frb. Adalsteinsson	Superintendent of Wireless Station and School	Reykjavik

Amateur Stations.—Three, only one of which is able to transmit.

Wireless Societies.—There are none devoted solely to radiotelegraphy, but the *Technical Society of Iceland* gives considerable prominence to the subject.

ADMINISTRATION.

The following legislative enactments govern wireless in Iceland :—

A—Act of November 14, 1917.

B—Regulations under the above Act.

ACT OF NOVEMBER 14TH, 1917, CONCERNING THE WORKING OF WIRELESS TELEGRAPH STATIONS IN ICELAND.

I.

A The State has a monopoly in the erection and working of wireless stations on Icelandic soil and within the territorial waters of Iceland.

II.

Within the territorial waters of Iceland, the wireless stations of foreign ships may only be in use in conformity with regulations drawn up by the Ministry of Iceland. The Ministry can prohibit all wireless communication within the territorial waters of Iceland, and take such precautions as may be necessary to ensure the observance of this prohibition.

III.

On board of Icelandic ships which do not belong to the Government, whether they are within or without the territorial waters of Iceland, wireless stations may only be erected and worked with the permission of the Ministry. If the stipulations accompanying this permission as regards the equipment and working of the station are not complied with, the Ministry can withdraw it. Applications for permission to work wireless stations that are in operation when this Act comes into force must be sent to the Ministry not later than eight weeks from the date of this Act. The Ministry will then decide how their future working is to be carried on.

IV.

On Icelandic soil, and within the territorial waters of Iceland, wireless stations, or other means of wireless communication, can only be installed and worked with the consent of the Ministry, and in conformity with the stipulations made by it.

V.

The Regulations contained in the fifteenth paragraph of the Telegraph Act of October 20th, 1905, imposing secrecy upon those engaged in the telegraph service, are equally applicable to wireless operators. Paragraph 16 of the same Act, regarding the same obligation of those engaged in private telegraph service, is also valid as regards wireless telegraph operators on board of ships.

VI.

The violation of this law, or of the Regulations which the Ministry are hereby empowered to make, shall be punished with fines, or with imprisonment for a term not exceeding six months, provided the violation does not involve a more serious punishment. Further, all apparatus illegally installed or worked shall be confiscated. Lawsuits arising from violations of this law, or the corresponding Regulations of the Ministry, shall be tried in public police courts.

B WIRELESS TELEGRAPHY AND TELEPHONY REGULATIONS.

I.

In the present Regulations :

(a) *Wireless station* means apparatus or other means of conveying signals to a distant point without any intermediate conductor.

(b) *Wireless operator* means a person employed in the operating of all sorts of apparatus for wireless telecommunication.

(c) *Ministry* means the Ministry of Iceland.

(d) *Wireless apparatus* means apparatus used for transmission and reception of intelligence between distant points, without any intervening conductor.

I.—ERECTION OF WIRELESS STATIONS.

II.

On Icelandic soil, or within the territorial waters of Iceland, or on ships registered in Iceland, a wireless station must not be erected or worked without a special permit of the Ministry, who will issue a license for such station. This license, or a certified copy of it, must always be kept at the station named therein. If the stipulations contained in this license are not complied with, it may be withdrawn and the station dismantled.

III.

Application for a license to erect and work a wireless station must be sent to the Director-General of Telegraphs.

The installation of wireless stations on board ships must comply with the stipulations of Paragraph VII of the International Regulations on Wireless Telegraphy.

A wireless station must not be opened for correspondence before the Director-General of Telegraphs has declared the equipment complies with the stipulations contained in the license.

2.—INSTALLATION AND OPERATION OF PRIVATE SHIP STATIONS.

IV.

The wireless apparatus of a ship station must always be maintained in strict accordance with the stipulations of the license.

V.

The Director-General of Telegraphs fixes the hours of service for each coast station.

Ship stations are, as regards hours of service, divided into three classes:

1. Stations permanently open.
2. Stations with limited hours of service.
3. Stations with no fixed hours of service.

During navigation a constant aural watch must be kept at stations of the first class. On stations of the second class watch must be kept during the hours of service, and also during the first ten minutes of each hour. At stations belonging to the third class no regular watch need be kept.

VI.

All ship stations must be so equipped as to permit both transmission and reception with 300 and 600 metre wavelengths; 600 metres is the normal wavelength of all ship stations.

An exception to this rule may be made in the case of small vessels, where it is difficult to produce a wavelength of 600 metres, when permission may be given to use 300 metre wavelengths for transmission, but every station must be able to receive wavelengths of 600 metres.

First and second-class ship stations must be fitted with an auxiliary transmitting set provided with an independent power supply, able to work for at least six hours continuously. This set must be fixed in as safe a position as possible, and must have a minimum range of eighty miles for first-class stations and fifty miles for second-class stations.

On ships where the main installation is such as to fulfil the conditions laid down for the auxiliary set, the latter is not required.

VII.

Ship stations should be operated by either one or two wireless operators licensed by the Director-General of Telegraphs.

Wireless operators holding certificates issued by foreign administrations may be permitted to operate ship stations, but a separate permit must be obtained for each voyage.

The certificate states:—

(a) That the holder understands the wireless apparatus and how to operate it.

(b) That the holder is able both to transmit and to receive Morse signals at a speed of not less than

(1) Twenty words a minute in the case of first-grade operators, and

(2) Twelve words a minute in the case of second-grade operators.

(c) That the holder possesses an adequate knowledge of the Regulations affecting wireless telegraphy.

Furthermore, the certificate contains the holder's pledge of secrecy, whereby he is subject to the same law as telegraph operators of the telegraph administration, and the same penalties for violation.

Second-grade wireless operators are permitted to operate ship stations which are only for the ship's own use or that of the crew. Furthermore, they are entitled to operate other stations having at least one first-grade operator

First-class ship stations are bound to be operated by at least two first-grade wireless operators.

Wireless operator's certificates must always be kept in the wireless cabin, where they can be seen by the radio inspectors of the telegraph department.

VIII.

So far as it is possible all ship stations are bound to exchange traffic with other stations, without regard to the wireless telegraph system of the station concerned. The exchange of traffic between ships must be so arranged as to interfere as little as possible with that of the coast stations, which are generally given priority in public correspondence.

As a general rule, the working of every station must be so arranged as to cause the least possible disturbance in the traffic of other stations. All unnecessary transmission of signs or words is strictly forbidden. Experiments and tests are only permitted in so far as they do not interfere with other stations. In such cases as little transmitting energy as possible and none of the ordinary wavelengths should be used.

In an Icelandic port the wireless apparatus of a ship must not be made use of except in case of:—

(a) The ship being in distress.

(b) The ship being in communication with a ship in distress.

(c) The ship being in a port where there is no telegraph or telephone station.

(d) The ship being, from some reason or other, unable to communicate with the shore otherwise than by wireless.

As regards (c) and (d) the permission of the nearest shore station within the ship's range must be obtained.

IX.

Whenever it is considered necessary, the telegraph department arranges an inspection of each ship's station by persons appointed therefor by the Director-General of Telegraphs. All their orders and arrangements relating to the maintenance and operation of the wireless apparatus must be closely followed. Inspectors are required to supply the Director-General with a report of the inspection of each station.

3.—HANDLING OF RADIOTELEGRAMS.

X.

All wireless stations, except those intended for a special limited correspondence (see Paragraph XI), are required to accept public correspondence.

Messages are divided into three classes:—

1. Government messages.

2. Service messages.

3. Public correspondence.

The handling of these messages on the land lines will be in accordance with the domestic and international regulations governing the telegraph service. The handling of radiotelegrams between wireless stations will be carried out in accordance with Paragraphs XIV-XV, XIX-XI, XLV-XLIX of the International Wireless Telegraph Regulations.

XI.

Ship stations may be utilised for:—

(a) General public correspondence.

(b) Limited public correspondence—e.g., light ships, cable ships, etc.

(c) Private correspondence (with special ships and fishing companies).

In general public correspondence the following special radiotelegrams may be accepted :—

1. Telegrams with reply prepaid.
 2. Telegrams to be collected.
 3. Telegrams to be delivered by mail.
 4. Telegrams to be delivered by express.
 5. Telegrams with certificate of delivery.
- This certificate is only issued as regards delivery from the wire to the nearest wireless station.

6. Paid service messages.
7. Express telegrams. These are, however, only transmitted as such along the ordinary land lines.

All stations are bound to give precedence to inquiries from ships in distress.

Ship stations have no responsibility as regards the exchange of radiotelegrams.

Ship stations that are open for general public correspondence will, against payment, be supplied with all printed forms, journals, etc., by the telegraph department; these stations are bound to be governed by all instructions of the Director-General of Telegraphs, as regards operation of the apparatus and handling of the traffic.

XII.

The complete charge for a radiotelegram includes :—

1. The wireless charges :—

(a) The shore fees (belonging to the shore station).

(b) The ship fees (belonging to the ship station).

(c) The transit fees (belonging to an intermediate land or ship station that may be required to handle the message).

2. The wire charges.

The shore charges in this country shall be 40 cents a word, and not less than 4 frs. for each message.

The ship fees are fixed by the shipowner with the approval of the Director-General. They must not exceed 40 cents, and the minimum charges must not be more than that for a ten-words message. Service messages *re* wireless traffic, that has only passed between wireless stations, are not free of charge on the land lines. Press telegrams at half rate are not accepted.

XIII.

The entire charge for handling a radiotelegram from sender to addressee is to be charged to the sender. It is not permitted to charge more than stated in the tariff books.

XIV.

Every shipowner is liable for all charges collected on board his ships.

XV.

Each ship station is bound to send, once monthly, all original radiotelegrams, with relative vouchers, to the Director-General of Telegraphs.

XVI.

Reimbursement of charges, and accounts with the Telegraph Department, are to be governed by the Paragraphs XLI and XLIII of the International Radiotelegraph Service Regulations.

4.—EXPERIMENTAL AND AMATEUR STATIONS.

XVII.

Those wishing to erect an experimental or amateur wireless station must send an application for permission therefor to the Director-General of Telegraphs.

The applicant must prove his ability to transmit and receive at not less than ten words a minute in the Continental Morse code, and that he possesses an elementary knowledge of the science of wireless telegraphy. The application must be accompanied by drawings, and an accurate specification of the station to be erected. Such stations will not be permitted to radiate waves of greater length than 200 metres.

In the event of a license being granted to such stations the licensee must sign a declaration of secrecy.

5.—OTHER STIPULATIONS.

XVIII.

The stipulations of Paragraph VIII, *re* use of wireless apparatus in ports, are also valid as regards foreign vessels.

XIX.

The Ministry may prohibit all radiotelegraphic communication within the territorial waters of Iceland, by both Icelandic and foreign vessels, and may make the necessary arrangements to enforce this prohibition.

The Ministry can, furthermore, exercise a censorship over all such radiotelegraphic traffic, and stop any radiotelegram that is considered to be harmful to the safety of the State.

XX.

Violations of these Regulations are liable to a fine not exceeding 10,000 krónur, or imprisonment for a term not exceeding six months, if the transgression does not involve a more severe punishment. Illegally erected or operated wireless apparatus will be confiscated.

Lawsuits arising from the violation of these Regulations will be tried in public police courts.

XXI.

These Regulations shall come into force immediately.

Date of Issue: May 17th, 1918.

IRELAND

(See also Map Section)

Including : The Irish Free State and Northern Ireland.

UNDER the Government of Ireland Act, 1920, a cabinet was appointed for Northern Ireland (June, 1921), and by a treaty between Great Britain and Southern Ireland in 1921 Southern Ireland became The Irish Free State; a provisional Government was appointed in 1922. The combined area of the two portions of Ireland is 32,586 square miles with a population of 4,496,000.

CONTROL.

The control of wireless telegraphy and telephony in Northern Ireland is at present administered from London, and the laws and regulations applicable to Great Britain also apply to Northern Ireland.

Up to the time of going to press we have been unable to obtain any information relating to the future of wireless in The Irish Free State.

ITALIAN SOMALILAND

(See also Map Section).

THE Colony and protectorates of Italian Somaliland, extend along the east coast of Africa from British Somaliland to the course of the Juba. Its area is 139,430 square miles and a population of 650,000. The administration is in the hands of a Governor.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to Italian Somaliland.

ITALY

(See also Map Section)

THE historic kingdom of Italy occupies the central position amongst the three great peninsulas of Southern Europe. Its area is 110,632 square miles, with a population of 36,120,118.

The present constitution of Italy is an expansion of the "Statuto Fondamentale del Regno," granted March 4th, 1848, by King Charles Albert to his Sardinian subjects. The executive power of the State belongs exclusively to the Sovereign, working through responsible Ministers; whilst the legislative authority rests conjointly with the King and Parliament, the latter consisting of two Chambers. King Vittorio Emanuele III, born November 11th, 1869, is a direct descendant of the Vittorio Emanuele who was declared King of Italy on March 17th, 1861, by the first Italian Parliament.

The association of Italy with wireless telegraphy has from the start been very close, and the land of his birth has in many different ways recognised what she owes to her distinguished son, Senatore Marconi.

CONTROL.

Wireless telegraph land stations in the Kingdom belong to the Government and are operated by the Ministry of the Navy (Department of Artillery and Armaments), the Ministry of Posts and Telegraphs and the Ministry of War. Each Ministry includes a special department for dealing with wireless telegraphy.

ADMINISTRATION.

A number of regulations have been compiled in regard to special wireless telegraphic and telephonic concessions. They are, however, not yet approved.

The current Rules and Regulations which we print below (and which cover the Italian Colonies) may be summarised in the following List. There are at present none relating to aviation:—

- A—Law of June 30th, 1910, No. 395.
- B—Regulations (No. 227) of April, 1912.
- C—Law of June 30th, 1912.
- D—Decree No. 1587, dated November 12th, 1916.
- E—Decree No. 2223, dated November 4th, 1919.
- F—Decree relating to private correspondence on board ships

A The following is known as the Law of June 30th, 1910, No. 395:—

ART. 1.—The establishment and exploitation of the radiotelegraphic and radiotelephonic installations are reserved to the Government, and in general of all those for which, in the State and in the Colonies, on land and on board ship, energy is employed in order to obtain distance effects without the use of conducting wires.

The Government has the right to grant to any person, public or private scientific or training institution, the authority to establish and to exploit installations of such a nature on land and on the passenger and mercantile vessels, for which previous concession must be obtained.

The license may be revoked upon the recommendation of the consulting Commission when the installations cause interruptions of State stations which were in operation prior to the concession, or when they do not comply with the technical conditions established in the license.

The exploitation of the installations granted can be revoked, suspended, or taken over by the Government in time of war or during peace whenever the Government may deem it necessary and opportune.

The Government has also the right to inspect, through its officials, those stations which are not the property of the State, in order to ascertain whether the stations are operated in accordance with the regulations.

ART. 2.—The Government administrations concerned in these services are the Ministry of Posts and Telegraphs, of War and the Admiralty; and special regulations determine the share of the respective departments in the execution of the present law.

A permanent consultative commission is constituted to give opinions upon international agreements, questions of a scientific nature, and upon doubtful points relating to the said services.

The Commission shall also decide every doubtful case which may arise of a technical character regarding the installation and exploitation of the concessions according to Art. 1.

The Commission shall be qualified to determine the power of the radiotelegraphic and radiotelephonic apparatus and technical and economic details for their use on vessels engaged in emigration traffic when the said apparatus has been installed by the Government according to Art. 11 of the Royal Decree, March 14th, 1909, No. 130.

Questions concerning indemnity on account of the cancellation of a license, suspension of exploitation, or redemption as per Art. 1, shall be referred to an arbitration tribunal, which shall decide, without right of appeal. This tribunal shall be composed of three members, one nominated by the Government, one by the licensee, the third by the President of the Tribunal in Rome. The Government can leave to the said Commission the selection of its own arbitrator.

Where several licensees are interested parties to a dispute, and they are unable by mutual agreement to nominate an arbitrator, each shall submit the name of an arbitrator, and the choice will be made by drawing lots in the presence of a judge of the Tribunal of Rome.

The composition of the Commission in the present article and the rules of its working have been determined in the regulations.

ART. 3.—Every infringement of Art. 1 of the present law is punishable by a fine up to £2,000 (Italian) and with imprisonment up to one year, which penalties may be imposed separately and together according to the circumstances. It is in the power of the judge to add to the said penalties the confiscation of the apparatus.

During criminal proceedings the Administration can, in virtue of decree by the prefect, and at all times that in the opinion of the prefect would be in the public interest, obtain immediate possession of the installation and provide if necessary for its removal.

Any person will incur the same penalties if he should avail himself of the installation on board commercial or passenger vessel when they are at anchor in the State waters, except in case of danger or other special cases, which will be dealt with in the regulations.

ART. 4.—If any person shall cause damage or deterioration to installations, or in any other manner interrupt, or cause interruption of the service, even temporarily, he will be liable to the penalties laid down in Art. 315 of the Penal Code, except in the case of military interference with military stations for which offence the penalties stated in the military Penal Code will be imposed.

If any person should abuse the use of the distress signal of the vessels in danger, he will be subject to the same penalties.

ART. 5.—The penalties established by the present law are understood to be applicable, without prejudice to greater offences which may take down in Art. 315 of the Penal Code, except in the case of military Penal Code.

B The following regulations (No. 227) were published in April, 1912, for carrying out the Act of June 30th 1910 (No. 395):—

SECTION I.

1. The Ministry of Posts and Telegraphs shall have under its control:—

(a) The installation and exploitation of the stations for public service and constituting the interior network of the State and of all those opened for international communication.

(b) The verifications, inspection and control of the material and working of the service of all the land installations exploited in virtue of Government license.

(c) The tariff regulation for communication between all land stations and ship and shore stations, also accounting.

The Minister of War shall have under his control:—

The installation and working of stations destined exclusively to the military service, including movable field stations for use in the R. Army. In time of war the management of the service (either a part or all the stations destined to the public service) can be taken over by the military administration. The Admiralty shall have under its control:—

The installation and exploitation of the ship stations of the Royal Navy, private and mercantile; the verifications, inspections and control of the materials and of the working of the service of the installations made for passenger and mercantile traffic.

SECTION 2.

2. *Permanent Consulting Radiotelegraphic Commission.*—The Permanent Consulting Commission is composed of a President not belonging to the Government Administration, two members selected amongst persons of well known ability in electric and radiotelegraphic

science, a superior officer of the Royal Navy attached to the General Staff, and a superior officer attached to the office of the Chief of the General Staff of the Royal Navy.

The following are members of the Commission by right:—

(1) The Director of Posts and Telegraphs Higher Institution.

(2) The Director in Chief of the Radiotelegraphic Department of the Posts and Telegraphs.

(3) The Officer-Director of the Radiotelegraphic Department in the Army Office of Rome.

(4) The Superior Officer of the General Staff of the Royal Navy, Chief of the Department of the Submarines, Electric Material and Radiotelegraphic Service at the Admiralty.

Three members, selected amongst the three mentioned Administrations, will act as Secretaries.

3. The President, members and secretaries will be nominated by Royal Decree, proposed by common accord, by the Ministers of the Posts and Telegraphs, Admiralty, and War.

By Ministerial Decree extraordinary members, without vote, can be added temporarily, these to be selected from persons of well-known skill, proposed by the President of the Commission.

4. The Commission shall have its office at the Admiralty in Rome. The meetings of the Commission are to be convened by the President at the request of the interested Administrations.

5. The opinion of the Consulting Commission can be asked on the following subjects:—

(a) On the compilations of arrangements and special rules for the technical organisation of the radiotelegraphic and radiotelephonic service of the State, as well as for practical rules for the constitution and exploitation of the installations.

(b) On all questions of a scientific nature, and doubtful cases referring to the radiotelegraphic and radiotelephonic services.

(c) On International Conventions.

(d) On technical conditions with reference to licenses of radiotelegraphic and radiotelephonic stations.

(e) The establishment, before granting the license, of indemnity due in case the installation should be repealed, suspended, or taken over by the State according to paragraph III. Art. 1 of the law.

(f) Repeal of the licenses.

(g) On the adoption of new radiotelegraphic and radiotelephonic systems, and on the application of same by the Government service, unless they should deal with interesting systems concerning the defence of the State.

The qualified Administrations may whenever they think it warranted ask the opinion of the Commission on any subject.

The Commission is entitled to avail itself for its own study of the working rooms and of the Government experimental stations, but a previous application must be lodged with the Administrations.

6. The expenses for the working of the Commission are to be divided amongst the three Administrations interested.

SECTION 3.

7. *Licenses for the Exploitation of Radiotelegraphy and Radiotelephony.*—Licenses to persons, to institutions, and to public and private Administrations for the installation of any radiotelegraphic or radiotelephonic station

will be granted in virtue of an agreement containing the conditions to be observed, by a decree issued by the Ministry of the Posts and Telegraphs, acting in harmony with the Ministry of War and the Admiralty.

Such licenses cannot last longer than February 16th, 1917. After this period the license can be renewed.

8. Licenses for radiotelegraphic stations for private use are limited to private correspondence between properties of the same licensee or between properties of two licensees, all correspondence with third persons being absolutely excluded. Such licenses are exempted from tax when the stations are constructed on private property and work over all the territory dividing the stations, without interruption by public land.

Licensees are also exempted from taxes which are granted for installation of radiotelegraphic and radiotelephonic stations having for object a scientific or educational purpose.

9. All applications for licenses for radiotelegraphic and radiotelephonic installations must contain:—

(a) The exact indication of the person or institution making the application and their legal residence.

(b) The nature and purpose for the license, the place or places where it is proposed to install the station or stations, and their presumed zone of service.

(c) The detailed plans for the construction and technical quality of the installation, indicating in a detailed manner the nature and power thereof.

(d) The period for which the license is asked.

(e) The period required before starting the station.

(f) The receipt of the amount to constitute the deposit-guarantee, as per Art. 13 and 14. Such a deposit must be paid to the cashier of the local Provincial Director of Posts and Telegraphs by the applicant for the license.

10. Every contract by the licensee, having for object the hire, amalgamation, partial or complete transference of the license or licenses, cannot take place before obtaining in advance the approval of the Government.

11. The license is considered as expired should the licensee fail to complete and have ready for service for radiotelegraphic or radiotelephonic installation within the time stipulated as per paragraph (e) Art. 9.

The license is considered as expired on the death of the licensee.

12. The officials of the State Telegraphic Administration shall be responsible for the maintenance of the installation and proper upkeep of the radiotelegraphic and radiotelephonic land stations for which a license is granted; they shall satisfy themselves that the licensee observes the law and the present regulations and that the licensee fulfils all the obligations imposed upon him by his contract with the Government.

13. Every licensee for a radiotelegraphic or radiotelephonic installation for private use, excepting the cases considered in Art. 8, will pay in advance to the State an annual fixed tax of £11.50.

To guarantee the said tax the licensee must make a deposit as guarantee equal to the amount of fixed tax for one year.

14. Every licensee for radiotelegraphic or radiotelephonic installations for public use will pay every year to the State in quarterly instalments a tax corresponding to 10 per cent. of the revenue from radiotelegraphic or radiotelephonic charges on the basis of the common tariff.

To guarantee the said tax the licensee will make a deposit as guarantee of not less than £1,200. If after one year the guarantee shows to be less than the amount due to the State for one year, then the deposit must be brought to the level of such proportion.

15. The period of the license and the obligation of the tax established by Arts. 13 and 14, begin from the month following the decree granting the license.

16. The deposits as per Arts. 13 and 14 will be forfeited to the public exchequer in case of withdrawal or termination of a license.

Should the licensee fail to provide for the payment of the taxes due as per Arts. 13 and 14, the Government will apply the deposit, which should be increased in its integral amount within ten days of the said confiscation.

SECTION 4.

17. *Qualifications for the Radiotelegraphic and Radiotelephonic Service.*—The staff necessary for the management and working of the radiotelegraphic and radiotelephonic service is appointed as follows:—

(a) For the stations under the control of the Ministry of Posts and Telegraphs, from amongst the officials of specialists of first, second, third and fourth class.

(b) For the stations under the control of the Ministry of War, amongst the officers and privates of the engineers of the R. Army.

(c) For the stations under the control of the Admiralty, from amongst the officers of the staff and the marines.

Should it at any time be found convenient to the management and working of the above-mentioned stations, a mixed staff selected from the three Administrations can be employed.

The Ministry of the Posts and Telegraphs can for an educational purpose always send its own staff to the radiotelegraphic and radiotelephonic commercial stations by making previous arrangements with the interested Administration.

18. The staff to be employed in the radiotelegraphic stations licensed to private persons must possess a certificate proving their professional ability.

Such a document is granted either by the Ministry of Posts and Telegraphs, or by the Admiralty, according to the service for which it is intended.

SECTION 5.

19. *Limitations to the use of Radiotelegraphic and Radiotelephonic Apparatus.*—Cargo and passenger vessels are prohibited from using their own radiotelegraphic or radiotelephonic stations when they are at anchor in the State waters, except in the case of giving warning of danger or appeals for help, or when they are about to sail, or for urgent reasons within half an hour after their arrival and when the communication with the land is cut off for special reasons or for sanitary measures.

A breach of this rule will render the transgressor liable to the penalties imposed by Art. 3 of the law.

SECTION 6.

20. *Taxes.*—The tax for one radiotelegram is composed:—

(a) Of the radiotelegraphic tax due to the coast station;

(b) Of the radiotelegraphic tax due to the station on board;

(c) Of the telegraphic tax.

For taxation purposes only those radiotelegrams exchanged with Ship stations are considered.

21. All the radiotelegraphic and radiotelephonic stations installed before the promulgation of the law must apply for a license within one calendar month of the present regulation.

The following paragraph relating to Wireless Telegraphy is taken from the "Law of June 30th, 1912," which contains regulations concerning marine, commercial and postal services:—

"The undertakers (of said services) are obliged to adopt on board their ships wireless telegraph and telephone apparatus, whose system and power will be indicated, and, if necessary, modified by the Ministry of the Navy."

The OFFICIAL STATUTE BOOK of the Kingdom of Italy contains the following decree, numbered 1587 and dated at Rome November 12th, 1916.

In pursuance of the law of May 22nd, 1915, No. 671, which confers extraordinary powers on His Majesty's Government and in pursuance of the law of June 3th, 1910, No. 395, and the relative regulations appertaining thereto, approval by Royal Decree of February 1st, 1912, No. 227, and in pursuance of the Royal Decree of July 11th, 1913, No. 1006, which gives effect to the International Radiotelegraphic Convention of London; and the Ministers in Council having given due consideration to the proposals placed before them by the Ministers of Maritime and Railway Transports and of Marine, in concert with the Minister of Posts and Telegraphs;

We have decreed and we hereby decree:—

ART. 1.—All vessels of commerce, whether propelled mechanically or by sails, whether they transport passengers or not, if they have on board a total of fifty persons or more, must, whilst at sea, carry an equipment of radiotelegraphic apparatus.

ART. 2.—From this obligation are exempted vessels on which the number of persons on board is exceptionally and accidentally increased to fifty or more, on account of *force majeure* or because the captain has been obliged to increase the number of his crew to make up for those who are ill, or on account of his having been obliged to transport persons picked up at sea or other persons.

There are also exempted from this obligation:—

(1) Vessels which during their voyage do not travel at a distance of more than 150 nautical miles from the nearest coast.

(2) Vessels on which the number of persons present on board is exceptionally or eventually increased to fifty or more, after embarkation, during a part of the voyage, of extra hands which it is found necessary to bring in for the handling of goods; on condition, however, that the aforementioned vessels do not perform trans-oceanic voyages and that, during the above-mentioned part of their voyage, they remain within thirty degrees latitude north and south.

(3) Sailing vessels of primitive construction whose build renders it impossible for them to be equipped with radiotelegraphic apparatus.

ART. 3.—Vessels, which by virtue of Art. 1 above-mentioned are required to be equipped with radiotelegraphic plant, are, as regards the Radiotelegraphic Service, divided in three classes, according to the classification of ship stations (prescribed by Article XIIIb) of the regulations annexed to the Radiotelegraphic Convention, signed in London on July 5th, 1912, viz:—

First Class.—Vessels possessing continuous wireless service. In this first class are included vessels able to carry on board twenty-five passengers or more:—

(i) If they have an average speed of fifteen knots or more.

(ii) If they have an average speed of over thirteen knots, but only on the double condition (a) that they have on board 200 persons or more (passengers and crew), and (b) that they perform, during their voyage, a journey of over 500 nautical miles between two consecutive ports of call. It is, however, allowable for these vessels to be included in the second class on condition that the listening-in service be continuous.

Second Class.—Vessels possessing a wireless service limited to certain hours.

In the second class are included vessels able to carry on board twenty-five passengers or more, if they are not, for other reasons, included in the first class.

Vessels of the second class must, whilst at sea, keep a permanent listening-in service of at least seven hours per day, and must, in addition, listen-in for ten minutes at the beginning of each of the remaining hours.

Third Class.—Vessels possessing a wireless service with no fixed hours of working.

In the third class are included all vessels which are not included in the first or second classes.

The owner of a vessel included in the second or third class has the right to demand that, in the certificate which is issued to him, the vessel in question be allocated to a superior class, if the said vessel satisfies all the requirements of that class.

ART. 4.—Vessels, which by the terms of Article 1 (above) must be equipped with radiotelegraphic plant shall be required to maintain whilst at sea a continuous listening-in service, if the Government shall judge that it is useful for the safety of life at sea.

In any case a continuous watch is required by:—

1. Vessels which possess an average speed of over thirteen knots; which have on board 200 persons or more; and which perform during their voyage journeys of over 500 nautical miles between two consecutive ports of call, even when those vessels are classified in the second class.

2. Vessels of the second class, during the whole time when they are voyaging over 500 nautical miles distant from the nearest coast.

3. Other vessels indicated in Article 1 when they are in the trans-Atlantic service; or, whilst in other services, when their itinerary requires them to go over 1,000 nautical miles from the nearest coast.

Vessels used for all kinds of fishing purposes, including whalers which are required to be equipped with radiotelegraphic plant, are not obliged to maintain continuous listening service.

The continuous listening service can be performed by one or more telegraphists holding one of the certificates prescribed in Article X of the regulations annexed to the International Radiotelegraphic Convention of 1912, and also, if necessary, by one or more qualified listeners (*ascoltatori patentati*).

Nevertheless, should a reliable automatic alarm apparatus be invented, the continuous listening service may be maintained by means of that apparatus, after its use has been duly authorised by the Ministry of Maritime and Railway Transports.

By the term duly qualified listener (*ascoltatore brevettato*) shall be understood a person holding a certificate of competency issued by an administrative authority established for the purpose. To obtain such a certificate, the applicant shall be required to prove that he is competent to receive and to understand the radiotelegraphic distress signal and safety signal.

The registered owner shall take the necessary steps to provide that secrecy with regard to communications shall be respected by the qualified listeners in his employ.

ART. 5.—The Radiotelegraphic apparatus obligatory fitted in accordance with Article 1 must be able to transmit, by day, from vessel to vessel, signals clearly perceptible under normal circumstances and conditions, at a minimum distance of 100 nautical miles.

Every vessel obliged, under the terms of Article 1 above mentioned, to be equipped with radiotelegraphic apparatus (in whatever category it may be classed), be fitted in conformity with Article XI of the regulations annexed to the International Radiotelegraphic Convention of 1912, with an auxiliary radiotelegraphic apparatus, every part of which shall be kept in a location as absolutely secure as possible.

In any case, the auxiliary apparatus must be entirely situated in the upper parts of the vessel, as high up as may be found practicable.

The auxiliary apparatus shall, as provided in Article XI of the regulations annexed to the International Radiotelegraphic Convention of 1912, possess a source of power devoted to that purpose alone. The apparatus must be capable of being speedily adjusted and employed besides being able to be worked for at least six hours, with a minimum range of eighty nautical miles for vessels of the first class, and of fifty nautical miles for vessels of the other two classes.

If the normal apparatus, the range of which under the terms of this Article covers at least 100 nautical miles, satisfies all the conditions indicated above, there is no obligation to carry also an auxiliary apparatus.

ART. 6.—Every installation must, after the owner has sent in his request, and before it starts working, be inspected and approved by the competent authorities; the Certificate of Inspection, which constitutes a working license in accordance with Article IX of the regulations annexed to the Radiotelegraphic Convention of 1912, shall contain details of the apparatus as far as they relate to the terms of the concession; it shall be drawn up in duplicate, and one copy thereof shall be handed to the commander of the vessel; but the copy shall not be thus issued if the apparatus does not comply with the conditions laid down in the Radiotelegraphic Convention of 1912 and in the present decree.

ART. 7.—Every captain of a vessel who receives a distress call from a vessel in danger is obliged to go to the help of those in danger.

The captain of every vessel in danger has the right to select from those vessels which have answered his call that vessel or vessels which he considers to be the most capable of affording him help. He should only avail himself of such right after having consulted, as far as possible, the captains of the vessels themselves. The latter are obliged to comply immediately with such request, going with all speed to the help of those in danger.

The captains of the vessels upon whom devolve the duty of rendering assistance are released from their obligations as soon as the captain or captains requisitioned have made known that they are ready to obey the requisition; or as soon as the captain of one of the vessels which has reached the scene of the catastrophe shall have made known to them that their help is no longer necessary.

If the captain of a vessel finds it impossible, or does not consider it reasonable or necessary under the special circumstances of the case, to go to the help of the vessel in danger, he immediately informs the captain of the latter. He must also enter in his log the full reasons prompting his decision.

ART. 8.—With regard to the terms of Article 1, shipowners or their representatives shall, within fifteen days of the publication of the present decree, make application to the Ministry of Posts and Telegraphs for any concession required for existing vessels (in accordance with Article 1) not already equipped with radiotelegraphy and not excused from the installation of such apparatus under the provisions of Article 2.

When it is desired to nationalise any vessels after the date of the present decree, and such vessels come within the scope of the conditions laid down in Article 1, neither the necessary nationalisation papers nor any provisional certificate will be issued unless the shipowner shows that he has made the proper application for a licence to install radiotelegraphic apparatus on board.

Existing licenses, notwithstanding the provisions of Article 7 of the regulations regarding radiotelegraphy at present in force, shall remain valid throughout the duration of the war. On their expiry the shipowner shall make application for a renewal in accordance with the Article above-mentioned; moreover it is further incumbent upon the shipowner to continue to work the ship station until the new license has been obtained.

On the official license there shall be entered a date on which each ship installation must be ready to work, this date will be estimated on the importance of the services for which the vessel is destined, and in accordance with the opinion of the competent authorities.

For vessels which had a radiotelegraphic station, but which did not have the auxiliary apparatus required under the above-mentioned regulations, there is granted a period of one year from the date of the present decree to put the matter in order.

ART. 9.—Vessels whose owners shall not have made application for a radiotelegraphic license within the period fixed by Article 8; or those whose owners, having obtained their licence, have nevertheless neglected to put the station in working order, either in accord with the above-mentioned provision, or in accord with the term-limit inserted in the license itself, may be refused the right of working cargoes.

Whenever vessels which have not complied with their obligation to instal radiotelegraphic apparatus are obliged to put to sea either because they have public services to fulfil, or for any reason of national importance, the Minister of Transports shall have the power to issue official instruction that the station shall be installed and put in working order at the expense of the owner of the vessel.

The same power is granted to the Minister of Transports in cases where the vessels referred to in Article 1 navigate waters outside the limits set forth in Article 2.

The expenses incurred for such official installation of apparatus and for the putting in working order of the same shall be recoverable in the manner indicated in Art. 205 of the laws governing the Mercantile Marine.

TEMPORARY PROVISIONS.

ART. 10.—It is therefore hereby rendered obligatory for the period of the war (and in any case, for not less than three years from the date of the license) that all mechanically propelled mercantile vessels (of a gross tonnage of 2,000 tons or more in the case of cargo ships and of 1,500 tons or more in the case of passenger vessels) shall install and maintain radiotelegraph stations in accordance with the existing laws and regulations, even though they are not compelled to apply for a radiotelegraph license in accordance with Article 1.

ART. 11.—At the discretion of the Minister of Transports and following upon a request of the owners of the vessel, those vessels which perform voyages between ports of the Kingdom, excluding the Colonies, and which do not go beyond twenty miles from the coast, may be relieved of the obligation set forth in the preceding Article.

ART. 12.—The regulations contained in Articles 3 and 9 are intended to apply also to those Articles alluded to in these temporary provisions, except as regards the duration of the concession and the obligation to apply for its renewal. However, in the case of these vessels a special auxiliary plant is not indispensable and it will be sufficient if the range of the station does not fall below eighty nautical miles, and that it is possible for regular transmission to be carried out at any moment.

ART. 13.—The Commission for Insurance against war risks at sea, sitting at the "National Insurance Institute," in determining the premiums in respect of vessels, shall take into account the existence on board of radiotelegraph apparatus, whether temporary or permanent, in accordance with these temporary provisions.

ART. 14.—In order to insure the working of the radiotelegraphic service on mercantile vessels, operators not indispensable for the Royal Army and for the Royal Navy, will be exempted from military service at the request of the Ministry of Maritime and Railway Transports.

ART. 15.—The present decree takes effect from the day of its publication in the *Official Gazette* of the Kingdom of Italy.

We order that the present decree, stamped with the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, ordering that everyone whom it concerns may observe it or cause it to be observed.

Dated Rome, November 12th, 1916.

Royal Decree No. 2223.

VITTORIO EMANUELE III.

E By the grace of God and the will of the Nation, King of Italy.

Having seen the law of 30th June, 1910, No. 395, and the relative regulations approved by Royal Decree 1st February, 1912, No. 227;

Having seen the Royal Decree No. 1002 of 11th July, 1913, ratifying the International Radiotelegraphic Convention of London, 1912, and the acts thereto annexed;

Having seen the Royal Decree of 28th December, 1913, No. 1480, which extends to the radiotelegraph service in the Italian Kingdom the provisions of the above-mentioned Convention of London;

Having recognised the necessity of establishing—in harmony with the provisions of Article X of the Service Regulations annexed to the aforementioned Convention of London—opportune regulations for the issue of Government certificates to radiotelegraphists desirous of performing radiotelegraph service on board mercantile vessels;

On the proposal of the Minister Secretary of State for the Navy, in agreement with the Minister of Posts and Telegraphs;

We have decreed and we decree:

ART. 1.—Certificates of competency to perform radiotelegraphic service on board commercial vessels, as contemplated in Article X of the Service Regulations annexed to the International Radiotelegraph Convention of London, will be issued by the School of Semaphorists and Radiotelegraphists of the Royal Navy at Spezia (Comando difesa militare) marittima.

2. At the aforementioned school shall be instituted and maintained up to date a general register of all the candidates examined, with particulars of the examination undergone by each candidate, and the result. The school shall also preserve in its archives a copy of the photograph of each candidate, furnished with all the particulars entered in the general register and also a personal description of the candidate.

The Ministry of Marine shall be empowered to authorise, when circumstances require and merely as an exceptional case, that candidates shall be examined at other branches of the Royal Navy, but the examination must always be conducted under the supervision of the officials of the Royal School of Semaphorists and Radiotelegraphists.

ART. 2.—Candidates shall be examined by a suitable commission composed of:

The Director of the aforementioned School or a superior officer of the Staff of the Royal Navy.

Two officers or officials of the Royal Navy who are specialists in radiotelegraphy.

The commission will assemble in the early days of each month.

ART. 3.—Candidates, in order to be admitted to the examinations, shall forward, in due time, an application on stamped paper to the value of two lire addressed to the "Direzione della regia scuola semaforisti e radiotelegrafisti Spezia," and such application must be accompanied by the following documents:

Certificate of study (not less than the "licenza elementare").

Authentic copy of birth certificate proving that the applicant has completed his eighteenth year but is not more than thirty years of age;

"Certificato di penaltà" (police certificate of good conduct), the date of which must not be more than two months prior to the date of presentation of such document;

Certificate of good conduct and personal character issued by the Mayor of the Commune in which the applicant is resident, bearing the visé of the Prefect or Sub-Prefect;

Any certificates testifying to the applicant's knowledge of radiotelegraphy and foreign languages;

Certificate of Italian citizenship;

Certificate of entry in the lists of the military or naval levies and the certificate of service performed;

Two photographs;

Postal order for L.2.05, the fee for the certificate of radiotelegraphy. (This amount will be refunded to candidates failing to pass the examination.)

The candidate shall declare in the application whether he has undergone previous examination, and if so the date and place of such examination.

N.B.—A man presenting the certificate of "esito di leva" or the extract of the "matricola della gente di mare" will not be required to present a certificate of Italian citizenship.

All documents shall be presented on paper stamped to the prescribed amount, unless the applicant is able to show, by authentic document, that he is in a state of poverty. The application, however, must always be written on stamped paper.

ART. 4.—Applicants who are admitted to the examinations after having presented the prescribed application duly documented will be notified by the School authorities as to the day on which they are to present themselves to undergo the test.

ART. 5.—The Examining Commission shall rigorously satisfy itself that the candidate fulfils the conditions prescribed in the aforementioned Article X of the Regulations—namely, that he possesses a perfect knowledge of the radiotelegraph apparatus as shall enable him to render efficient radiotelegraph service on board ship.

Candidates must possess the knowledge of radiotelegraphy stipulated in Appendix A (programme of examination for the granting of Government radiotelegraph certificates), signed, on Our order, by the Minister of Marine.

ART. 6.—In addition to the above-mentioned tests candidates must undergo practical tests in transmission and oral reception, the duration of such tests to be not less than ten minutes.

In connection with the provisions of Article X of the Regulations of Service annexed to the International Radiotelegraph Convention of London, shall be issued:

A first-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twenty words per minute in a foreign language;

A second-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twelve and not exceeding nineteen words per minute in a foreign language. An average of five characters per word shall be taken as a basis for calculation.

ART. 7.—The aforementioned certificate shall be designated "Brevetto internazionale di radiotelegrafista" and shall bear the photograph of the holder, duly legalised by the stamp of the authority of the Royal Navy, and the personal description of the holder and the qualifications attained.

ART. 8.—Applicants who have been declared by the Examining Commission to be unqualified to receive the International Radiotelegraph Certificate cannot present themselves for further examination if at least six months have not elapsed from the date of the first examination.

ART. 9.—Radiotelegraphists who have obtained a second-class certificate in radiotelegraphy shall only undergo the examination to obtain a first-class certificate after three months have elapsed from the date of the last examination.

ART. 10.—Candidates who have been found unqualified after two consecutive examinations cannot undergo a further test without the special and exceptional authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 11.—The issue of duplicate international certificates in radiotelegraphy is forbidden without the special authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 12.—Radiotelegraphists must undertake to maintain the secrecy of correspondence.

ART. 13.—All violations of the secrecy of correspondence, of the International Radiotelegraph Convention and the relative regulations, and of the general rules governing the working of radiotelegraph stations open to public service will be punished by the temporary or permanent withdrawal of the radiotelegraphist's certificate, according to the seriousness of the infraction committed by the radiotelegraphist, irrespective of any more severe punishment that may be imposed.

ART. 14.—The present decree will enter into force from the day of its publication in the *Gazzetta ufficiale*.

We order that the present decree, to which has been affixed the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, and we enjoin its observance upon all those whom it may concern.

Given this day, November 4, 1919, at San Rossore.

VITTORIO EMANUELE,
Sechi-Chimienti.

Seen, The Keeper of the Seals :
Mortara.

APPENDIX A.

PROGRAMME OF EXAMINATIONS FOR THE GRANTING OF GOVERNMENT CERTIFICATES IN RADIOTELEGRAPHY.

Diagram of the various radiotelegraph apparatus used and the working of the individual parts.

A perfect knowledge of such apparatus, its adjustment and method of removing faults.

Tuning of a station. Rules relative thereto. Cimoscopi (?)

Receiving apparatus and the mode of using them.

Sources of energy which feed radiotelegraph apparatus: Dynamos, alternators, transformers, converter groups and converters. Accumulators and their maintenance.

Measures necessary in the practice (working) of radiotelegraphy. Voltmeters, ammeter, methods of insulation.

Antennæ and earth.

Precautions to avoid damage to the material and staff during transmission.

Protection devices of the oscillatory circuits.

Perfect knowledge of the general working rules of radiotelegraph stations open to public service, and also of the International Radiotelegraph Convention and the Service Regulations annexed thereto.

Perfect knowledge of the conventional abbreviations.

Knowledge of foreign languages (optional).

Duties of the radiotelegraphist as regards the radiotelegraph service.

Secrecy of correspondence.

Rome, 4th November, 1919.

Seen, by order of His Majesty the King,
SECHI,
Minister of Marine.

THE MINISTERIAL SECRETARIES OF STATE FOR THE MARINE AND POSTS AND TELEGRAPHS.

F In view of the statute of the 30th June, 1910, No. 305 on Radiotelegraphy and Radiotelephony and the Regulation relating, approved by Royal Decree of the 1st February, 1912, No. 227;

In view of Royal Decree of 11th July, 1913, No. 1006 which ratifies the 1912 International Radiotelegraph Convention of London and the acts added to it;

In view of Royal Decree No. 1480 of the 28th December, 1913, extending the provisions of the said Convention to the Radiotelegraphic Service of the kingdom;

In view of the Ministerial Decree No. 1537 of the 12th November, 1916, and the Royal Decree Law No. 1786 of 5th December, 1920, which makes it obligatory for any category of merchant ships to have radiotelegraphic installations on board;

The necessity being recognised that control on private radiotelegraphic correspondence accepted on board ships should be exercised with the due guarantee;

IT IS DECREED :

ARTICLE 1.—In accordance with the provisions of Article X, Clause 4 of the Regulation annexed to the 1912 International Radiotelegraph Convention of London, the radiotelegraphic service of every ship station is placed under the supreme control of the commander of the boat who shall exercise the requisite control over all correspondence.

ARTICLE 2.—No radiotelegraphic correspondence can be transmitted or delivered by the ship station unless passed by the commander of the ship.

Rome May 23rd, 1921.

The Ministers,

Signed.....

Signed.....

JAMAICA

(See under BRITISH WEST INDIES),

JAPAN

(See also Map Section)

Including : Hokoto (Pescadores), Sakhaluin (Karafuto), Kwantung, Formosa, Korea, Kiau-Chaw.

THE Japanese claim that their empire was founded in 660 B.C., and that the dynasty of its foundation still reigns. The present Emperor is Yoshihito (Harunomia), who retains the rights of sovereign, and is assisted by a Cabinet and Privy Council.

The area of the islands and mainland is 260,738 square miles with a population of 55,961,140.

CONTROL.

The Department of Communications controls all Government stations and inspects all private stations in Japan. These are divided as follows:—

Government Land Stations	..	..	..	..	9
Private Land Stations	..	..	..	..	6
Government Ship Stations	..	..	..	..	45
Private Ship Stations	..	..	..	..	248

Besides these stations there are five Government stations, under the jurisdiction of the Government-General of Korea and Kuantung, all open for public communication. In addition, there are many Navy and Army stations under the control of the Navy and Army Departments.

Wireless work in the Department of Communications is divided into two sections: (a) The Research Laboratory, and (b) the Installation and Inspecting Section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. Narakichi Yoneda	Director-General of Posts and Telegraphs	Tokyo
Mr. Utaro Noda ..	Minister of Communications	Tokyo
Mr. Toyosuke Hada ..	Vice-Minister of Communications	Tokyo

WIRELESS RESEARCH LABORATORY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Dr. W. Torikata ..	Director of Electro-technical Laboratory.	—
Mr. E. Yokoyama ..	Chief of Wireless Research Laboratory.	1, Kihara-machi Omori near Tokyo
Mr. K. Kitamura ..	Wireless Engineer ..	702, Nakashibuya, suburb Tokyo
Mr. E. Takagishi ..	Assistant Wireless Engineer..	517, Pishi-okubo, suburb Tokyo
Mr. K. Echizen ..	Assistant Wireless Engineer..	2737, Arai-mura, Ebara-gun, Tokyo pre- fecture
Mr. R. Shizume ..	Assistant Wireless Engineer..	5, Shiba Park, Tokyo
Mr. J. Doki ..	Assistant Wireless Engineer..	Hiraiso Electric Laboratory Branch, Hiraiso- machi, Naka-gun, Ibaragi prefecture
Mr. K. Kusama ..	Assistant Wireless Engineer..	297, Jagakubo, Hirazuka-mura, Ebara-gun, Tokyo prefecture
Mr. Kagao ..	Assistant Wireless Engineer..	27, Morimoto-cho, Itchome, Azabu, Tokyo
Mr. K. Ito ..	Assistant Wireless Engineer..	62, Nagata-cho, Nichome Kojimachi-ky Tokyo
Mr. S. Yoshida ..	Assistant Wireless Engineer..	47, Kashuagi, Yodobashi, near Tokyo

WIRELESS INSTALLATION AND INSPECTING SECTION.

<i>Official.</i>	<i>Title.</i>
Mr. M. Saeki ..	Chief of Wireless Installation and Inspection
Mr. T. Nakagami ..	Wireless Engineer
Mr. Y. Yoshida ..	Assistant Wireless Engineer
Mr. N. Wakamatsu ..	Assistant Wireless Engineer
Mr. U. Koyama ..	Assistant Wireless Engineer

ORGANISATION.

The first wireless experiment in Japan was carried on, in 1896, according to the conduction method, and electric-wave telegraphy has formed a subject of Japanese research since 1897, its practical utility being first sufficiently proved by the experience of the Japanese Navy in the Russo-Japanese War. The first commercial wireless station was erected in May, 1908, at Choshi, about 80 miles east of Tokyo. Since that time the number of stations have been largely increased.

There are two leading companies manufacturing wireless apparatus in Japan—the Annaka Electric Manufacturing Co. and Nippon Radio Telegraphy and Telephony Co., Ltd.

Wavelength augmenting apparatus has been jointly invented by Dr. Yamamoto and Professor Kawaharada, of Waseda University, and a wireless signalling appliance, invented by Dr. Mune and Engineers Fujinuki and Itabashi, of the Tokyo Electric Co., have generally affected the wireless field in the world. The invention made by Dr. Torigata for connections between wire and wireless telephones having undergone various experiments has reached the stage of its practical use. Study on high frequency generators in the Navy has also shown a marked progress.

A large wireless station is now working in Formosa constructed by the Japanese Navy with materials produced in Japan. It was opened for service early in 1920.

The stations of Fukuoka and Fusan are being equipped for wireless telephony for communication across the Chosen Strait. This forms part of the Government plan for linking up the various islands of the Empire by Wireless.

Several new stations are under construction, and wireless services between Japan and America and Hawaii will soon be in operation *via* the new Iwaki station. The receiving station is at Tomioka, and was opened on May 1st, 1920, and the transmitting station is at Haranomachi, not yet completed.

The Fisheries and each Meteorological Observatory are being installed with wireless, and a new station in Osaka will soon be opened for press services with Europe and America.

The Japanese Government has also decided to erect wireless stations on all the islands along the coast.

A new telegraph training school has been erected at Meguro, a suburb of Tokyo, at a cost of 300,000 yen, and has been specially adapted for the training of radiotelegraph operators.

A fortnightly magazine devoted to the study of wireless telegraphy and telephony, and a monthly magazine named *Musen-no-Nippon*, or *Wireless Press*, are published by the Wireless Press Agency.

ADMINISTRATION.

The first wireless regulations in Japan were promulgated in April, 1908, under the Telegraph Law of 1900. A number of additions and modifications have since been made of these regulations, and these are now incorporated in the Wireless Telegraph Law, which was promulgated and took effect in 1915. The texts of these laws and regulations now in force are shown in the following pages in accordance with the list below :—

A—Wireless Telegraph Law No. 26.

B—Wireless Telegraph Regulations No. 16 (Japanese reference No. 41-48).

D—Foreign Wireless Telegraph Regulations.

C—Regulations relating to Private Wireless Telegraphs.

E—Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

F—Regulations regarding the qualifications of wireless operators:—

- (i) Substitution of Foreign Operators.
- (ii) Qualification of Wireless Operators on Fishing Trawlers.
- (iii) Amendment to the Regulations regarding qualifying examination for Operation of private Wireless Telegraphs.

WIRELESS TELEGRAPH LAW.

(Law No. 26, June 19th, 1915.)

ART. 1.—All wireless telegraphs and telephones shall be under the control of the Government.

ART. 2.—Wireless telegraphs and telephones referred to below may be privately established with the permission of the responsible Minister, to be determined by an Order.

(i) Installations on board vessels with the object of assuring safety to navigation.

(ii) Installations on board vessels for communication between vessels engaged in a specific business belonging to one person, with the object of facilitating such business.

(iii) Installations on board vessels or on land for the exclusive use of private persons and communicating with telegraph offices for the dispatch and receipt of telegrams, but disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications.

(iv) Installations on board vessels or on land with the object of facilitating a specific business belonging to one person by mutual communication on land or between land and vessel, disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications, but to which the preceding clause is not applicable.

(v) Installations with the exclusive object of carrying out experiments in connection with wireless telegraphy or telephony.

(vi) Installations recognised as necessary by the responsible Minister, but not coming within the purview of the preceding clauses.

ART. 3.—Restrictions relating to private wireless telegraph and telephone apparatus, their installation and employment, together with the qualifications of persons operating private wireless telegraphs, will be determined by an Order.

ART. 4.—Private wireless telegraphs and telephones must not be used for purposes other than those for which they were established. Provided that their use shall not be prevented for signals of distress at sea, meteorological reports, time signals and in other cases, to be determined by an Order, where public utility is recognised by the responsible Minister.

ART. 5.—Wireless telegraphs and telephones installed on foreign ships may only be used in accordance with the provisions of Article 2. Provided that their use shall not be prevented for Signals of Distress at sea and for communications with telegraph and telephone offices whilst on voyage.

ART. 6.—The responsible Minister may, by the issue of an Order, cause private wireless telegraphs or telephones to be used for the public service or for communications necessary for military purposes.

In cases coming within the purview of this Article the responsible Minister may, where deemed necessary, send officials to carry out the required operation.

ART. 7.—Where the responsible Minister deems it necessary in the interests of the public communications or on military grounds, he

may withdraw his sanction from private wireless telegraphs or telephones or order changes in their equipment.

ART. 8.—Where the responsible Minister deems it necessary for the sake of public security, he may order a restriction of or suspension in the working of or the removal of instruments and accessories belonging to private wireless telegraphs or telephones or wireless telegraphs or telephones installed on foreign vessels.

In cases coming within the purview of this Article, the responsible Minister may, where deemed necessary, send competent officials to seal up instruments and accessories or to effect their removal.

ART. 9.—Where persons responsible for private wireless telegraphs or telephones have contravened this Law, Orders based on this Law, or provisions arising therefrom, the responsible Minister may withdraw his sanction from such wireless telegraphs or telephones or order the suspension of their operations.

ART. 10.—Where sanction has been withdrawn from wireless telegraphs or telephones established by private persons the dismantling of their apparatus and mountings will be required by order of the responsible Minister. This applies also in the case where private wireless telegraphs or telephones have ceased operations.

ART. 11.—Where private wireless telegraphs or telephones or wireless telegraphs or telephones established on foreign vessels have been called upon to deal with signals of distress at sea, such service must not be refused.

ART. 12.—Immediately on receipt of signals of distress at sea, wireless telegraphs or telephones shall acknowledge them and report to the wireless telegraph or telephone most conveniently situated for purposes of rescue.

In cases coming within the purview of this Article, where request has been made for communication on specific matters, such communication should immediately be made regardless of the provisions of this Article.

ART. 13.—Where the responsible Minister has ascertained that any person has illegally set up a wireless telegraph or telephone, he may appoint competent officials to enter such establishment, inspect the apparatus and mountings thereof, effect the removal of instruments and accessories, and take other steps appropriate to the circumstances.

ART. 14.—The Government may, for the purpose of establishing wireless telegraphs or telephones to meet the needs of public communications, require the use of part of a vessel, and in case of necessity order special provision and equipment. Under the provisions of this Article a suitable rent for accommodation and actual cost of special provision and equipment will be paid by the Government on application.

ART. 15.—Matters relating to the administration of wireless telegraphs, wireless telephones, telegraphs, telephones, mails, postal money orders and post office savings, or signals of distress at sea, time signals and meteorological reports may as determined by an Order be communicated free of charge by the wireless telegraphs or telephones provided for the public service.

ART. 16.—Persons who have set up wireless telegraphs or telephones without permission, or have made use of wireless telegraphs or telephones set up without permission, or those who have made use of private wireless telegraphs or telephones after permission has been withdrawn will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

ART. 17.—Persons using private wireless telegraphs or telephones for purposes other than those for which they were established will be subject to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

Persons applying to and having messages sent by private wireless telegraphs or telephones will be subject to a fine not exceeding one hundred yen.

ART. 18.—Persons contravening the provisions of Article 5 or disobeying Orders based on this Law for restricting or suspending the use, changing the equipment of or removing or dismantling wireless telegraphs or telephones will be subject to a fine not exceeding one thousand yen. Where persons engaged in the business of wireless telegraphs or telephones have used them in opposition to Orders for their restriction or suspension, this provision shall apply also to such persons.

ART. 19.—Persons refusing without just cause to furnish the use of wireless telegraphs or telephones under the provisions of Article 6 or of vessels or failing to make special provision or equipment under the provisions of Article 14, will be subject to a fine not exceeding one thousand yen.

ART. 20.—Persons violating the secrecy of wireless telegraph or telephone messages coming under treatment at telegraph or telephone offices will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have divulged the secrets of messages under the provisions of this Article they will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

The offences dealt with in this Article must be established by prosecution.

ART. 21.—Persons illegally evading charges connected with wireless telegraphs or telephone or causing other persons to evade them will be subject to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have committed acts referred to in the preceding paragraph, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding five hundred yen.

ART. 22.—Persons dispatching false communications by wireless telegraph or telephone with the object of causing harm to other persons will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

Persons dispatching false communications by wireless telegraph or telephone with the object of adversely affecting the public welfare will be subject to penal servitude for a period not exceeding five years or to a fine not exceeding one thousand yen.

Persons dispatching by wireless telegraph or telephone reports of shipping casualties when there are in fact no shipping casualties will be subject to imprisonment with hard labour for a period of not less than three months and not exceeding ten years.

Persons engaged in the business of wireless telegraphs or telephones who have committed acts referred to in the first clause will be subject to imprisonment with hard labour for a period not exceeding five years or a fine not exceeding one thousand yen; in the second clause to penal servitude for a period not exceeding ten years; in the third clause to a term of imprisonment with hard labour of not less than one year.

ART. 23.—Where persons engaged in the business of wireless telegraphs have without just cause opened, damaged, concealed or thrown away telegrams sent by wireless telegraphy and coming under treatment at telegraph offices, or have delivered them to persons other than their proper recipients, they will be subject to penal servitude for a period not exceeding three years or to a fine not exceeding five hundred yen. Provided that cases coming within the purview of Articles 258 and 259 of the Criminal Code shall be dealt with according to that Code.

ART. 24.—Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, neglected to deal with general public telegrams or communications necessary for military purposes, or have caused them to be delayed, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, failed to deal with reports of distress to vessels under the provisions of Articles 11 or 12, or have caused them to be delayed, they will be subject to a term of imprisonment with hard labour of not less than one year.

Persons obstructing communication of reports of distress at sea will similarly be dealt with under the preceding clause.

ART. 25.—Persons obstructing, or committing acts calculated to obstruct, general public communications or communications necessary for military purposes sent by wireless telegraph or telephone will be subject to penal servitude for a period not exceeding seven years or a fine not exceeding five hundred yen.

ART. 26.—Unconsummated attempts to contravene the provisions of the last ten Articles are punishable.

ART. 27.—Persons opposing, hampering or avoiding the competent officials appointed under this Law in the execution of their duty or failing to answer their questions or making false statements during the inspection required

under the provisions of Article 13 will be subject to a penalty not exceeding one hundred yen.

ART. 28.—The provisions of the Telegraph Law, Articles 4, 5, 11 to 21, 23, 24 and 45 apply to wireless telegraphs and telephones employed for the general public service and communications necessary for military purposes.

SUPPLEMENTARY REGULATIONS.—The date of coming into force of this Law will be fixed by Imperial Ordinance.

The above Wireless Telegraph Law came into force on November 1st, 1915. Imperial Ordinance No. 186, October 25th, 1915

WIRELESS TELEGRAPH REGULATIONS, No. 16.

DATED APRIL 8TH, 1908.

B ART. 1.—The expression "wireless telegram" means any telegram to be transmitted by wireless telegraphy.

ART. 2.—In the present Regulations the term "coast station" means any telegraph office on land equipped with wireless telegraph apparatus, and the term "ship station" means any telegraph office on board a ship equipped with wireless telegraph apparatus.

ART. 3.—Wireless telegrams shall bear the following abbreviated instruction:—

"RA" in the case of Romanised telegrams.

ART. 4.—The name of a coast station through which a wireless telegram destined for a ship station is to be transmitted shall be indicated within parentheses in the address of the telegram, but such indication shall not be counted in the number of words even in the case of a Romanised telegram.

In case such coast station cannot transmit the telegram, but there is another coast station which is able to do so, the intermediary of the latter may be resorted to. If a telegram destined for a ship can be delivered direct to the addressee from a telegraph office on land, it may be delivered from such office without the use of wireless telegraphy.

(a) Wireless telegrams to be transmitted by way of intermediate ship station, with the exception of those handed in at a ship station, shall bear the following abbreviated instruction:—

"RS" in the case of Romanised telegrams.

Such intermediary transmission can in no circumstances be made more than once.

ART. 5.—If the sender of a wireless telegram destined for a ship station wishes to indicate the term during which his telegram is to be kept at the coast station, the number of days shall be inserted in the telegram as paid instruction.

Wireless telegrams without such instruction will be retained at the coast station for nine days from the day of handing in. However, in case the transmission of a telegram cannot be effected on account of the ship's station leaving out of the radius of action of the coast station or for any other reasons, the telegram may not be retained, if the retention is deemed unnecessary.

ART. 6.—If the sender wishes to prolong the term of retention mentioned in Art. 5, application to that effect shall be made to the coast station before the expiration of the term. The same applies to further prolongation of the term. In such case, the term of retention will be nine days, unless specially indicated.

The application shall contain the date of handing in, number of characters or words, and the names of the sender and addressee of the wireless telegram.

The sender may make the application mentioned in paragraph 1 through the office of origin. If he wishes it notified to the coast station by telegraph, he shall pay the charge for a paid service telegram for the purpose.

ART. 7.—The transmission of a wireless telegram is to be effected when both the sending and receiving offices are within the guaranteed range of action of each other.

ART. 8.—In the case of ships' distress, wireless telegrams informing the name of the ship in distress the location and condition of the doomed vessel and any other particulars necessary for rescue, shall be treated by coast or ship stations with absolute priority suspending all other communications.

ART. 9.—Paid service telegrams concerning enquiry, rectification, and stoppage of a wireless telegram to which reply is required can be exchanged only between telegraph offices on land.

ART. 10.—"Urgent telegrams," "redirected telegrams," and "telegrams with acknowledgment of receipt" are admissible between telegraph offices on land.

The sender of a wireless telegram with acknowledgment of receipt will be notified of the date and time at which the coast station has transmitted the telegram to the ship station.

(a) Telegrams of the same text originating from the same ship station or from the same telegraph office on land, and passing through the same coast station, may be made a multiple telegram, so far as concerns the transmission between wireless telegraph stations or between telegraph offices on land, as the case may be, no matter whether the addresses of such telegrams be in different localities or they be served by different offices of destination. The telegram shall bear the following abbreviated instruction instead of that for an ordinary multiple telegram:

"SM" in the case of Romanised telegrams.

Paragraph 2 of Article 4 is not applicable to the multiple telegram mentioned in the preceding paragraph when it is to be distributed to two or more ship stations, unless every copy of such telegram can be transmitted through the same coast station or delivered from the same telegraph office on land.

(b) Reply-paid wireless telegrams shall bear the abbreviated instruction for "reply paid," "urgent reply paid," or "collected reply paid," completed by the mention of the prepaid amount. If a prepaid amount is 60 sen in the case of *kana* telegrams, and 75 sen in the case of Romanised telegrams, the mention of the amount is not required.

ART. 11.—Wireless telegrams are subject to the following charge for the operation at a coast station or a ship station in addition to the ordinary telegraph charge. It is provided, however, that the ordinary telegraph charge is not levied on a telegram which is to be transmitted only by wireless telegraphy.

For Government and Ordinary Telegrams:

Coast Charge.—For a *kana* telegram, 20 sen up to fifteen characters; 5 sen for every additional five characters or less. For a Romanised telegram, 25 sen up to five words; 5 sen for every additional word.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charges.—20 sen for every fifty characters or fraction thereof.

Ship Charge.—Ditto.

(a) The following charge is levied in the same way as mentioned in the preceding Article on a supplementary copy of a multiple wireless telegram.

For Government and Ordinary Telegrams :

Coast Charge.—For a kana telegram, 10 sen ; for a Romanised telegram, 15 sen.

Ship Charge.—Ditto.

For Press Telegrams :

Coast Charge.—One-half the charge for the original telegram.

Ship Charge.—Ditto.

(b) If, in the case where Paragraph 2 of Article 4 is applied, the amount paid fall insufficient, the deficiency is collected from the addressee. In the case of a multiple telegram the amount to be collected is divided by the number of copies, and the quotient shall be the sum collected from one addressee.

ART. 12.—Wireless telegrams are free from special charge applicable to telegrams handed out of the ordinary hours of duty.

ART. 13.—The following charges for a wireless telegram shall be refunded less the amount which had been appropriated for another charge :—

(1) The charges pertaining to the transmission by wireless telegraphy when not effected.

(2) The charges pertaining to the transmission on telegraph lines when not effected.

ART. 14.—An application for the refund of charges for a wireless telegram handed in at a ship station may be sent in through any telegraph office.

ART. 15.—The term of retention mentioned in Articles 5 and 6 is not reckoned in the period of delay giving rise to refunds.

ART. 16.—Matters not expressly provided for in this Ordinance are subject to the other regulations relating to inland telegrams. Provided that the Regulations relating to Telegrams, Articles 71, 114, 121, 126 to 130, 146 to 148, 148 (vi) to 148 (x), Ordinance No. 46, issued by the Department of Communications in September, 1900, shall not apply.

(a) With the exception of Article 9 to Article 10 (b) and the proviso in Article 16, the regulations in this Ordinance shall apply in the treatment of connected service between wireless telegraphs and the reciprocal dispatch and receipt of telegrams on land. Provided that, if deemed necessary by the Department of Communications, charges for such service shall be specially fixed.

The treatment of, and special fixing of charges for, wireless telegrams referred to in the preceding clause will be separately notified.

FOREIGN WIRELESS TELEGRAPH REGULATIONS.

C The following supplementary regulations came into operation on July 1st, 1913, and apply to all Japanese possessions :—

ART. 1.—Foreign wireless telegrams are understood to be those which are treated according to the regulations of the London International Radiotelegraphic Convention or to the regulations concerning the radiotelegraphic service concluded between the Government of the Empire and foreign Governments or companies.

ART. 2.—The rates to be charged for foreign messages through Japanese coast and ship stations are as follows :—

(1) Coast station rate, 24 yen (fr. 0.60) per word.

(2) Ship station rate, 16 yen (fr. 0.40) per word.

The coast station rate referred to in the preceding paragraph includes the rate applicable to the transmission on telegraph lines for wireless messages originating in or destined for the Japanese Empire or Southern Manchuria or for ship's stations and the Japanese telegraph service. As regards urgent wireless messages for transmission over land lines, an extra 10 yen (fr. 0.25) will be charged.

ART. 3.—The rates to be charged for foreign radiotelegrams through foreign coast or ship stations will be indicated separately.

ART. 4.—The ordinary rate for foreign wireless messages accepted by a Japanese ship station for transmission through a foreign coast station will be fixed by the owners of the said foreign coast station.

ART. 5.—For the acknowledgment of receipt of foreign wireless messages handed in at a Japanese telegraph office and destined for a ship station and transmitted thereto through a Japanese wireless coast station, the rate for the acknowledgment of receipt of interior telegrams for transmission between Japan and Southern Manchuria will be charged.

ART. 6.—At the request of the receiver, or of the person empowered to receive messages for and on behalf of the receiver, wireless messages may be retransmitted only over Japanese land lines.

ART. 7.—When the Japanese coast station given by the sender of a foreign wireless message destined for a ship cannot transmit the said message it may be transmitted through another Japanese coast station, provided such station is suitable for the purpose. This provision also applies in case the Japanese ship station cannot transmit a foreign wireless message to a Japanese coast station mentioned by the sender and where another Japanese coast station exists and which is capable of performing the duty.

ART. 8.—Japanese ship stations cancel foreign wireless messages when they are not in a position to transmit the same to the corresponding stations.

ART. 9. (i) Should a foreign wireless message be cancelled in accordance with Article 8, the sender shall be at once advised and the money paid by him returned without delay.

(ii) Foreign wireless telegrams passing between the Imperial [Japanese] Telegraph Office in Shanghai and Imperial ship stations through the intermediary of Imperial coast stations and, as circumstances require, ship stations may be entered in the Japanese language.

(iii) Article 3, Article 4, clauses i and ii and Article 5, clause i, of the Wireless Telegraph Regulations, Ordinance No. 16 of the Department of Communications, issued in April, 1908, provide for foreign wireless telegrams in Japanese.

(iv) Reply prepaid foreign wireless telegrams in Japanese must be marked "reply prepaid," followed by the amount paid for reply.

(v) Foreign wireless telegrams dispatched or received at the places announced separately will be transmitted through the intermediary of telegraph offices specially indicated.

(vi) The treatment of foreign wireless telegrams in accordance with the preceding Article is subject to the general regulations relating to foreign telegrams.

ART. 10.—Matters not specially provided for in this Ordinance, as regards Japanese telegrams, foreign telegrams in Japanese, and other items, are subject to the general regulations relating to foreign telegrams.

REGULATIONS RELATING TO PRIVATE WIRELESS TELEGRAPHS.

(Ordinance No. 46, Department of Communications, October 26th, 1915.)

D

ART. 1.—The words "disconnected from public communications" in clauses iii and iv Article 2, of the Wireless Telegraph Law mean that the location for fitting up private wireless telegraph apparatus must be outside the boundaries of direct telegram delivery or telephone subscription or on vessels on which no telegraph office is established.

ART. 2.—Wireless telegraphs set up in accordance with clause v, Article 1, of the Wireless Telegraph Law are limited to provision for experiments connected with the science and apparatus of wireless telegraphy.

ART. 3.—Permission will be given to the furnishing of vessels with aerial apparatus and its use for wireless telegraphy by private persons.

ART. 4.—The apparatus and equipment of private wireless telegraphs, except in specially indicated cases, will be required to conform with the following clauses:—

(i) The apparatus must be capable of transmitting eighty kana characters or twenty European words per minute.

(ii) The receiving apparatus must be capable of receiving messages transmitted on electric wavelengths of from 100 to 1,800 metres.

(iii) The power supplied to the transmitting circuit corresponding to the distance required to be reached in the daytime must not exceed the following standards (measured at the primary coil of the transformer or at some point corresponding thereto).

Required daytime distance.	Electric power.
20 naut. miles, not exceeding	1 kilovolt amps.
100 " " "	2 " "
200 " " "	3 " "
300 " " "	4 " "
400 " " "	5 " "
500 " " "	7 " "

(iv) The electric waves should be pure and suffer but little diminution. The installation must be capable of using waves of such length as may be specifically indicated between 100 and 1,800 metres.

ART. 5.—The establishment and maintenance of private wireless telegraphs required to be installed at certain telegraph offices in accordance with clause iii, Article 2, of the Wireless Telegraph Law will be carried out by the Communications Office having local jurisdiction or a first-class post office dealing with branch administrative business.

Persons establishing private wireless telegraphs under this Article must be responsible for the supply of and expenditure on articles required for their establishment in accordance with details furnished by the Communications Office having local jurisdiction or the first-class post office dealing with branch administrative business, and must further pay expenses of maintenance.

ART. 6.—Persons proposing to establish private wireless telegraphs must append to their application documents inscribed with particulars under the following headings, submitting the whole to the Minister of Communications. Changes occurring under headings (i) to (iv) must similarly be notified.

(i) The object of the installation and grounds for its necessity.

(ii) Site of installation (full address or name of vessel).

(iii) Plan of construction (nature of apparatus, method of mounting, height of electric standards [masts], electric power, distance required to be reached in the daytime, details of supplementary equipment where required).

(iv) Hours open for operation.

(v) Nature of vessel, gross tonnage, owners, course navigated, and regular port of mooring (the principal home port of anchorage should be taken as the regular port of mooring).

(vi) Time required for completion.

The site of installation on vessels under heading (ii) and the plan of construction under heading (iii) should be illustrated by separate drawings.

ART. 7.—Where changes have been made in details under headings (v and vi) of the preceding Article, they must at once be notified to the Minister of Communications. In the case where the regular port of mooring has been changed such change must be notified also to the Communications Office having jurisdiction over, or the first-class post office dealing with branch administrative business at, the former port of mooring.

ART. 8.—When the fitting up and construction of a private wireless telegraph have been completed, the fact must at once be notified to the Minister of Communications.

ART. 9.—When the Minister of Communication has received a report under the preceding Article, he will send inspectors to examine the apparatus and fittings, after which a license will be granted. Provided that where a special inspection is not deemed necessary a license may be issued forthwith. If deemed specially desirable by the inspectors under this Article a temporary license will be issued for the opening of operations by the private wireless telegraph concerned.

ART. 10.—When a private wireless telegraph establishment is to be closed up, a notification to this effect must be sent to the Minister of Communications seven days earlier. Similar notice must be given in the case of suspension of a private wireless telegraph establishment.

ART. 11.—When a private wireless telegraph establishment has been closed up, the aeriels must be removed immediately, and, unless special instructions have been given, apparatus specially pertaining to wireless telegraphy—dynamos, secondary electric batteries, distributing apparatus, electromotors, motor generators, transformers, electric standards, transmitters, receivers, meters, etc.—must be dismantled and removed within ten days. Where sanction to a private wireless telegraph has been withdrawn the same provision applies.

ART. 12.—When a change is made in the proprietorship of a wireless telegraph installation, a written application for permission, jointly signed with both old and new names, must be submitted to the Minister of Communications.

Where, owing to succession on the decease of the proprietor or other causes, joint signatures cannot be obtained, a certificate to this effect must be appended to the application.

ART. 13.—The length of electric waves and the call signal to be adopted by a private wireless telegraph will be decided by the Minister of Communications.

ART. 14.—When a private wireless telegraph has been sanctioned by the Minister of Communications details of the installation under the following headings will be officially announced. This applies also to changes effected therein:—

- (i) Name of person setting up installation.
- (ii) Object of installation.
- (iii) Site of establishment.
- (iv) Call signal.
- (v) Ordinary range of distance.
- (vi) Method of fitting up.
- (vii) Electric wavelength used.
- (viii) Hours open for operation.

ART. 15.—Operators of private wireless telegraphs are required to possess the proper qualifications in conformity with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs. Provided that exception be made in the case of operators of private wireless telegraphs established in accordance with clause v, Article 2, of the Wireless Telegraph Law, who have received the special sanction of the Minister of Communications.

ART. 16.—Proprietors of private wireless telegraphs must notify the Minister of Communications of all appointments or dismissals of operators in the employ. In the case of appointments, copies of antecedents form, certificate of physical examination and certificate of eligibility awarded on qualifying examination for operators of private wireless telegraphs must be appended.

ART. 17.—Where the Minister of Communications has ascertained that an operator of a private wireless telegraph is incompetent in the performance of his duties he may order the dismissal of such operator.

ART. 18.—A private wireless telegraph establishment shall not begin operations until a license or temporary license has been received in accordance with Article 9.

ART. 19.—When a private wireless telegraph establishment has begun operations the Minister of Communications must at once be notified accordingly. Provided that when the installation is one set up in accordance with clause iii, Article 2, of the Wireless Telegraph Law, notification will be required seven days before the opening of operations.

This Article applies also to reopening of operations after notification of suspension has been made in accordance with Article 10.

ART. 20.—The employment of private wireless telegraphs is required to conform with the following paragraphs. Provided that exception be made in the case of communications falling within the purview of Articles 22 to 24.

- (i) Only when not causing disturbance to messages sent by the general public or to military communications.
- (ii) In the case of installations on vessels, only whilst on voyage.
- (iii) In the case of installations set up in conformity with clause v, Article 2, of the Wireless Telegraph Law, only when not causing disturbance to communications from other wireless telegraphs.

ART. 21.—Communications sent by private wireless telegraphs must be in Morse symbols, and the method of transmission, except where special instructions are issued, must conform with the following provisions:—

- (i) Before making a call, the receiver must be regulated to the best degree of perception to determine whether a message is

already in transmission. A call must not be made until such message, if any, is completed.

(ii) When making a call the "begin communication" signal — — — — — must first be sent, followed by the call signal of the party signalled, repeated three times, then the introductory signal — — — — — followed by own call signal, repeated three times.

(iii) When the signalled party replies, he must send the "begin communication" signal — — — — — followed by the signalling party's call signal repeated three times, then the introductory signal — — — — — followed by his own call signal and the "clear for transmission" signal — — — — —. This applies also in the case of a reply to the call under provision vi.

(iv) When there is no reply from the signalled party to the call made under provision ii, repeat the signals in proper order three times at intervals of two minutes. If there is still no reply, allow fifteen minutes to elapse, then make the call again in the same manner.

(v) When communicating with the signalled party by means of the international shipping signals, continue the call by sending the international shipping signal PRB.

(vi) When wishing to detect a wireless message within own range, use the "Inquiry signal" — — — — — and make the call provided under (ii).

(vii) When the signalled party replies, begin the required message immediately, and at its ending send the "end communication" signal — — — — — and own call signal, followed by the "clear for transmission" signal — — — — —.

(viii) When the signalled party has comprehended the message, he must immediately signify its receipt by sending the signal "understand communication" — — — — —.

(ix) When mutual messages have been completed, both parties must exchange the "finished" signal — — — — — and their own call signals.

(x) When in the case of an experimental message sent out by a wireless telegraph established in accordance with clause v, Article 2, of the Wireless Telegraph Law the call signal of another party is not required, repeat own call signal three times and after ascertaining that there is no danger of hindering another message, begin the required communication, and at its ending send the "end communication" signal — — — — — and own call signal. Provided that such communication must not exceed twenty minutes in duration.

ART. 22.—When dispatching a signal of distress at sea by private wireless telegraph, the preliminary "ship in danger" signal, — — — — — should be repeated at frequent intervals according to circumstances followed by the name of vessel in distress, position, and details of conditions and other matters likely to facilitate rescue. If it is desired to get into touch with a specified wireless telegraph a continued series of the "ship in danger" signal — — — — — should be followed by the call signal of the station signalled.

ART. 23.—When a private wireless telegraph detects the "ship in danger" signal — — — — — accompanying a message of distress at sea, it must suspend all other messages and immediately reply, and report

details in the order specified in the last Article to another wireless telegraph situated at the most convenient point for purposes of rescue. Provided that where the message of distress includes a request for specified action before transmitting the report or for specified items to be included therein, such request must be complied with.

In the case of a continued series of the "ship in danger" signal ••••—•••• being followed by the call signal of a specified station, only in the event of no reply being received therefrom should the responsive steps be taken prescribed in the last paragraph.

ART. 24.—When sending out by private wireless telegraph a necessary warning of danger to navigation, repeat the preliminary navigation alarm signal TTT ten times at short intervals, then transmit necessary details, after which, allowing an interval of ten minutes to elapse, repeat the alarm three times. When a private wireless telegraph detects the navigation alarm signal TTT accompanying a necessary warning of danger to navigation, it must suspend all other messages.

ART. 25.—A private wireless telegraph shall not be prevented, in cases of messages coming under the provisions of the last three Articles only, from exceeding the prescribed limit of electric power or wavelength used. Provided that, immediately after such use, the prescribed limits shall be reverted to.

ART. 26.—When a telegraph office has sent out by wireless telegraphy the private "suspend communication" signal —••••— all private wireless telegraph messages within such office's range of distance must be suspended until the private "renew communication" signal ••••—•••• is issued.

ART. 27.—A private wireless telegraph shall not be prevented, in the cases referred to below, from operating outside the objects for which it was established.

(i) When deemed necessary to exchange messages with other wireless telegraphs concerning communications coming within the purview of Articles 22 to 24.

(ii) When deemed necessary to exchange messages with other wireless telegraphs in connection with meteorological and time signals or the adjustment of apparatus.

(iii) When rendered necessary to communicate with a telegraph office equipped with wireless telegraph apparatus, following instructions issued by such office.

(iv) When deemed necessary to exchange messages with military wireless telegraphs to meet the requirements of military communications.

ART. 28.—When a private wireless telegraph has received a request from another wireless telegraph to exchange messages for the purpose of adjusting apparatus, it shall respond thereto, provided there is no danger of obstruction.

ART. 29.—The Minister of Communications shall specially instruct the Wireless Telegraph Inspection Bureau to test a private wireless telegraph with a view to ascertaining whether it is properly employed and whether its communications are in order.

ART. 30.—When sending instructions to a private wireless telegraph relating to its communications, the Wireless Telegraph Inspection Bureau will prefix to its call signal the wireless telegraph inspecting signal ••••—•••• in order to distinguish its message from general communications.

ART. 31.—Where an order is sent direct to an operator relating to the restriction or suspension of operations by the private wireless telegraph operated by him or the removal of its apparatus and accessories, the person responsible for the installation will be separately notified.

ART. 32.—When a vessel with a private wireless telegraph on board comes within the wireless telegraph range of a telegraph office it must briefly report to such office its direction and distance therefrom, together with the direction in which the vessel is moving. When about to withdraw from the range of such office a similar report must be sent.

ART. 33.—The person responsible for a private wireless telegraph must report to the Minister of Communications, at the same time giving details, on all circumstances falling under the following headings:—

(i) When special restrictions have been imposed on the equipment and operation of the wireless telegraph concerned in foreign waters. Provided that exception be made where such restriction has been officially announced.

(ii) When messages have been sent in accordance with Articles 22–24.

(iii) When cases of contravention of the Wireless Telegraph Law or the Regulations connected therewith on the part of a private or foreign wireless telegraph have been detected.

(iv) When matters have arisen calling for special attention in regard to the results of wireless telegraphy or other features.

ART. 34.—The person responsible for a private wireless telegraph must keep a journal and cause the operator to record therein the items coming under the following headings:—

(i) Time of beginning and end of messages, and wireless station signalled.

(ii) Nature of message.

(iii) The circumstances coming under Articles 27 and 33, and the steps taken in accordance therewith.

(iv) In the case of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, the results of experiments.

(v) In addition to the matters under the above headings, references for future use. Communication journals as prescribed in this Article must be preserved for fifteen months, counting from the month following that in which they are completed.

ART. 35.—The person responsible for a private wireless telegraph must affix in his operating room, where they can easily be seen, his certificate, together with copies of the penal clauses of the Wireless Telegraph Law and a list of the essential objects for which the installation was established.

ART. 36.—The Minister of Communications will from time to time specially send officials to examine reports, and documents connected therewith, on the apparatus mounting and operations of private wireless telegraphs, in such cases the officials concerned will carry proof of their competency.

ART. 37.—Documents to be sent in under the provisions of Articles 7, 8, 10 and 19 may be replaced by telegrams.

ART. 38.—Documents to be submitted under this Ordinance to the Minister of Communications, with the exception of those coming under the preceding Article, must all be passed through the Communications Office having jurisdiction over, or the first-class post office dealing with

branch administrative business at, the place of a land installation or the regular port of mooring of a vessel having an installation.

Supplementary Regulations.

ART. 39.—The provisions of Articles 1 to 3, 5 to 14, 18 to 20, 22 to 38, apply to private wireless telephones, and the provisions of Articles 22 to 24, 26, 29 to 31 and 36 apply to wireless telegraphs or telephones installed on foreign vessels.

ART. 40.—This Ordinance comes into force on November 1st, 1915.

REGULATIONS RELATING TO QUALIFYING EXAMINATIONS FOR OPERATORS OF PRIVATE WIRELESS TELEGRAPHS.

E (Ordinance No. 48, of the Department of Communications, October 26th, 1915.)

ART. 1.—Persons aged seventeen or above qualifying for posts as operators of private wireless telegraphs will be examined and approved according to the following classification:—

Class I.—Persons capable of operating private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2.

Class II.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2 (except those set up under clause iii) and of private wireless telegraphs set up under the provisions of clause iii of the same Article.

Class III.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2, clause v, and of private wireless telegraphs set up under the provisions of any one of the clauses of the same Article.

ART. 2.—Examinations will be carried out by the Qualifying Examination Committee for Operators of Private Wireless Telegraphs appointed by the Minister of Communications. The subjects for examination are as follows:—

(1) Wireless Telegraphy: Theory (for Class I only), adjustment and use of apparatus (for Classes I and II only).

(2) Practical Electric Telegraphy: Transmission of a message in Japanese and a European language and reception of a message by sounder. Standard of speed to be—for Class I, eighty *katakana* characters (syllables) or twenty European words per minute; and for Classes II and III, fifty *katakana* characters (syllables) or twelve European words per minute.

(3) Wireless Telegraph Laws and Regulations: General Laws and Ordinances relating to wireless telegraphs (for Classes I and II only); Laws and Ordinances relating to private wireless telegraphs (for Class III only).

(4) English language: Rudiments (for Classes I and II only).

ART. 3.—The Minister of Communications will award certificates of eligibility (form No. 1) to successful candidates in the examination.

ART. 4.—Persons who have had not less than two years' practical experience in the public telegraph or wireless telegraph service or in military wireless telegraphy may be granted certificates of eligibility according to the following classification without undergoing examination, on review by the Qualifying Examination Committee for Operators of Private Wireless Telegraphs.

(1) Persons engaged in the public wireless telegraph service—for Class I or lower.

(2) Persons engaged in military wireless telegraphy—for Class II or lower.

(3) Persons engaged in the public telegraph service—for Class III.

These provisions apply also in the case of persons holding second or third-class certificates of eligibility according to the following classification:

(1) Persons holding second-class certificates of eligibility who have been engaged for not less than two years as assistant operators of private wireless telegraphs established in accordance with the Wireless Telegraph Law, Article 2, clause iii—for Class I.

(2) Persons holding third-class certificates of eligibility who have been engaged for not less than two years as assistant operators of private wireless telegraphs—for Class II.

ART. 5.—Persons holding a certificate of study for completion of training in wireless telegraphy, practical electric telegraphy, and Wireless Telegraph Laws, and Regulations, in accordance with the classifications determined by the Ministry of Communications, with the object of engaging in wireless telegraphy, may be granted certificates of eligibility, for Class I or lower, on review.

ART. 6.—Examinations will be held annually. Date, place and other details thereof will be announced in the *Official Gazette*. Provided that if deemed necessary by the Minister of Communications extra examinations may be held at special times.

Reviews by the examiners will take place according to circumstances.

ART. 7.—Candidates for examination must submit to the Minister of Communications before the appointed date an application in writing (Form No. 2), appending thereto a statement of antecedents (Form No. 3), an abstract of the Census Register, and a photograph.

ART. 8.—Candidates for examination must pay an examination fee of two yen in Class I and one yen in Classes II and III, affixing to the application form a revenue stamp for the amount.

Fees already paid for examination cannot be refunded to candidates failing to pass the examination or to those disqualified under the provisions of Article 9.

ART. 9.—Where the Qualifying Examination Committee for Operators of Private Wireless Telegraphs have detected false statements in a form of antecedents or improper behaviour during examination, they will disqualify the candidate concerned.

Where the facts of a case coming under the provision of this Article are discovered after the candidate has passed the examination, his certificate of eligibility will be invalidated.

ART. 10.—The names of successful candidates will be announced in the *Official Gazette*.

ART. 11.—Where the holder of a certificate of eligibility has changed his name or lost or damaged his certificate, he may apply to the Minister of Communications for a revision or renewal thereof.

Applicants under this provision must pay a fee of thirty sen for revision or renewal of certificate affixing to the letter of application a revenue stamp for the amount.

Additional Regulation.

This Ordinance comes into force on November 1st, 1915.

(Form No. 1.)

Certificate of Eligibility awarded on Qualifying Examination for Operators of Private Wireless Telegraphs.

Name
Address
Date of birth
Eligible for Class No.

This is to certify that the above-named is qualified in the class designated in accordance with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

Name (seal)
President of Qualifying Examination Committee for Operators of Private Wireless Telegraphs.
Date

The certification of the President of the Qualifying Examination Committee for Operators of Private Wireless Telegraphs is sanctioned and a certificate of eligibility hereby granted.

(This certificate of eligibility falls within the category of Class A (B) certificates under the provisions of the Regulations relating to Business annexed to the International Wireless Telegraph Convention of London, and the holder of this certificate declares his acceptance of the obligation strictly to preserve the secrecy or communications under the whole of the Regulations.)

(Seal) Minister of Communications.
Date

Notes:—

- (1) On the back, in the cases of Classes I and II, appears a translation in a foreign language.
- (2) The paragraph in parentheses appears in the cases of Classes I and II.

(Form No. 2.)

Memorandum (on Mino paper).

Form of Application for Qualifying Examination for Operators of Private Wireless Telegraphs.

Affix
Revenue
Stamp
here.

Name of applicant
Address
Date of birth
Class qualifying for: No.

I am desirous of undergoing
{ examination to }
{ review by examiners to } qualify for the
above Class in accordance with
{ the provisions of the } Regulations relating
{ Article 4 (or 5) of the }
to Qualifying Examinations for Operators of
Private Wireless Telegraphs, and append the
documents required by Article 7 of the same
Regulations.

Name (seal)
Present address
Date

To the Minister of Communications.

(Form No. 3.)

Memorandum (on Mino paper).
Statement of Antecedents.

Name
Social status and domicile
Date of birth

Education:—

School Section Date of
entry

School Section Date of
completion of studies, graduation, or
leaving school (abstract of
graduation certificate or certificate of
study appended).

Occupation:—

Government office or private firm (fill in
name)..... Date of entry.... Occupa-
tion followed (references from the Govern-
ment office [or firm] appended).....

Awards or penalties:—

Description Date

The above is a correct statement.

Name (seal)

Present address

Date

Note.—A detailed statement of matters relating to telegraphy or wireless telephony is required. Attention is directed to the following points:

- (1) The applicant's name must be inscribed on the photograph.
- (2) The revenue stamp must not be cancelled.

REGULATIONS REGARDING THE QUALIFICATIONS OF WIRELESS OPERATORS.

The following Regulations regarding the qualifications of wireless operators have been issued from the Department of Communications:—

- (i) Substitution of Foreign Operators.
- (ii) Qualification of Wireless Operators on Fishing Trawlers.
- (iii) Amendment to the Regulations regarding Qualifying Examination for Operators of Private Wireless Telegraphs.

I.—FOREIGN OPERATORS MAY BE SUBSTITUTED.

In order to prepare against possible instances where wireless operators on board Japanese ships for the service to foreign ports will be unable to attend their duties because of sickness and other inevitable circumstances, 1st and 2nd class foreign operators having certificate for the license of A or B category may be employed as substitutes to Japanese operators, subject to the approval of the Minister of Communications, in consequence of the putting the compulsory wireless regulations into effect in England. In case of application for the employment of foreign operators under the foregoing paragraph, certificates will be given them by the Ministry of Communications. Aboard ships employing foreign operators an office for public communications in foreign languages may be opened.

II.—QUALIFICATION OF WIRELESS OPERATORS ON FISHING TRAWLERS.

In view of the fact that the wireless equipment aboard fishing trawlers will not only facilitate the safety of their voyage and immediate relief from accidents, but will also be a great advantage for the fishing industry by signalling the presence of swarms of fish and other discoveries to companion ships, it is no longer uncommon for trawlers and smaller crafts to be equipped with wireless apparatus. Hitherto, however, only 1st class operators have been admitted to engage in the wireless service on these ships, which has proved to be quite inadequate. The regulations are now amended to the effect that 2nd class operators will henceforth be admitted as senior operators on the ships carrying on the wireless service in Japanese language. In view of the actual importance, certificate of the license as 2nd class operator will be granted by the Ministry of Communications to those having practical experience in wireless communications in the Navy and other establishments.

III.—AMENDMENT TO THE REGULATIONS REGARDING QUALIFYING EXAMINATION AS WIRELESS OPERATORS FOR PRIVATE ESTABLISHMENTS.

In view of the growing increase of applicants for the license as wireless operators in private establishments, the Regulations regarding the qualifying examination are amended as follows :

(a) Instead of the names of applicants, their number will be written in examination papers.

(b) The result of the examination will be announced in each subject on the day of its examination for the purpose of selection and dispensing with further trouble with the rest of the examination.

(c) Wireless experts in the Army and Navy will also be included in the examining committee.

KENYA COLONY AND PROTECTORATE

(See also Map Section)

THE territory covered under the above title extends from the Umba to the Juba River, and inland as far as the borders of Uganda. It includes the mainland dominions of the Sultan of Zanzibar (these having been leased to Great Britain for an annual rent).

The Administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. J. Gosling	Postmaster-General	Nairobi.
Mr. J. K. Creighton ..	Telegraph Engineer	Nairobi.
Mr. H. J. W. Ridley ..	Assistant Telegraph Engineer	Mombasa.
Mr. G. F. Ball	Wireless Telegraph Engineer	Kismayu.
Mr. A. Kane	Do. Do.	Nairobi.
Mr. J. Gornall	Do. Do.	Kismayu.
Mr. G. E. Hughes	Do. Do.	Mombasa.
Mr. F. Wrigglesworth ..	Do. Do.	Mombasa.

ORGANISATION.

At present there are two radio stations open for public traffic in this territory—one at Mombasa and the other at Kismayu, in Jubaland, whilst the construction of a third station is contemplated.

The Mombasa station is equipped with a 5 kilowatt synchronised spark, with a spark frequency of 600 per second. The note emitted is pure musical and somewhat high. This plant is only used when the state of the atmosphere will not permit the small plant to be used, the particulars of which are as follows :—

A 1½ kilowatt synchronous direct-coupled plant capable of transmitting to ships a distance of 350 nautical miles. The usual frequency of the discharger is 750 per second, which has been found to give the best results in this locality.

The Kismayu station is equipped with a 3 kilowatt synchronous spark set having a frequency of 600 per second.

A radio service is maintained with Mombasa as a means of communication with Jubaland.

At present there are no private or experimental stations in the territory, neither have any licenses been issued for ship stations registered therein. An aerodrome is in contemplation for Kisumu on the shores of Victoria Nyanza.

ADMINISTRATION.

Radiotelegraphy is administered under the following :—

A—Wireless Telegraphy Ordinance, 1913.

B—Experimental License issued thereunder.

WIRELESS TELEGRAPHY ORDINANCE, 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. The expression "wireless telegraphy" means any system of communication by telegraph as defined by the Indian Telegraph Act, 1883, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand and five hundred rupees or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor may make regulations for all or any of the following matters:—

(i) for prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any license;

(iii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Protectorate shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established,

installed, or worked in the Protectorate or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting, except with the special or general permission of the Postmaster-General of the Protectorate, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Protectorate;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Protectorate, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all classes or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any Regulation made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of seven hundred and fifty rupees.

(2) All convictions, forfeitures, and fines under this Ordinance or any Regulations thereunder may be had and recovered before a Magistrate of the first class, and every such Magistrate shall have jurisdiction to pass any sentence authorised by this Ordinance on any European or other non-Native convicted of an offence against this Ordinance notwithstanding anything in any Ordinance or law limiting the jurisdiction of such Magistrate over Europeans and non-Natives.

9. The Wireless Telegraph Ordinance, 1908, is hereby repealed: Provided however—

(1) Every license granted under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been granted under this Ordinance.

(2) All Regulations made under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been made under this Ordinance and shall continue in force until other provision is made.

LICENSE.

B In exercise of the powers conferred upon me by Section 7 of the Wireless Telegraphy Ordinance, 1913, I, Edward Northey, Major-General of His Majesty's Forces, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Companion of the Most Honourable Order of the Bath, Governor and Commander-in-Chief of the Colony of Kenyaland and the East African Protectorate, do hereby license, and authorise residing at to conduct experiments in wireless telegraphy and for such purpose to import Wireless Telegraph apparatus and install the same at such places as the Postmaster-General shall approve

subject to the conditions and restrictions following, that is to say:—

1. All apparatus utilised pursuant to the provisions of this license shall be used solely for the purpose of scientific study in wireless telegraphy and in no case shall the licensee install apparatus capable of being used for the purpose of sending wireless signals, or use the receiving apparatus for the purpose of receiving either private messages or for any commercial telegraph traffic whatsoever.

2. This license shall remain in full force and operation for from date hereof.

Given under my hand at Nairobi this day of 1920.

Governor and Commander-in-Chief.

LABRADOR

(See under NEWFOUNDLAND).

LETTONIA (LATVIA)

(See also Map Section.)

LATVIA, one of the new Baltic States, proclaimed her independence (from Russia) on November 18th, 1918, which was recognised "de jure" by the Supreme Council on January 26th, 1921, and the new state was admitted to the League of Nations on September 22nd, 1921. The country constitutes a part of the territory lying around the Gulf of Riga and along the Baltic Sea southward of Liepaja (Libau).

Its area is about 24,440 square miles, with a population of 1,900,000; the overwhelming majority of that (81 per cent.) are Letts, the oldest Indo-European race.

The Government of Latvia, according to the Constitution of 1922, is republican, representative and democratic. It is composed of the Legislature, the Executive and the Judicature. The Legislature is the National Assembly ("Saeima"), and the Executive are the President of the Republic and the Cabinet of Ministers.

CONTROL.

The control of wireless telegraph operations, except military and naval stations, is in the hands of the Director-General of Posts and Telegraphs, assisted by the Central Wireless Section of the Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eduards Kadikis	Director-General of Posts and Telegraphs	Riga
Janis Linters	Chief of Central Wireless Section..	Riga

ORGANISATION.

At the present time the following wireless stations are in operation:—

Coast Stations (P.G.)	.. .. .	2
Coast Stations (Official)	.. .. .	1
Ship Stations (Commercial)	.. .. .	6
Central Receiving Station	.. .. .	1

There are no direction finding stations, no amateur or radio clubs and no amateur licenses. There are two private receiving stations for time and meteorological signals and two schools—one for military and the other for private operators.

Riga (KCA), besides the communication with ships, sends every day the Latvian press news and maintains the ordinary telegraphic correspondence with Sweden, Finland and other countries. Storm and mine warnings are also sent from this station.

Liepaja (KCB) sends every day at 0745 the Latvian meteorological report, and in winter ice reports. Storm and mine warnings (QST) are also sent.

ADMINISTRATION.

Latvia was admitted to the International Radiotelegraphic Convention on January 1st, 1922.

Except the above-named Convention Latvia has no laws relating to wireless communication. The Minister of Communication and the Director-General of Posts and Telegraphs have, however, issued the regulations tabulated below. A law is in course of preparation retaining to the State the monopoly of wireless communication.

A—Regulations for Merchant Ships.

B—Regulations for the Examination of Latvia Commercial Radio Operators.

C—Form of License for the Installation of Wireless Apparatus on boardship.

D—Form of License for Operating Wireless Apparatus on boardship.

E—Form of Certificate of Proficiency in Radiotelegraphy.

EXTRACT FROM MERCHANT SHIPS WIRELESS REGULATIONS.

A 1. No shipboard wireless station on a Latvian merchant ship shall be established or operated without a license issued by the Director-General of Posts and Telegraphs of Latvia.

2. Firstly the shipowner requests permission to provide and establish a wireless station. Secondly the shipowner informs the Director-General of the accomplished installation, how he intends to operate it, the hours of service, wavelength, etc., and requests a license for operating.

3. If the station fulfils all prescriptions of the radiotelegraphic regulations the Director-General delivers the requested license. This license is to be produced anywhere at Latvian or foreign ports on request by the wireless inspectors of these ports.

4. The Director-General determines the international call signal and takes steps to ensure that the name of the ship station is incorporated in the international list of the world's wireless stations.

5. The shipboard station and operators shall fulfil all prescriptions of the Radiotelegraphic Convention, 1912. In case of contravention they are liable to punishment, and their licenses and certificates annulled.

6. The Latvian shipboard wireless stations charges are determined by the Director-General.

(Signed) ED. KADIKIS,

Director-General.

J. LINTERS,

Chief of Central Wireless Section.

Confirmed by the Minister of Communications,
Riga, March 30th, 1922.

EXTRACT FROM THE REGULATIONS FOR THE EXAMINATION OF LATVIAN COMMERCIAL RADIO OPERATORS.

B In conformity with Art. 10 of the London Radio Telegraphic Convention of July 5th, 1912, I publish the following decree:—

1. Situations on Latvian merchant ships are available only to such radio operators who have a certificate issued by the Director-General.

2. This certificate will be delivered after an examination and after the aspirant has signed a declaration that he will keep secret the radiotelegraphic correspondence.

3. Every radio operator can be re-examined should the progress in radiotelegraphy demand it. The certificate can be given for a determined time.

4. At present, and in special cases, aliens can obtain certificates as radio operators on board Latvian ships.

Riga, March 30th, 1922.

(Signed) ED. KADIKIS,

Director-General.

LICENSE FOR THE INSTALLATION OF A SHIPBOARD WIRELESS STATION.

..... STEAMSHIP Co., LTD.

C You are hereby authorised to acquire for your ship " " but and " " net R.T. a wireless telegraph shipboard station of a size that conforms to the regulations of those countries which your ship is to visit, and to install the station on board the ship.

The installation will be tested and certified at the ships next arrival at Riga. For shipboard wireless station the call signal " " has been reserved.

Riga, " " th, 1922.

(Signed)

Director-General

of Posts and Telegraphs of Latvia.

Chief of Wireless Section.

LICENSE.

D In conformity with the regulations of the International Radiotelegraphic Convention London 1912, by these presents it is permitted (cope 1 for communication the radiotelegraphic station, installed with my permission on board the Latvian ss. " " belonging to the port of Riga.

The Latvian Post and Telegraph Administration certifies that the station mentioned as described below fulfils all the conditions cited in conformity with the International Radiotelegraphic Convention and has been registered relative to this service as shipboard station of the third Class.

Riga, 1922.

(Signed) *Director-General
of Posts and Telegraphs of Latvia.*

SCHEDULE OF STATION AND APPARATUS.

1. Ship, Steamer.
2. Registered tons, gross.
3. Owner.
4. Home port.
5. International Code letters.
6. Radio call letters.
7. Nature of service.
8. Hours of operation.
9. Class.
10. Ship charge ;
 With Latvian coast or shipboard stations,
 05 centimes per word.
 With foreign coast or shipboard stations,
 15 centimes per word.
11. Normal day range in nautical miles with
 other ship at sea.
12. System.
13. Power :
 Transformer input.
 Primary source of power.
 Direct current generator.
14. Characteristics of transmitting system.
15. Characteristic of receiving system.
16. Wavelength range of receiver.
17. Antenna.
 Type of aerial.
 Essential dimensions.
18. Auxiliary apparatus :
 Emergency set.
 Power. Source.
 Normal day range with ships.
19. Wavelength. Antenna Current,
 (amperes).
 300 —
 450 —
 800 —
 600 —

(Signed)
Chief of Central Wireless Section.

Inspectors.

CERTIFICATE OF PROFICIENCY IN
RADIO TELEGRAPHY.

.....CLASS.

E This is to certify that under the provisions of the Radiotelegraph Convention, 1912, Mr. _____ has been examined in radiotelegraphy and has passed :

- (a) The working and adjustment of wireless apparatus ;
 - (b) Transmission by Morse key and sound reading by head telephones at a speed of not less than _____ words a minute.
 - (c) Knowledge of the regulation applicable to the exchange of the radiotelegraph traffic.
- The holders practical knowledge of adjustment was tested on a Telefunken 2 kW. tonic train spark ship station.
- It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of telegraph correspondence.
- The holder of this certificate is therefore authorised to operate wireless apparatus on board a Latvian ship for two years.

Riga, 192 .

Examining Officers.

On behalf of the Minister of Communications,
(Signed)

*Director-General
of Posts and Telegraphs of Latvia.*

THE HOLDERS DESCRIPTION.

Name _____
Date of Birth _____
Place of Birth _____
Citizenship _____
Any special peculiarities _____
Note : On demand the national passport is to be produced.

OBLIGATION.

I,
give the solemn promise that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely, without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office.

Riga, 192 .

(Signed)

Operator.

I certify the justness of the holders description and his own hands signature.

(Signed)

Chief of Central Wireless Section.

LIBERIA

(See also Map Section.)

THE only independent "black" republic in the Old World, owes its inception (in 1847) to an effort on the part of American and European slave emancipators to found a country for freed negro slaves in the continent which formed the original home of the race. It lies on the west coast of Africa, approximately between 5° and 10° N. latitude and 7° and 11° W. longitude, possessing about 350 miles of coast line. The executive authority is vested in a President, a Vice-President, and a Council of six Ministers, and the legislative power in a Parliament of two Houses, known respectively as the Senate and House of Representatives.

CONTROL AND ORGANISATION.

Wireless telegraphy is represented by a station situated at Monrovia, under the jurisdiction of the French Government, which is open for public correspondence with ships.

LIECHTENSTEIN

(See also Map Section)

LIECHTENSTEIN is the small but sovereign Principality which lies on the northern slopes of the Rhetian Alps between Switzerland and Austria (geographically $47^{\circ} 16' 10''$ N, $47^{\circ} 02' 49''$ S and $9^{\circ} 37' 40''$ E, $9^{\circ} 28' 16''$ W). The mountain ridges of the Rhetian group (2,000-2,600 m.) form the boundary towards Grisons and Vorarlberg, while the Rhine fixes the limits of the Principality on the other side towards the Canton St. Gall. The whole territory has an area of 157 square kilometres and numbers some 10,000 inhabitants. The population speak a German dialect. Its main occupation lies in agriculture.

Liechtenstein is a democratic monarchy. The reigning Prince, Johann II, attains his 82nd birthday next year, which is also the 64th year of his reign. On October 2nd, 1921, he gave his sanction to a new and modern constitution which was agreed to in the Assembly.

CONTROL AND ORGANISATION.

In 1921 the Swiss League took over the administration of post, telegraph and telephones.

ADMINISTRATION.

The regulations relating to radiotelegraphy and telephony are in the hands of Switzerland, with whom a Convention exists to that effect.

Actually there are no radioelectric installations in the territory, but regulations have been provided for such contingencies.

A—Convention between the Swiss Federal Council and the Government of the Principality of Liechtenstein.

CONVENTION.

A Concluded between the Swiss Federal Council and the Government of the Principality of Liechtenstein relating to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

Concluded on the 10th of November, 1920.
Brought into operation on the 1st of February, 1921.

THE FEDERAL COUNCIL OF THE SWISS CONFEDERATION.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification, between the plenipotentiary of the Federal Council, in the name of the Swiss Confederation, and that of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality, with regard to the exploitation of the postal, telegraphic and telephonic services of the Principality of Liechtenstein in the hands of the administration of Swiss telegraphs and telephones, which Convention was approved by the States Council on the 10th December, 1920, and by the National Council on the 17th of the same month, and of which the following is the text.

THE GOVERNMENT OF THE PRINCIPALITY OF LIECHTENSTEIN.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification between the plenipotentiary of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality and that of the Federal Council, in the name of the Swiss Confederation with regard to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the

hands of the administration of Swiss posts and the administration of the Swiss telegraph and telephones, which Convention was approved by the assembly of Liechtenstein on the 29th of December, 1920, and which runs as follows—

The Swiss Federal Council and His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the traditional spirit of good neighbours, have resolved to conclude a Convention in order to assure the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts, telegraphs and telephones, and have appointed their plenipotentiaries to this effect, viz. :—

The Swiss Federal Council, M. Giuseppe Motta (doctor of laws), President of the Swiss Confederation, Chief of Federal Political Department, H.S.H. the reigning Prince of the Principality of Liechtenstein, M. Emile Beck (doctors of laws), Charge d'Affaires of the Principality of Liechtenstein, in Switzerland, who, having presented their full powers, recognised in proper and due form, arranged the following provisions.

CHAPTER I.

GENERAL PROVISIONS

ART. 1.—The postal service, including the postal cheque service and that of the postal savings bank, as also the telegraphic and telephone services of the Principality of Liechtenstein, are exploited for the Principality by the care of the management of the Swiss posts and the management of the Swiss telegraphs and telephones.

ART. 2.—The Swiss rules and regulations having reference to the postal, telegraphic and telephone service, as well as the agreements and statements concluded between Switzerland and foreign countries, are applicable in the Principality of Liechtenstein in the same way as in Switzerland.

ART. 3.—Inasmuch as their repression is foreseen by the law, the contraventions of the federal fiscal laws are deferred, in the first instance, to the tribunal at Vaduz.

The cantonal tribunal of St. Gaul is appointed as a court of appeal, and the federal tribunal at Lausanne as supreme court of appeal.

ART. 4. (1) The post, telegraph and telephone offices of the Principality of Liechtenstein must be appointed as such, although they depend exclusively upon the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

(2) Only the armorial bearings and national colours of the Principality will figure on notices, stamps and official seals of the post, telegraph and telephone offices of the Principality.

(3) The employees of Liechtenstein nationality engaged in the Principality are required to furnish their caps with the Liechtenstein badge, and the wearing of this cap is compulsory.

CHAPTER II.

POSTAGE STAMPS, TAXES AND DUES.

ART. 5.—(1) (Concerning postage stamps.)

(2) (Concerning the sale of postage stamps.)

(3) (Concerning forgeries of postage stamps.)

ART. 6.—(1) The same taxes and dues will be gathered in the postal, telegraphic and telephone traffic between Switzerland and Liechtenstein as in the Swiss interior traffic. In that which concerns the postal, telegraphic and telephone traffic between the Principality of Liechtenstein and abroad the tariffs are the same as those applied by Switzerland in her traffic with abroad.

(2) The rights of freedom from tax in the Principality is regulated by the same decrees as in Switzerland.

CHAPTER III.

SERVICE OF OFFICIALS AND EMPLOYEES.

ART. 7.—(1) The officials and employees of the postal, telegraphic and telephone services of the Principality of Liechtenstein are engaged by the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones. The Government of the Principality of Liechtenstein has always the right to make proposals for the definite nomination of officials. Except on account of special reasons touching on questions of service, these proposals shall be adopted.

(2) Provisionally, and in so far as the necessities of the service exact it, officials and employees of Swiss nationality may be equally employed in the Principality.

ART. 8.—(1) The officials and employees of the postal, telegraphic and telephonic service of the Principality of Liechtenstein have the same rights and duties as the similar staff engaged in Switzerland.

(2) The authorities, tribunals and district presidents of the Principality of Liechtenstein shall assist this staff in the exercise of its duties in the same degree as the similar authorities in Switzerland.

(3) If an enquiry is held on, or a judgment given against, an official or employee of the postal, telegraphic or telephone service of the Principality, the local tribunals are under the obligation of enforcing the authority to which the accused belongs in the same manner as the Swiss tribunals have to do in like case in Switzerland.

CHAPTER IV.

POSTAL ROUNDS AND TECHNICAL INSTALLATIONS.

ART. 9.—The establishment and suppression of post, telegraph and telephone offices, the establishment, modification and suppression of postal rounds, as well as telegraphic and telephonic installations in the Principality of

Liechtenstein, can only be ordered after an understanding with the Government of this State. The demands formulated on this subject by the Government of Liechtenstein will be taken into consideration, as far as possible, by the Swiss administration so far as it refers to installations the expenses of which are borne by the same Government.

CHAPTER V.

POSTAL CHEQUE AND POSTAL SAVINGS BANK SERVICES.

ART. 10.—(1) (Concerning the Post Office Savings Bank.)

(2) (Concerning the accounts of the Post Office Savings Bank.)

ART. 11.—(Concerning the investment of funds.)

CHAPTER VI.

OWNERSHIP OF THE FUNDS.

ART. 12.—(1) (Concerning the exploitation of funds.)

(2) (Concerning the exploitation of funds.)

ART. 13.—(1) The equipment of the offices and of the staff, as well as of the telegraphic and telephonic installations necessary to assure the exploitation of the postal, telegraphic and telephone services on the territory of Liechtenstein, are the property of the Principality of Liechtenstein.

(2) All acquisitions and installations effected under the regime of the present Convention are done at the cost of the Principality of Liechtenstein, and become its property.

CHAPTER VII.

SETTLEMENT OF ACCOUNTS.

ART. 14.—(1) The receipts and expenses accounts of the postal service of the one part, and those of the telegraphic and telephone service of the other part are settled separately.

(2) They are made up each month by the Swiss administration concerned, and an abstract is sent to the Government of the Principality of Liechtenstein, which must give its opinion in the course of one month. It is allowed that these monthly accounts can be followed by supplementary abstracts of accounts.

ART. 15.—(1) All expenses incurred by the postal, telegraphic and telephone services of the Principality must pass through the accounts in such a manner that only such sums which have been actually spent are mentioned.

(2) The annual expenses occasioned by the general administration (management, superintendence, auditing of accounts, etc.), as well as the purchase of office stock for current use (forms, etc.), are carried to the debit side of the exploitation account at a round figure corresponding approximately to the needs of Liechtenstein.

ART. 16.—(1) All taxes and dues collected in the postal service by the post offices of Liechtenstein accrue exclusively to the Principality of Liechtenstein, and the sum total of these emoluments must, in consequence, be paid into the credit of the exploitation account. On the other hand, the receipts realised by the Swiss offices and arising from the collection of the same, taxes and dues accrue exclusively to Switzerland, and do not affect the accounts in question.

(2) At the same time, the receipts coming from the Liechtenstein postage stamps, which are sold to collectors through the offices specially reserved for this purpose by the Government of the Principality, must not figure in the above-mentioned accounts.

(3) In the telegraphic and telephonic traffic between Switzerland and Liechtenstein, the taxes and dues are also deducted for the profit of the country in which they are collected.

ART. 17.—(1) There is no rebate made with Liechtenstein on the subject of postal traffic between Switzerland and a third country. With what concerns the postal traffic between Liechtenstein and other States, such an allowance will not be necessary as long as the traffic remains about as intense in one sense as another.

(2) In the telegraphic and telephonic working between Liechtenstein and other countries, Liechtenstein receives such portion of the dues accruing to Switzerland from the outgoing traffic. With what concerns the incoming traffic between Liechtenstein and other countries the terminal tax is collected for the benefit of the State.

(3) Each of the contracting parties renounce the right of crediting their accounts with the dues from the transit in the postal, telegraphic and telephonic traffic between Switzerland and Liechtenstein.

ART. 18.—(1) The receipts accruing from the exploitation of the postal, telegraphic and telephone services in the Principality of Liechtenstein are primarily directed to cover the expenses of such exploitation. If the exploitation account shows a credit balance, such becomes the property of the Principality of Liechtenstein. A debit balance is charged to the account of the latter. It will, in addition, have to bear the expenses entailed by all constructions and acquisitions which, according to the opinion of the Swiss administrations, are necessary to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein.

(2) Once the balance sheet is issued, such credit as acquired by either Switzerland or the Principality of Liechtenstein must be discharged in Swiss currency within a period of 14 days at latest after the acceptance of the accounts.

CHAPTER VIII.

FINAL RESOLUTIONS.

ART. 19.—(1) The present Convention will be ratified and will come into force after the exchange of the documents of ratification. It can be published on the 1st of January or the 1st of July of the civil year, subject to six months' notice.

(2) Modifications can be incorporated in the present Convention by mutual consent without formal announcement.

(3) The Swiss postal administration and the Swiss telegraphic and telephone administration will decree the working arrangements necessary to the present Convention.

ART. 20.—In case of disagreement on the subject of the interpretation of the present Convention, the question in dispute shall be submitted to an arbitration tribunal should it be found impossible to settle the matter by diplomatic means. In this case each of the contracting parties shall choose an arbitrator. If the two arbitrators should not agree they will themselves appoint a referee or umpire.

In testimony whereof, the plenipotentiaries have signed the present Convention and have thereto set their seal.

Executed in duplicate, at Berne, the 10th day of November, 1920.

(L.S.)	(Signed)	MOTTA.
(L.S.)	(Signed)	BECK.

Certifies that the above Convention is ratified and has the force of law in all its parts, promising, in the name of the Swiss Confederation, to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the President and the Chancellor of the Swiss Confederation, and furnished with the federal seal.

Executed thus, at Berne, on the 28th January, 1921.

In the name of the Swiss Federal Council.

(L.S.)	SCHULTHESS,
	<i>The President of the Confederation.</i>
(L.S.)	STEIGER,
	<i>The Chancellor of the Confederation.</i>

Certifies that the above Convention is ratified and has the force of law in all its parts, promising, in the names of the Principality of Liechtenstein, to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the head of the Government of the Principality and furnished with the State seal of Liechtenstein.

Executed thus as Vaduz on the 27th of January, 1921.

In the name of the Government of the Principality of Liechtenstein.

(L.S.)	DR. JOSEPH PEER,
	<i>The Head of the Government.</i>

N.B.—The exchange of the documents of ratification took place at Berne on the 31st of January, 1921, and the Convention, in accordance with the Article 19 above, came into force on the 1st of February, 1921.

LITHUANIA

(See also Map Section)

LITHUANIA (Lietuva) became a Grand Duchy in the early part of the 13th century and after subjugation by Poland and Russia in 1918, again became an Independent State. It has an area of 59,633 square miles with a population of 4,800,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relative to wireless in Lithuania.

LUXEMBOURG

(See also Map Section)

THIS small Grand Duchy lies roughly about 150 miles from the nearest sea coast, and is bounded on the east by Germany, on the south by France, and on the west by Belgium. It is governed by a Chamber of Deputies. Its total area is about 999 square miles, and it possesses a population of about 263,824.

ORGANISATION.

A receiving wireless telegraph station has been erected by the State at the capital city of Luxembourg, with the object of receiving daily French Official Time and Meteorological information.

ADMINISTRATION.

No law fixing conditions under which wireless apparatus may be installed is in existence, although a certain number of amateurs are in possession of receiving apparatus.

The Grand Duchy of Luxembourg has not adhered to the London Radiotelegraphic Convention; it has, however, made a declaration to the Berne Bureau in accordance with Article 48 of that Convention.

MACAO

(See also Map Section)

SITUATED in China, on an island of the same name and two adjacent islands (Taipa and Colôave), at the mouth of the Canton River, this Colony belongs to Portugal. It has an area of four square miles and a population of 74,866.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in the colony.

MADAGASCAR

(See also Map Section)

Including: Mayotte and the Comoro Islands, Réunion.

MADAGASCAR is a French colony under a Governor-General. It is situated to the south-east of the coast of Africa, and has an area of 228,000 square miles with a population of 3,545,264.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in the colony. A reference however, is to be found under France and Algeria.

MALAY STATES

(See also Map Section)

Including Johore, Kedah, Perlis, Kelantan and Trengganu.

THE Malay States, not included in the Federation (Federated Malay States), are under British Protection, being transferred from Siam to Great Britain on March 10th, 1909. Their total area is 23,170 square miles with a population of 1,083,173.

CONTROL AND ORGANISATION.

There are at present no wireless stations in these States, and consequently no radiotelegraphic enactments.

MALTA

(See also Map Section)

Including Gozo.

THIS island forms the headquarters of the British Mediterranean Fleet and the principal coaling station for merchant vessels, as well as the Navy, in the Mediterranean. The language of the people is a corrupt dialect of Arabic. The Knights of St. John, who possessed the island from 1530 to 1798, raised the stupendous fortifications which rendered Malta so long militarily formidable. The island was finally recognised as a British dependency by the Congress of Vienna in 1814, and is ruled by a Governor, assisted by an Executive Council and a "Council of Government." In 1920 a partial measure of home rule was adopted. It has an area of 118 square miles, and a population of 228,534.

CONTROL AND ORGANISATION.

The administration of wireless telegraphy in Malta and its dependencies is under Naval control. There are three stations, one of which is open for public service to ships.

ADMINISTRATION.

Wireless telegraphy in the Colony is administered under the provisions of Telegraph Ordinances. Regulations under these Ordinances have been made by His Excellency the Governor. Two draft Ordinances for Wireless Telegraphy are expected to be promulgated by the end of 1922, and are printed below.

A—Government Notice No. 258 of December 24th, 1909.

B—Section 28, Malta Defence Regulations.

C—Ordinance to Control Wireless Telegraphy on Ships.

D—Ordinance to Control Wireless Telegraphy.

GOVERNMENT NOTICE, No. 258.

A It is hereby notified for general information, that His Excellency the Governor, in exercise of the powers vested in him by Article 41 of Ordinance No. I of 1904, as amended by Ordinance No. III of 1909, has been pleased to make the following regulations respecting the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these Islands.

By command, E. P. S. ROUPELL,
Acting Lieutenant-Governor and Chief Secretary to Government.

Lieut.-Governor's Office, The Palace, Valetta,
December 24th, 1909.

REGULATIONS RESPECTING THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS, WHETHER BRITISH OR FOREIGN, WHILE IN THE TERRITORIAL WATERS OF MALTA AND ITS DEPENDENCIES.

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of these Islands shall be worked in such a way as not to interfere with—

(a) Naval signalling; or

(b) the working of any wireless telegraph station lawfully established, installed or worked in these Islands or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of these Islands, except with the special or general permission in writing of the Lieutenant-Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

SECTION 28, MALTA DEFENCE REGULATIONS.

B PROHIBITION AGAINST POSSESSION OF WIRELESS TELEGRAPHIC APPARATUS, ETC.

No person shall, without the written permission of the Governor, make, buy, sell, or have in his possession or under his control any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus; and no person shall sell or give any such apparatus to any person who has not obtained such permission as aforesaid, and any person having in his possession or under his control any such apparatus, whether with or without the

permission of the Governor, shall on demand deliver the apparatus to the Governor, or as he may direct; and if any person contravenes the provisions of this regulation he shall be guilty of an offence against these regulations.

Where it appears to the Governor that there are reasons to suspect that any person having in his possession any apparatus for sending or receiving messages by telegraphy, wireless telegraphy, telephony or other electrical or mechanical means is using or about to use the same for any purpose prejudicial to the public safety or the defence of these Islands, he may, by order, prohibit that person from having any such apparatus in his possession, and may take such steps as are necessary for enforcing the order, and if that person subsequently has in his possession any apparatus in contravention of the order, he shall be guilty of an offence against these regulations.

For the purpose of this regulation, any apparatus ordinarily used as a distinctive component part of apparatus for the sending or receiving of messages by wireless telegraphy shall be deemed to be intended to be so used unless the contrary is proved.

Any person possessing private telephone installations or any apparatus capable of being used for transmitting telephone messages shall give notice to the Superintendent of Police of any such installation or apparatus, and if he fails to do so he shall be guilty of a summary offence against these regulations.

C The following draft Ordinance to control wireless telegraphy on ships which His Excellency the Governor proposes to issue under Section 12 of the Letters Patent constituting the Office of Governor and Commander-in-Chief is published for general information in conformity with section 3 (5) of His Majesty's Instructions to the Governor of Malta dated 14th April, 1921.

ORDINANCE No.

AN ORDINANCE ENACTED BY THE GOVERNOR OF MALTA IN THE EXERCISE OF THE POWERS CONFERRED UPON HIM BY HIS MAJESTY'S LETTERS PATENT DATED THE 14TH OF APRIL, 1921, CONSTITUTING THE OFFICE OF GOVERNOR AND COMMANDER-IN-CHIEF OF MALTA.

To Control Wireless Telegraphy on Ships.

Whereas Wireless Telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient for the peace, order and good government of Malta that provision be made therefor so far as ships registered in Malta are concerned:

It is enacted by the Governor as follows:—
ART. 1. This Ordinance may be cited as "The Merchant Shipping Wireless Telegraphy Ordinance, 1922."

2. Every seagoing British ship registered in Malta being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Ordinance, and shall be provided with at least one or more certified operators and watchers, in accordance with such rules.

3. The Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

4. The Governor shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade and qualifications of the operators and watchers to be carried. Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

5. A surveyor of ships or a wireless telegraphy inspector appointed by the Governor may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and with any rules from time to time made thereunder, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in writing to the Collector of Customs, and any ship which may seek to obtain a clearance or transire shall be detained until a certificate under the hand of any such surveyor or inspector is produced by the Master of the ship to the Collector of Customs to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and with any rules from time to time made thereunder.

6. If the provisions of the foregoing articles of this Ordinance or of any rules from time to time made thereunder are not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted before the Court of Magistrates of Judicial Police.

7. The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Merchant Shipping (Convention) Act, 1914.

8. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Malta, apply to ships other than British ships registered in Malta while they are within any port in these Islands in like manner as they apply to British ships so registered.

9. In this Ordinance the expression "passenger steamer" means a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed by the Governor for the purpose mentioned in Section 5 of the Ordinance.

EDW. R. MIFSUD,

Clerk of the Nominated Council.

March 17th, 1922.

D The following draft Ordinance to control Wireless Telegraphy which His Excellency the Governor proposes to issue under Section 12 of the Letters Patent constituting the office of Governor and Commander-in-Chief is published for general information in conformity with Section 3 (5) of His Majesty's Instructions to the Governor of Malta dated 14th April, 1921.

ORDINANCE No.

AN ORDINANCE ENACTED BY THE GOVERNOR OF MALTA IN THE EXERCISE OF THE POWERS CONFERRED UPON HIM BY HIS MAJESTY'S LETTERS PATENT DATED THE 14TH OF APRIL, 1921, CONSTITUTING THE OFFICE OF GOVERNOR AND COMMANDER-IN-CHIEF OF MALTA.

To Control Wireless Telegraphy.

Whereas Wireless Telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient to make a law with regard to the possession of wireless telegraphic apparatus:

Be it enacted by the Governor as follows:—

ART. 1. This Ordinance may be cited as "The Wireless Telegraphy Apparatus Ordinance, 1922."

2. No person shall, without the written permission of the Governor, make buy, sell, or have in his possession or under his control any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus; and no person shall sell or give any such apparatus to any person who has not obtained such permission as aforesaid, and any person having in his possession or under his control any such apparatus, whether with or without the permission of the Governor, shall on demand deliver the apparatus to the Governor, or as he may direct; and if any person contravenes the provisions of this article he shall be guilty of an offence against the law.

3. The Governor may annex to any written permission as aforesaid such terms or conditions as he thinks fit and upon the breach of any such terms or conditions the person committing such breach shall be guilty of an offence against this law.

4. For the purpose of this law, any apparatus ordinarily used as a distinctive component part of apparatus for the sending or receiving of messages by wireless telegraphy or telephony shall be deemed to be intended to be so used unless the contrary is proved.

5. A person committing an offence against this law shall, on conviction, be liable to a fine not exceeding £50; and on a second or further conviction, to a fine not exceeding £100 or to imprisonment for a period not exceeding 3 months or to both such imprisonment and fine; and on conviction of a first or other offence against this law the Court may, and on the recommendation of the Governor shall, declare the permission given to the person convicted to be cancelled and order the apparatus to be delivered up to the Commissioner of Police.

6. In this Ordinance, "Wireless Telegraphy" means any system of communication by means of electric signals or telephony without the aid of any wire connecting the points from and at which the messages or communications are sent or received.

EDW. R. MFSUD,

Clerk of the Nominated Council.

March 10th, 1922.

MARSHALL ISLANDS

(See under PACIFIC ISLANDS (JAPAN)).

MARTINIQUE

(See also Map Section)

A COLONY of France, Martinique has an area of 385 square miles and a population of 244,439. It is under the administration of a Governor, assisted by a General Council.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in the colony. A reference however, is to be found under France and Algeria.

MAURITIUS

(See also Map Section)

MAURITIUS lies in the Indian Ocean, 500 miles east of Madagascar and comprises a total area of about 720 square miles, with a population of 376,108.

The Colony was formerly ceded to Great Britain by the Treaty of Paris of 1814. Under letters patent of 1885, 1901, 1904, and 1912 partially representative institutions have been granted. The Administration of the Colony and its dependencies is vested in a Governor, assisted by an Executive Council and a Council of Government.

CONTROL AND ORGANISATION.

The wireless station of this colony has been closed down since July, 1920, but negotiations are in progress for the maintenance of a station to suit the needs of the colony.

ADMINISTRATION.

The legislation affecting Wireless Telegraphy in Mauritius was originated by an Ordinance (No. 33) issued in 1903 investing the Governor with certain administrative powers. This was amended by the "Wireless Telegraphy" (Amendment) Ordinance (No. 25) of 1912. These have since been consolidated by Ordinance No. 11 of 1913, and three sets of Regulations have been framed thereunder, as follows:—

- A—Ordinance No. 11 of August 22nd, 1913 (to Consolidate the Laws on Wireless Telegraphy).
- B—Regulations framed under Ordinance No. 11 of 1913 (Art. 4) (August 22nd, 1913).
- C—Additional Regulations respecting the transmission of messages by Wireless Telegraphy.
- D—Regulations governing the transmission of messages by Wireless Telegraphy through Rose Belle Station to and from Merchant Ships at sea.

ORDINANCE No. 11.

August 22nd, 1913.

A Be it Enacted by the Governor, with the advice and consent of the Council of Government, as follows:—

1. *Definition of "Wireless Telegraphy."*—In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *License for "Wireless Telegraphy."*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus aboard ships.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. *Regulations.*—(1) The Governor in Executive Council may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station, has been established

without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any police officer or any person appointed in that behalf by the Inspector-General of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable to a fine not exceeding five hundred rupees (Rs. 500) and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

7. *Repeal Clause.*—Ordinances No. 33 of 1903 and 25 of 1912 are repealed.

8. *Short Title.*—This Ordinance may be cited as "The Wireless Telegraphy (Amendment) Ordinance, 1913."

Passed in Council at Port Louis, Island of Mauritius, this twenty-ninth day of July, One thousand nine hundred and thirteen.

B REGULATIONS FRAMED UNDER THE WIRELESS TELEGRAPHY ORDINANCE No. 11 of 1913 (ARTICLE 4).

1. Apparatus for wireless telegraphy on board a merchant ship shall not be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. Apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall not be worked in such a way as to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and

wireless telegraph stations established on ships at sea.

3. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether on shore or on any ship.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Any person who shall offend against any of these Regulations shall be liable to a fine not exceeding five hundred rupees (Rs. 500), and any apparatus for wireless telegraphy in connection with which the offence was committed may be seized and forfeited.

8. The Regulations published under Government Notification No. 19 of January 25th, 1913, are hereby repealed.

Made by His Excellency the Governor in Executive Council at a meeting held on August 22nd, 1913.

C ADDITIONAL REGULATIONS RESPECTING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE NO. II OF 1913.)

1. Telegrams for transmission to ships at sea will in all cases be held at the Wireless Station until the ship in question arrives within range, *i.e.*, telegrams will not be transmitted to a ship which is approaching the Island until she has called the wireless station for the first time.

2. In the case of a ship going away from the Island the telegram will be transmitted immediately on receipt at the wireless station

unless she is known to have already passed out of range. In this case and in all cases where the transmission of the telegram by wireless proves to be impossible, the sender will be informed by service advice from the post office at which he handed in his telegram, and will be refunded the wireless charges.

Made by the Governor in Executive Council at a meeting held on the twenty-sixth day of December, 1913.

D REGULATIONS GOVERNING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY THROUGH ROSE BELLE STATION, TO AND FROM MERCHANT SHIPS AT SEA.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE NO. II OF 1913.)

1. Messages received by wireless telegraphy from merchant ships at sea will be handed in at Rose Belle Post Office by an officer or agent of the wireless station and will be transmitted to any of the telegraph offices of the Colony for delivery to the addressee subject to the following conditions and charges:—

(a) A terminal charge will be made at the rate of R. 0.02 cents. of a rupee per word.

(b) The usual end portage charges from the post office of destination to the addressee will be made.

2. Messages for transmission to merchant vessels at sea will also be accepted at any of the telegraph offices in the Colony subject to the following conditions and charges:—

(a) The charge for messages shall be at the rate of 62 cents. of a rupee per word.

(b) The charge for portage from Rose Belle Post Office to the wireless station shall be 50 cents. of a rupee.

(c) Every message shall bear the supplementary word "wireless" for which a charge of 2 cents. of a rupee will be made.

3. The rules and regulations for the acceptance and transmission of messages by wireless telegraphy shall be in accordance with the rules and regulations of the Mauritius Post Office and Telegraphs for the time being in force.

4. Messages in code will not be transmitted or received by wireless telegraphy.

5. Regulations published under Government Notices No. 94 of 31st May, 1919, and No. 47 of 25th February, 1920, are repealed.

Made by the Governor in Executive Council, at a meeting held on the ninth day of July, one thousand nine hundred and twenty.

MESOPOTAMIA (IRAQ)

(See also Map Section)

MESOPOTAMIA (Iraq) was conquered by Indian and British troops during the Great War, Baghdad being occupied on March 11th, 1917. In the Treaty of Peace with Turkey it was recognised as an independent state, with King Feisal at its head.

A Treaty of Alliance between Great Britain and Iraq was provisionally signed on October 10th, 1922, by which Great Britain will assist King Feisal's Government in all matters political, civil and military, for a period of 20 years.

CONTROL AND ORGANISATION.

In 1915 the Indian Telegraph Department erected a 3-kW. Marconi station at Basra, and in 1917 a 30-kW. Marconi installation was constructed at the same place. These and other small stations (since dismantled) in Mesopotamia were worked by the military authorities, but in 1921 the Basra installations were taken over by the Civil Administration in Mesopotamia.

MEXICO

(See also Map Section)

THE Republic of Mexico occupies an important position in the southern part of the continent of North America, and is bounded on the north by the United States of America, and by Guatemala and British Honduras on the south. It lies approximately between 15° and $30^{\circ} 30'$ north latitude and 87° and 117° longitude east of Greenwich. With a President at its head, it is divided into 28 states, two provinces (territorio), and a federal district.

CONTROL.

The wireless service is worked exclusively by the Federal Government, presided over by the Secretariat of Communications and Public Works. The direct control is in the hands of the Technical Department of the Dirección General de Telégrafos Nacionales.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Amado Aguirre, Engineer ..	Secretary of Communications and Public Works	Mexico,
Ricardo C. López ..	Director-General of National Telegraphs	Mexico.
Carlos Islas Bustamante ..	Chief of the Electro-technical Department	Mexico.

ORGANISATION.

Private installations are allowed on the conditions established by the Dirección General de Telégrafos Nacionales authorised by the Secretariat of Communications and Public Works as long as the Decree promulgated on October 19th, 1916, is not violated. The radiotelegraphic stations open for public service to ships are fourteen in number, in addition to which we may include the installation which was recently completed at the port of Salina Cruz.

There are at present no radiotelegraphic arrangements in connection with aviation. Time and weather signals combined with "Shipping Advice" services are sent out from the coastal wireless stations daily.

The following are the particulars relating to radiotelegraphic stations :—

Radio Land Stations.

Pacific Coast	8
Mexican Gulf Coast	8
Interior	10

Radio Ship Stations.

Merchant ships	11
Naval ships	8
Lighthouse guard ship	1

ADMINISTRATION.

National Radiotelegraphic Laws are being drawn up. The only extant decree relative to radiotelegraphy runs as follows :—

A—Decree of October 19th, 1916.

B—Use of Wireless Apparatus at the Port of Tampico.

A ART. I.—The establishment and exploitation of Radiotelegraphic Stations is forbidden in the Mexican Republic except under the express authorisation of the Federal Government, which can only accord it on the terms and under the conditions which are contained in the Regulations attached to the said Law.

ART. II.—Anyone who without the authorisation of the Federal Government establishes

a Radiotelegraphic Station shall be liable to a penalty of 500-1,000 pesos, or imprisonment from 1 to 11 months, or shall suffer a combination of both penalties in accordance with the seriousness of the offence. Moreover, all apparatus, machines, and accessories forming part of the installation shall be sequestered for the benefit of the State.

ART. III.—If any corporation which installs a Radiotelegraphic Station be a company or

any other responsible body, direct responsibility with regard to the infraction of this law is vested in the person of the directors, agents or administrators.

ART. IV.—Any persons who make use of a Radiotelegraphic Station installed without the authorisation of the Federal Government shall be liable to a punishment of half the penalty enacted in ART. II preceding.

ART. V.—Any persons who make use of a Radiotelegraphic Station without the authorisation of the Federal Government, or who intercept a communication between Public Departments, or who divulge its contents, shall be liable to the penalty which is contained in ART. 770 of the Penal Code of the Federal District.

ART. VI.—This Law enters into operation from the date of its publication.

B In accordance with Article 8 of the London Convention, which requires that "The working of radio stations shall be organised as far as possible so as not to disturb the working of other radio stations," and

Article XLVI, Service Regulations affixed to the International Radiotelegraphic Convention of 1912, which requires that "The exchange of correspondence between shipboard stations shall be carried on in such a manner as not to interfere with the service of the coastal stations, the latter, as a general rule, being accorded the right of priority for the public service."

It is notified that American vessels when anchored in the port of Tampico, must not engage in the transmission of wireless messages to other American ships and to coastal stations in the United States at all times. Certain hours have been set apart for this purpose so as not to inconvenience Mexican stations at or near Tampico, and it has been requested that such vessels, while in the port of Tampico, confine their wireless operations to the hours specified for that purpose by the Mexican authorities.

Operators on ships arriving at Tampico should ascertain from the Mexican Radio Station at that port (XAJ) during what hours they may use their transmitter while at anchor in the harbour.

MONACO

(See also Map Section)

MONACO is situated on the Mediterranean and surrounded by the Alpes Mountains. It is a department of France, but a Principality with Prince Louis, the reigning monarch.

ADMINISTRATION.

There is no commercial wireless telegraphy and telephony in the State. Private installations are regulated by the decree printed below.

A—Decree ruling the conditions of the establishment and use of radiotelegraphic apparatus designed solely to receive time and meteorological telegrams.

ORDER.

A We, Ministers of State of the Principality

Considering the agreement between the Government of the Principality and the French Government, resulting in an exchange of letters on April 12th, 1921.

Considering the deliberations of the Government Council on March 19th, 1921, and March 8th, 1922.

WE DECREE.

The conditions ruling the establishment, use and employment, are fixed as follows by such persons in the Principality of the radiotelegraphic stations designed solely to receive time signals and meteorological telegrams.

ART. 1.—Applications for licenses must be addressed to the Minister of State. The application must indicate the precise spot where the station will work and furnish a description of the apparatus employed.

ART. 2.—The license is granted by the Minister of State.

ART. 3.—The receiving stations endorsed in Article 1 can only be used for the receipt of time signals and meteorological telegrams. All transmission of signals is formally prohibited.

ART. 4.—The contents of the radiotelegrams, other than meteorological ones, which would eventually be collected by the authorised receiving stations, must not be written down nor made known to anyone outside the officials appointed by the Administration, or of competent legal police-officers.

No use whatever shall be made of these telegrams.

ART. 5.—The Administration reserves the right to subject the receiving stations to such control as seems proper.

ART. 6.—The State will be under no responsibility on account of the use of the receiving stations of wireless telegraphy, concession for which has been granted.

ART. 7.—The concessionaires must notify the Minister of State of any modification which they propose to adopt in the installation of their station.

The Administration can, moreover, at any time, and for whatever reason, suspend or revoke the granted permissions, without having to pay any indemnity whatever or making known any motive for their decision.

These licenses carry no privileges, and cannot be made an obstacle to any similar licenses granted subsequently to any other petitioner whatever. They cannot be transferred to a third party without the express consent in writing of the Administration.

At the first application of the Administration, each licensee must immediately place his station out of working order.

ART. 8.—The licensee must submit to all customary or fiscal arrangements resulting from the laws, rules and regulations which may happen to occur in the affairs of establishment or use of the wireless telegraphy stations.

ART. 9.—The licensee must pay a statistical fee fixed at 10 francs per annum, and for each authorised receiving station.

ART. 10.—The cost of stamps applied to the acts relating to the license of time signal stations are to be borne by the licensee.

ART. 11.—The present order shall be deposited at the General Secretary's Office of the Minister of State, to notify whom it may concern.

ART. 12.—The Counsel to the Government for Public Works and Miscellaneous Affairs is charged with the execution of the present Order.

Executed at Monaco, at Government House, March 24th, 1922.

R. LE BOURDON,

Minister of State.

MOROCCO

(See also Map Section)

KNOWN to the natives as "Maghreb-el-Aksa" (the farthest west), Morocco is an empire sometimes spoken of as the Mauritanian Quadrilateral. It lies in North West Africa between Algeria on the east and the Atlantic Ocean on the west, and is bounded on the north by the Mediterranean and on the south by the Sahara Desert. Mulai Yusef, G.C.M.G., was proclaimed Sultan in 1912. By the Conference of Algeciras, held in 1906, France and Spain agreed to organise the police force and customs of the coast towns, whilst the internal government of the country lies mainly in the hands of the Sultan and his advisers. The total area is about 231,500 square miles, of which 10,000 square miles in under Spanish control. The combined total population is about 6,000,000.

(a) FRENCH ZONE.

CONTROL.

The present arrangements are as follows:—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
M. le Colonel Appiano ..	Directeur du Service des Transmissions ..	Résidence Général Rabat.
M. Walter	Directeur de l'Office des Postes Télégraphes et Téléphones	Résidence Général Rabat.

The Directeur du Service des Transmissions at the Residency General is in control, through a controlling station at the Residency General, of all wireless telegraph stations, Civil, Military, and Naval, in the French zone.

N.B.—This control station is not the same as the Rabat Station CNF which is now abolished.

ORGANISATION.

The question of establishing wireless telegraph stations in Morocco first arose in 1906, when the Shereefian Government decided to erect several stations. A company was formed at Tangier, called the Société Internationale de la Télégraphie Sans Fil, which received the concession to install the service. Its director was M. Henri Popp, a French engineer. The company did not exist long, however, for in 1908 the Shereefian Government bought it out, M. Popp remaining as manager and chief engineer.

The first stations to be established were Tangier and Casablanca, in 1907. Next came Rabat, in 1908, and Mogador at the end of the same year.

In 1910 M. Popp died, and was succeeded by M. Biarnay, under whose direction the Fez station was established during the summer and autumn of 1911. Since then the Shereefian Government has created no further stations. The French Military Authorities, however, have stations all over the French Zone, including one at Agadir. Portable military wireless telegraphy installations have been in use by French mobile columns since 1911.

The present organisation consists of the Shereefian Government stations at Tangier and Casablanca. These are for public use, the stations at Féz, Mequinez, Marrakech, Agadir, and others, being solely for military use. The station at Mediuna is to be used only for the transmission of public and official urgent (triple paid) messages.

The various military and civil posts all over Morocco (French Zone) keep the Service des Communications at the Residency General informed of meteorological conditions at their several posts, and the Service des Transmissions also receives the Eiffel Tower, Madrid, Algiers, etc., news, and hands it on to the Aviation Militaire and the Service Météorologique, which is on the aviation ground at Rabat.

A powerful "post" is under consideration to be constructed by the Civil Office, for civil aviation or postal service,* and direction finding stations are to be installed during 1923 for ship services.

ADMINISTRATION.

Wireless telegraph forms a Government monopoly.

Military wireless telegraph stations keep headquarters at Rabat informed as regards meteorological conditions for the use of the military Aeronautical Bureau.

The current Laws and Regulations governing wireless telegraphy consist of the Radiotelegraphic Convention of London, 1912.

No licenses are given, and legislation for the grant of licenses for working wireless telegraphy will not be undertaken.

In principal the French Laws and Regulations also apply to Morocco.

(b) SPANISH ZONE.

CONTROL AND ORGANISATION.

The first wireless telegraph station installed in the Spanish Zone was that of Melilla (call letters EGB), erected in July, 1918.

At the present time there are in existence the following stations: Melilla (EGB), erected in July, 1918; Ceuta and Tetuan (EGD and EGK respectively), put up in July, 1911, and July, 1914, and Larache (EGF), in December, 1911.

The officers in command of these stations are as follows:—

Official.	Title.	Address.
Don Andres F. Mulere ..	Major of Engineers	Melilla.
Don Juan Reig y Valerino ..	Major of Engineers	Ceuta and Tetuan.
Don Francisce L. Trejo ..	Captain of Engineers	Larache.

These are the only permanent wireless stations in the Spanish Zone. They are all under the jurisdiction of the Ministry of War, and are controlled by the Centro Electro-tecnico y de Comunicaciones (Engineers).

ADMINISTRATION.

Existing arrangements as regards meteorological information are the same as those for Spanish Stations, the Madrid Station being in charge of this service.

The Regulations governing these stations are the same as for Spain, and licenses are given by the Centro Electro-tecnico y de Comunicaciones after the necessary examinations.

MOZAMBIQUE (Portuguese East Africa)

(See also Map Section)

PORTUGUESE East Africa comprises three district entities—(a) The Province of Mozambique, (b) the Companhia di Moçambique, and (c) the Companhia do Nyasa.

The combined area of the colony is 426,712 square miles, with a population of 3,120,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain information relating to wireless in any of the divisions of the colony.

* Our information does not definitely state which.

NEPAL

(See also Map Section)

NEPAL is an independent Kingdom in the Himalayas, bounded on the north by Tibet, the east by Sikkim, and on the south and west by British India. The reigning sovereign is the Mahárájadhírája *Tribhubana Bir Bikram Jung Bahádur Shah Bahádur Shumshere Jung*, who succeeded his father in 1911. The area of this Gurkha state is 54,000 square miles, with a population of 5,600,000.

CONTROL AND ADMINISTRATION.

At present there are no wireless stations and no legislation to provide therefore, but a project is under consideration which it is expected will mature in some three or four years' time.

NETHERLAND INDIES

(See under DUTCH EAST INDIES).

NETHERLANDS

(See under HOLLAND.)

NEW BRITAIN

(See under NEW GUINEA.)

NEW CALEDONIA

(See also Map Section)

Including : New Hebrides, Loyalty Islands, The Isle of Pines, The Wallis Archipelago, The Huon Islands, Futuna and Alofi.

NEW CALEDONIA is under the administration of a Governor assisted by a Privy Council. The seat of administration is Nouméa, the capital.

NEW HEBRIDES

The New Hebrides consist of four groups of islands, the Banks, Torres, Central, and Southern, lying between 12° and 20° south latitude and 165° and 170° east longitude. The four groups, which have an estimated area of 5,500 square miles, and a population of 60,000, comprise some 50 to 60 islands, large and small, of which the largest are Santo (Espiritu Santo), Malekula, and Efate. The islands are administered by a Condominium established under a Convention between Great Britain and France, signed on October 20th, 1906, each country being represented by a Resident Commissioner. The seat of Government is at Vila, in the island of Efate. The laws of the two nations apply to their respective nationals in the group, as also such joint regulations as may be passed by the Resident Commissioners, or the High Commissioners for Great Britain and France under the authority of the Convention referred to. Natives are subject to regulations similarly enacted.

CONTROL AND ORGANISATION.

An agreement was arrived at in 1913 between the British and French Governments to establish a wireless telegraph station in the New Hebrides at the joint expense of the two Governments. In March, 1915, a contract was entered into with the Société Française Radio-électrique for the erection of such a station at Vila on the island of Efate. In October, 1915, the engineer and operator, together with the material, arrived at Vila, and on September 1st, 1916, the installation was completed, and the station opened to the public.

Wireless telegraphy in the New Hebrides is practically a State monopoly. No provision is made for licenses for private installations, which are prohibited, except with the permission of the administration. The Resident Commissioners are responsible for the control of radiotelegraphic activity in the islands. The only station at present is the land station of Vila, which is directly controlled by Government and is open for public service to ships.

There are no firms or companies engaged in the manufacture of wireless apparatus, and no wireless societies or clubs. No aviation radio stations exist. A meteorological message is sent out daily to Fiji.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
The British and French	Resident Commissioners	Vila
Mr. J. Copie	Officer in Charge and Chief Operator	Vila
Mr. M. A. Prudence	Assistant Operator	Vila

ADMINISTRATION.

Two joint regulations affecting wireless telegraphy have been issued by the Condominium Administration, the first dated January 7th, 1909, No. 1, "The Wireless Telegraph Regulation, 1909," the other the "Wireless Telegraph (Ships) Regulation, No. 3, of 1916."

The texts of these appear below:—

A—Regulation dated 1909.

B—Wireless Telegraph (Ships) Regulation, 1916.

A JOINT REGULATION TO REGULATE THE INSTALLATION OF WIRELESS TELEGRAPHY IN THE NEW HEBRIDES.

A 1. From the date of the passing of this regulation it shall be unlawful for any person to use or establish in any of the islands of the New Hebrides, including the Banks and Torres Islands, any apparatus or installation for the purpose of electrical communication by wireless telegraphy without a license first obtained from the Resident Commissioners conjointly such license to be granted on such terms and conditions as the Resident Commissioners aforesaid may from time to time determine.

2. Any person offending against the provisions of the preceding section or failing to comply with the terms and conditions of a license when granted by the Resident Commissioners under the provisions of this regulation shall be liable to a penalty not exceeding twenty pounds and to forfeit any apparatus used or established for the purpose aforementioned.

3. Offences against this regulation shall be justiciable by the Joint Court contemplated by the tenth Article of the Anglo-French Convention of the twentieth day of October, one thousand nine hundred and six, and pending the establishment of such court by the court of the nation to which or to whose legal system the accused may belong.

4. This regulation may be cited as "The Wireless Telegraph Regulation, 1909."

Published and exhibited at the Public Offices of the Resident Commissioners for His Britannic Majesty and for the French Republic this seventh day of January in the year one thousand nine hundred and nine.

A JOINT REGULATION TO CONTROL THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT VESSELS IN THE NEW HEBRIDES.

B 1. From the date of the passing of this regulation all apparatus for wireless telegraphy on board merchant ships in the territorial waters of the New Hebrides shall be worked in such a way as not to interfere with:

(a) Naval signalling;

(b) The working of any wireless telegraph station lawfully established, installed or worked in the New Hebrides or the territorial waters thereof; and

(c) The transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraph on board a merchant ship shall be worked or used while the ship is in any of the harbours of the New Hebrides except with the joint special or general permission of the Resident Commissioners.

3. The Resident Commissioners shall have power to issue such further rules as to them may seem expedient for the control of wireless telegraphy on merchant vessels and for the censorship of messages transmitted from such vessels while in the territorial waters of the Group.

4. Any infraction of this regulation shall be punishable by the Joint Court with a money penalty of from one to twenty pounds and imprisonment for one day to one month or with one or other of these penalties.

5. This regulation may be cited as the "Wireless Telegraph (Ships) Regulation, 1916."

Published and exhibited in the Public Offices of the Resident Commissioners for Great Britain and the French Republic, at Vila, in the New Hebrides, this 30th day of October, 1916.

NEWFOUNDLAND AND LABRADOR

(See also Map Section)

THE Island of Newfoundland lies between $46^{\circ} 37''$ and $52^{\circ} 39''$ north latitude; its longitude stretching from $52^{\circ} 35''$ to $59^{\circ} 25''$ west. Its north-western side is bounded by the Gulf of St. Lawrence, whilst the Straits of Belle Isle divide it from the North American Continent.

Newfoundland ranks as the oldest British Colony, having been formally occupied by Sir Humphrey Gilbert in August, 1583. A Governor was first appointed in 1728, and in 1855 "Responsible Government" was accorded.

The Executive is vested in a Governor aided by an Executive Council. Dependent on Newfoundland is Labrador, the most easterly part of the American continent. The combined area of the two is 162,734 square miles, with a population of 267,330.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Hon. Mr. R. A. Squires, K.C., LL.B. ..	Prime Minister and Colonial Secretary ..	St. John's
Hon. Mr. W. F. Coaker	Minister of Marine and Fisheries ..	do.
Hon. Mr. W. W. Halfyard	Minister of Posts and Telegraphs ..	do.
Hon. Mr. Arthur Mews, C.M.G. ..	Deputy Colonial Secretary ..	do.
Mr. H. W. Le Messurier, J.P., C.M.G. ..	Deputy Minister of Customs ..	do.
Mr. Campbell	Secretary & Inspector Post Office ..	do.

Mr. H. W. Le Messurier, C.M.G., the Deputy Minister of Customs, refuses clearance to any vessels of Newfoundland Register not licensed in conformity with the Acts, or whose operators are not in possession of provisional service certificates issued by the Minister of Posts.

ORGANISATION.

The Colony is proud of its association with the first wireless message flashed across the Atlantic. This was received by Senatore Marconi himself on Signal Hill, an eminence overlooking the narrows of St. John's. Newfoundlanders hope that ere long some suitable memorial may be erected on Signal Hill of this epoch-making event.

In 1906 an agreement was made under which the Marconi Wireless Telegraph Company of Canada undertook to operate all the Labrador stations during the fishing season of each year, the Newfoundland Government to pay the company an annual royalty, and the revenue accruing from this traffic to go to the company, who further agreed to forward all traffic over the Newfoundland Government Postal Telegraph System.

The success of this arrangement prompted the Government to propose an extension of the system on the Labrador Coast by two or more stations—the Marconi Company to erect and operate the stations under the terms of the agreement. In the summer of 1913 stations were accordingly erected by the Marconi Company at Cape Harrison and Makkovik. In 1911 it was agreed to establish a station between Indian Harbour and Cape Harrison to complete the chain on the Labrador Coast.

After further negotiations, an important agreement was concluded in December, 1912, which covers the following points: The old agreement terminating in 1916 is extended for a further period of ten years, terminating in 1926; all other undertakings entered into in the earlier agreement will be continued until 1926. The Marconi Company has erected and is operating a station at Fogo, on the east coast of Newfoundland—this station to be the property of the Marconi Company, and to be exempt from the Government tax of \$4,000 during the currency of the agreement.

The Sealing Industry forms an important item in the industrial activities of the Colony, and the disaster of 1914 (wherein the *Southern Cross* was lost with all hands) led to the instalment of wireless equipment on the fleet of sealers, which was made compulsory by legislation to that effect.

At the present time the following stations exist:—

Public service to ships	5
Government service only	1
Public inland traffic	9
Direction-finding service	1
Ship stations	17

ADMINISTRATION.

The general Regulation of Wireless is governed by the Posts and Telegraph Acts, 1891 to 1906.

A—Act of 1905 (Cap. VII).

B—Post and Telegraph Act, 1906.

C—Wireless Telegraphy (Steamers) Act, 1914.

D—Wireless License.

E—Provisional Certificate for Wireless Operators.

F—Amateur Experimental License.

THE ACT OF 1905, CAP. VII.

A This Act refers to taxes upon business transacted by telegraph and telephone companies within and in transit through the Colony. Clause 2, Section 2, reads as follows:—

A sum equal to one per cent. in manner hereinafter provided of the total amount received by or due to the company in respect of all telegraphic messages passing over the land lines of the company or transmitted or received by any wireless method of telegraphy to or from any place within this Colony from or to any other place within this Colony during a period of twelve calendar months ending on the first day of May of each year: Provided that this subsection shall not apply to messages which originate or are delivered in any place outside the Colony.

The first of such payments shall be made on the 30th day of June, 1906, in respect of the period of twelve months ending on the preceding first day of May.

Section 4 of the same Clause (2) reads as follows:—

A sum of four thousand dollars (\$4,000) in respect of every wireless telegraph station or other means of communication by wireless methods of telegraphy between this Colony and any place, ship or vessel outside this Colony, for the time being belonging to or worked by or on behalf of the company which now is or hereafter shall be established in this Colony.

The first of such payments shall be made on the 30th day of June, 1906: Provided that if the Governor in Council is satisfied that any such wireless telegraph station or other such means of communication is established for the purpose only of reporting passing ships or vessels, he may dispense the payment of such last-named sum and discharge the company from liability therefor in respect of such station or means of communication.

Clause 1 (1) of the Act of June 15th, 1905, Cap. XXI, reads:—

Whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony shall have control over the transmission of messages over any telegraph line, telephone line, or by any other form of telegraphy, it shall be lawful for the Governor in Council at any time to assume and for any length of time retain possession of any telegraph line, telephone,

or any form of telegraphy in this Colony, and of all things necessary for the efficient working thereof, and may for the same time require the exclusive service of the operators and other persons employed in working such telegraph line, telephone, or any form of telegraphy; and the company or other proprietor of such telegraph line, telephone or any form of telegraphy, shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders, and transmit and receive such despatches as they are required to receive and transmit by any officer duly authorised by the Governor in Council, and every company or other proprietor, operator or person violating any of the provisions of this section shall incur a penalty not exceeding one hundred dollars (\$100) for every refusal or neglect to comply with the requirements thereof, such penalty to be recovered by action in the name of the Minister of Finance and Customs, in a summary manner before a Stipendiary Magistrate or Justice of the Peace.

POST AND TELEGRAPH ACT, 1906.

B 1. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy, in any place in this Colony or on board any ship registered in this Colony, except under and in accordance with a license granted in that behalf by the Postmaster-General, with the consent of the Governor in Council.

(2) Every such license shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the license is granted, and any such license may include two or more stations, places or ships.

(3) If any person establishes a wireless telegraph station without a license in that behalf, or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour, and be liable on conviction in a summary manner before a Stipendiary Magistrate to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy

installed or worked without a license, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General.

(4) If a Stipendiary Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship as aforesaid without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) When a fine under this Act is imposed by a Court, Judge or Magistrate, and the master or owner of any ship is ordered to pay the same and the same is not paid at the time and in the manner prescribed, the Court, Judge or Magistrate making the order may, in addition to any other powers they may have for the purpose of compelling payment, direct the amount remaining unpaid to be levied by distress and sale of the ship, her tackle, furniture and apparel.

(6) The Postmaster-General may make regulations for prescribing the form and in which applications for licenses under this Act are to be made, and, with the consent of the Governor in Council, the fees payable on the grant of any such license.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Post and Telegraph Acts, 1891 to 1904," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

2. This Act shall be read with and form part of "The Post and Telegraph Acts, 1891 to 1904," and the said Acts and this Act may be cited as "The Post and Telegraph Acts, 1891 to 1906."

WIRELESS TELEGRAPHY (STEAMERS) ACT.

C The following Act respecting the provision of wireless telegraphy on steamers engaged in the trade of Newfoundland was passed on September 4th, 1914:—

1. Every steamer to which this Act applies shall be provided:—

(1) With a wireless telegraph installation approved of by the Minister of Marine and Fisheries;

(2) With at least one qualified wireless operator approved of by the Postmaster-General;

(3) With a Morse signalling apparatus approved by the Minister of Marine and Fisheries;

(4) With at least one person on board capable of operating such signalling apparatus and of reading signals from other ships.

2. The wireless telegraphy installation provided on a ship to which this Act applies shall be maintained in good order and shall be attended to by an operator qualified as aforesaid in accordance with rules and regulations to be made by the Governor in Council under this Act for the purposes thereof.

3. No steamer to which this Act applies shall receive a clearance at any Custom House for the Seal Fishery or otherwise unless and until the Collector is satisfied that the provisions of this Act in respect of said steamer have been complied with.

4. If any requirement of this Act is not complied with in the case of any steamer to which this Act applies, the master or owner shall be liable for each offence to a fine of twenty-five hundred dollars, to be recovered in a summary manner before a Stipendiary Magistrate.

5. This Act shall apply to any steamer which ordinarily is engaged in prosecuting the Seal fishery from any port of this Colony, when engaged in the Seal fishery or when carrying more than sixty persons; and to any other vessel carrying passengers from or within this Colony when named by the Governor in Council in a Proclamation to be published in the *Royal Gazette*.

6. Nothing in this Act shall affect the obligation to obtain a license for a wireless telegraphy installation under "The Postal and Telegraph Acts, 1891 to 1906," or prevent the Governor in Council or other person exercising a like control over such wireless telegraphy in times of war or otherwise as may be exercised in respect of other wireless telegraphy.

W. 19
D SHIP LICENSE No.
19....

COLONY OF NEWFOUNDLAND.

"LICENSE TO USE WIRELESS TELEGRAPHY."

Issued in accordance with the provisions of the London Convention, of 1912.

The herein named resident of is hereby licensed to establish and operate a wireless telegraph station on board the ship for the term or period commencing on the first day of April, nineteen hundred and, and terminating on the thirty-first day of March, nineteen hundred and, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar, being the license fee for the privilege above named.

This license is subject to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:

The expression "marine signalling" means signalling by means of any system of wireless telegraphy between two or more ships, between ships and shore stations and any other wireless telegraph station, or between shore stations and ships.

2. (1) The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto.

(2) No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Government of Newfoundland.

3. (1) The licensee shall so operate the licensed apparatus as not to interfere with the working of any wireless telegraph station established in

Newfoundland, or with marine signalling on the waters or territory of Newfoundland or neighbouring waters or territory.

(2) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees:

(a) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(b) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(c) Generally with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not, without the consent of the Postmaster-General, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

4. The licensee shall, if so required in writing by the Postmaster-General, cease to operate the licensed apparatus for such period (not exceeding, hours in any one day) as may be specified by the Postmaster-General.

5. Subject to the provisions of this license, and in accordance with the regulations issued from time to time by the Postmaster-General, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship without regard to the particular system of wireless telegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

6. The licensee shall not be obliged to transmit and receive commercial messages by means of the licensed apparatus to and from a ship station on a ship registered in a country which does not adhere to the International Radiotelegraphic Convention, unless instructed so to do by the Postmaster-General in his regulations.

7. (1) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Newfoundland or Canadian Government vessels), such messages shall have priority over all other messages, and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages, and the rates to be charged on such messages shall not exceed half the rates charged the ordinary public.

(2) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

8. The licensee shall, so far as possible, receive from all other stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by marine signalling or by any system of wireless telegraphy.

10. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraphic Convention, and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the head office of the licensee, in between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

11. The Postmaster-General or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

12. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose by the Postmaster-General and shall forward the same to the Postmaster-General at the end of each month.

13. (1) The licensee shall observe at the station the provisions of the International Radiotelegraphic Convention as adhered to by His Majesty in respect of the Colony of Newfoundland and the detailed regulations from time to time made thereunder for carrying such provisions into effect.

(2) The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Postmaster-General.

14. Except with the consent in writing of the Postmaster-General the licensee shall not assign or sublet this license.

15. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Postmaster-General.

Certificates shall be granted to persons of such technical proficiency, and shall be in such form and subject to such conditions as the Postmaster-General may from time to time prescribe.

16. The licensees shall carry this license on the ship on which the ship station is established under this license, and also such documents as may be prescribed by the Postmaster-General, for the purpose of enabling the licensee to communicate with coast stations in accordance with the rules and regulations of the International Radiotelegraphic Convention of Berlin, 1906.

17. (1) If, and whenever, in the opinion of the Postmaster-General or any officer in command of one of His Majesty's ships of war, an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for the said Postmaster-General, by

warrant under his hand, to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and, subject thereto, for such ordinary services as to the said Postmaster-General may seem fit, and in that event, any person authorised by the said Postmaster-General may enter upon the stations of the licensee, and take possession thereof and use the same as aforesaid.

(2) The Postmaster-General or any officer in command of one of His Majesty's ships of war may when he considers such an emergency as aforesaid to have arisen, instead of taking possession of the stations of the licensee, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly and in such manner as he may direct, and such persons may enter upon the licensee's premises accordingly, or the said Postmaster-General or officer may direct the licensee to submit to him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said Postmaster-General or officer may prescribe, and the licensee shall obey and conform to all such directions.

3. In any such case as aforesaid, if the licensee shows that during the exercise of any of the powers aforesaid, his receipts for the licensed apparatus with respect to which the said powers have been exercised have been less than his receipts from the same source during a corresponding period, the Government shall pay to the licensee, as compensation for any loss of profit sustained by the licensee by reason of the exercise by the Postmaster-General of any of the powers hereby reserved, such sum as may be settled between the Postmaster-General and the licensee by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Postmaster-General are exercised

for the purpose of preventing direct communication with any of His Majesty's enemies, and, save with the consent of the Postmaster-General no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing direct or suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Postmaster-General may, by writing revoke and determine these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General, from time to time, to establish, extend, maintain and work any system or systems of wireless telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Postmaster-General, from time to time, to enter into agreements for or to grant licenses relative to the working and user of wireless telegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of wireless telegraphy, with or to any person or persons whatsoever upon such terms as he shall, in his discretion, think fit.

20. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Postmaster-General under these presents may be under the hand of any authorised officer, for the time being, of the Newfoundland Postal Telegraph Department and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Postmaster-General, St. John's, Newfoundland.

Name of Station.	Normal Range.	Description of Receiving Apparatus.	Wave-length	Source of Power and Maximum Output.	Maximum Power taken by Transmitting Instruments.		Frequency of Alternator, if any.	Ship Charge.
					Volts.	Amps.		

.....
Minister of Posts and Telegraphs.
DEPARTMENT OF THE POSTAL TELEGRAPHS,
NEWFOUNDLAND.
Dated at St. John's this.....day of
.....19.....
PROVISIONAL
WIRELESS OPERATOR'S CERTIFICATE.
E This is to certify that the
bearer.....
resident of.....
is a British subject and is certified by the
local Superintendent of the Marconi Wireless

Telegraph Company of Canada to have the necessary technical proficiency for the position of wireless operator having acted as such on the steamer.....plying upon the territorial waters of Newfoundland from.....to.....
He has subscribed to the Oath of Secrecy and understands that this certificate is a provisional one, valid for not more than six months from the date of issue inscribed hereon.
Issued in accordance with the London Convention, 1912, and the Wireless Telegraphy

(Steamers) Act, 1914, Newfoundland Legislature, and regulations made thereunder.

General Post Office,

St. John's, Newfoundland.

..... day of

Minister of Posts and Telegraphs,
Newfoundland.

AMATEUR EXPERIMENTAL LICENSE.

192.... LICENSE No.....

DOMINION OF NEWFOUNDLAND.

LICENSE TO USE RADIOTELEGRAPHY.

F Issued in accordance with the provisions of the London Convention, 1912, and the Post and Telegraphs Amendment Act, 1906, and these Regulations made thereunder.

The herein named..... resident of..... herein called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at..... for the term of one year commencing on the..... day of..... and terminating on the..... day of..... and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of One Dollar (\$1) being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the term "Minister" means the Minister of Posts and Telegraphs service for the time being.

2. (1) The licensee shall not establish, install or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(2) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Newfoundland or the territorial waters abutting on the coasts of Newfoundland (whether on shore or on any ship), by or for the purposes of the Minister of any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

3. (2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (1) The coupling between the primary and the secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

5. (2) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy.

11. The licensed apparatus shall be operated in accordance with the Regulations issued by the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (1) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(2) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to those hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and use of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Postal Telegraph Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Minister of Posts and Telegraphs, St. John's Newfoundland.

.....
Minister of Posts and Telegraphs.

St. John's, Newfoundland.

....day of.....192
Department of the Postal Telegraphs, St. John's
Newfoundland.

Dated this.....day of.....192

SCHEDULE.

1. Name of station.....
2. Location
3. Call Signal
4. Classification of station under Regulation No.
5. Type of aerial.....
6. Natural wavelength of aerial.....
7. Transmitting wavelength.....
8. Decrement per complete oscillation.....
9. Characteristics of transmitting.....
10. Characteristics of receiver.....
11. Source of power.....
12. Maximum to be taken by transmitter.....
13. If A.C. number of cycles.....
14. Hours during which the station must not transmit.....
15. Stations with which the licensed stations may communicate.....

.....
Minister of Posts and Telegraphs.

Department of the Postal Telegraph Service,
St. John's, Newfoundland.

Dated this.....day of.....192....

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.

1. At amateur experimental stations the power used measured at the terminals of the transformer must not exceed $\frac{1}{2}$ kw.

2. The wavelengths which may be used vary with the distance between the licensed station and any commercial coast or land station or a route of navigation as follows :—

For transmission :—

Class I—Station located within five miles of a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 50 metres.

Class II—Stations located more than five but less than 25 miles from a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 100 metres.

Class III—Stations located more than 25 but less than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 150 metres.

Class IV—Stations located more than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 200 metres.

3. A distinctive call signal shall be allotted to each station commencing with the figure "8," e.g., 8AA, 8AB, which signal must be sent not less than three times at the termination of every transmission.

4. The Regulations of the International Radiotelegraph Convention, where applicable, be observed by the station.

5. The station must take every precaution to prevent interference with the working of other stations.

6. The station, when operating, must listen for the signal "STP" which will indicate that an amateur experimental station is interfering with commercial business.

7. The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

8. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times such as when the spark is being tested or sending is being practised the aerial must be disconnected.

NEW GUINEA (Late German New Guinea)

(See also Map Section)

Including : New Guinea, Kaiser Wilhelm's Land, Bismarck Archipelago (New Britain, New Ireland, The Admiralty Islands), Solomon Islands, Hermit Islands, Naurii Islands, Papua.

THESE territories were the possessions of Germany in the Western Pacific, which, as a result of the mandate from the League of Nations, December 17th, 1920, are now under the administration of the Australian Commonwealth.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in these territories. The laws and regulations of the Australian Commonwealth are, however, to be found under the section of that heading.

NEW IRELAND

(See under NEW GUINEA.)

NEW ZEALAND

(See also Map Section)

Including : Auckland Island, Chatham Islands, The Cook and other Pacific Islands, Kermadec Islands.

THE Dominion of New Zealand lies about 1,200 miles south-east of the mainland of Australia, and consists of three main islands in the South Pacific Ocean, known as the North, South, and Stewart Islands. They stretch between $33^{\circ} 0'$ and $53^{\circ} 0'$ S. latitude; their longitude varying from $160^{\circ} 0'$ E. to $173^{\circ} 0'$ W. The Colony includes several groups of smaller islands, and lying at some distance from those which form the centre of the Dominion. The total area is about 103,581 square miles with a population of 1,221,447 exclusive of aborigines.

The initial discovery is attributed to the Dutch explorer, Abel Jansen Tasman, who visited the South Island on December 13th, 1642. The first settlement of Europeans was made in 1814, British sovereignty was proclaimed in 1840, and the independence of the Colony dates from May 3rd, 1841. The constitution rests upon the Act of 1852, under which the Executive authority is vested in a Governor-General assisted by a Council of Ministers with a legislature of two houses.

CONTROL.

The Post and Telegraph Department is responsible for the administration of wireless telegraphy in New Zealand. The permanent head of this Department is the Secretary of the General Post Office at Wellington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Hon. Mr. J. G. Coates	Postmaster-General and Minister of Telegraphs.	Wellington
Mr. R. B. Morris	Secretary, Post and Telegraph Department	Wellington
Mr. A. T. Markman	First Assistant Secretary	Wellington
Mr. G. McNamara	Assistant Secretary	Wellington
Mr. E. A. Shrimpton, M.I.E.E. ..	Chief Telegraph Engineer	Wellington
Mr. A. Gibbs, M.I.E.E.	Deputy Chief Telegraph Engineer ..	Wellington
Mr. H. A. Huggins	Controller of Savings Bank and Accounts	Wellington

AMATEURS.

In order to meet the growing demand for permission to experiment in wireless telegraphy, the Department issued in April, 1921, what are called "provisional permits," authorising the use of wireless receiving apparatus for experimental or instructional purposes, the conditions of the permits being designed to prevent interference with the conduct of public wireless-telegraph work. The interest that is being taken in the subject by wireless enthusiasts in New Zealand is indicated by the fact that over 800 of these permits have already been issued. It is intended shortly, to replace the permits by formal licenses.

Up to the present time the issue of licenses for experimental and broadcasting transmissions has been confined to persons engaged in the scientific study of radio problems or closely connected with the manufacture of wireless apparatus from a technical or a commercial point of view. Regulations which provide for the issue of formal transmitting and broadcasting licenses to approved applicants are now in course of preparation.

ORGANISATION.

The first wireless installation was placed in the tower of the General Post Office at Wellington in June, 1910, and experiments were carried out with different wireless systems. Later on a "Telefunken" set was installed, and a wireless telegraph office opened for commercial work on July 26th, 1911. At that time there were not more than half a dozen ships fitted with wireless apparatus trading to the Dominion; now the majority of New Zealand ships carry wireless apparatus, as well as a large number of vessels registered in other countries and trading to New Zealand ports.

On October 14th, 1912, the G.P.O. station was replaced by one of $2\frac{1}{2}$ -kW. upon Mount Wakefield, immediately behind the City of Wellington. At this station, known as "Radio-Wellington," a continuous service is maintained.

On October 24th, 1912, a $2\frac{1}{2}$ -kW. station was established on the roof of the Post Office at Auckland. The normal range of these $2\frac{1}{2}$ -kW. stations is 300 miles by day and 600 miles by night.

The installation of a wireless set of $2\frac{1}{2}$ -kW. power on the Government cable steamer *Tutanekai* was completed on June 20th, 1912. The equipment has been found to be of much service in aiding in the work of the repair of submarine cables.

A wireless station was opened at CHATHAM ISLANDS on September 18th, 1913, connecting this group of islands with the mainland of New Zealand and extending the range of communication eastward.

The high-power stations at Awanui and Awarua were opened for public business on December 18th, 1913. These stations are of 30 kW. primary power Telefunken system, and were undertaken primarily for defence purposes. They are required to communicate with Sydney during the day as well as at night. The high power station at Apia (Samoa) and the low power station at Rarotonga (Cook Islands) are under the control of the New Zealand Government.

At the present time five stations in New Zealand are open for public service with ships.

ADMINISTRATION.

In July, 1914, regulations were made for the control of ships carrying wireless telegraph apparatus while within the territorial waters of New Zealand. The Regulations relating to ship stations were also amended by new Regulations issued on September 7th, 1914.

Broadcasting regulations will be introduced at an early date, but at the time of going to press they have not been definitely settled.

A—Extracts from the Post and Telegraph Act (Part X), 1908.

B—Extracts from Amendment Acts of 1911, 1913, and 1920.

C—Regulations under Order in Council, January, 1918.

D—Regulations (affecting ships registered in New Zealand).

E—Regulations as to ships being provided with Wireless (October, 1913).

F—Form of Ship License.

G—Provisional Permit for Wireless Receiving Apparatus.

POSTS AND TELEGRAPHS ACT.

A The following extracts from Part X of the Post and Telegraph Act, 1908, and from the Post and Telegraph Amendment Acts, 1911, 1913, and 1920, relate to wireless telegraphy in the Dominion:—

162. The Governor may from time to time establish stations for the purpose of receiving and transmitting telegraph messages within New Zealand or between New Zealand and parts beyond New Zealand by what is commonly known as "wireless telegraphy," including in that expression every method of transmitting messages by electricity otherwise than by wires, whether such method is in use at the time of the coming into operation of this Act, or is hereafter discovered or applied.

163. The provisions of Part VII of this division of this Act shall, as far as is applicable, *mutatis mutandis*, extend and apply to stations established under this part of this Act, and to communications by wireless telegraphy.

164. Every person who erects, constructs, or establishes any station or plant capable of transmitting or receiving wireless telegraphic signals otherwise than in accordance with a license granted by him in that behalf by the Minister of Telegraphs is liable to a fine not exceeding five hundred pounds, and any plant, machinery, instruments, and material used by him for such purpose may be forfeited and dealt with as the Minister directs.

Part VII of this division of the Act referred to deals with the construction and regulation of electric lines. It authorises the Governor to establish electric lines and purchase lines and plant. He may make regulations as to the management, working and maintenance of any telegraph. Any officer or person employed in the working of any telegraph who improperly divulges the contents of any telegram transmitted or presented for transmission by such telegraph, or the purport of such telegram, is liable to a fine not exceeding one hundred pounds, or to imprisonment with hard labour for any period not exceeding six months.

EXTRACTS FROM AMENDMENT ACTS OF 1911, 1913 AND 1920.

POST AND TELEGRAPH (AMENDMENT) ACTS, 1911 AND 1920.

B The Minister of Telegraphs may, in accordance with regulations to be made in that behalf by the Governor-General in Council, grant licenses to any person, association, or corporation for the installation and working within New Zealand, or on board any ship registered in New Zealand, of apparatus for wireless telegraphy, within the meaning of Part X of the principal Act.

(2) Subject to any such regulation, every such license shall be in such form and for such period and shall contain such terms, conditions, and restrictions, as the Minister of Telegraphs thinks fit.

(3) The Governor may by Order in Council make such regulation as he thinks proper as to the granting of such licenses, and as to the form, period, terms, conditions, and restrictions thereof and as to the fees payable in respect thereof.

POST AND TELEGRAPH (AMENDMENT) ACT 1913.

9. (1) The Governor may from time to time, by Order in Council, make such regulations as he thinks proper governing the use of wireless telegraph apparatus on merchant ships whether

foreign ships or British ships not registered in New Zealand, while within the territorial waters of New Zealand.

(2) Such regulations may provide for the detention of any merchant ship on which a breach of the regulations has been made, pending the institution and determination of proceedings in respect of such breach and the recovery of any fine imposed in respect thereof.

REGULATIONS.

FOR CONTROL OF SHIPS CARRYING WIRELESS TELEGRAPH APPARATUS WHILE WITHIN TERRITORIAL WATERS OR HARBOURS OF NEW ZEALAND.

LIVERPOOL, Governor-General.

ORDER IN COUNCIL.

At the Government House at Wellington, this 30th day of January, 1918.

Present.

HIS EXCELLENCY THE GOVERNOR-GENERAL IN COUNCIL.

C Whereas, by Order in Council dated July 13th, 1914, and published in the *New Zealand Gazette*, of July 16th, 1914, regulations were made, under the authority of Section 9 of the Post and Telegraph Amendment Act, 1913 (hereinafter termed "the said Act"), for the control of ships carrying wireless telegraph apparatus while within the territorial waters of New Zealand:

And whereas it is desired to revoke such regulations, and to make others in lieu thereof:

Now, therefore, His Excellency the Governor-General of the Dominion of New Zealand, in pursuance and exercise of the power and authority conferred upon him by the said Act, and acting by and with the consent of the Executive Council of the said Dominion, doth hereby revoke the regulations hereinbefore mentioned, and in lieu thereof doth hereby make the regulations set forth in the schedule hereto; and doth hereby order that such regulations shall have effect on and from the date of publication of this Order in Council in the *New Zealand Gazette*.

SCHEDULE.

REGULATIONS.

1. In these regulations, if not inconsistent with the context:—

"Territorial waters of New Zealand" means and includes all tidal waters included within the Dominion of New Zealand, and all parts of the open sea within one marine league of the coasts of that Dominion measured from low-water mark.

"In harbour" means inside any harbour in New Zealand or within three miles of the entrance of any such harbour which a ship is about to enter or leave.

"Minister of Telegraphs" means the Minister of Telegraphs for the time being.

"Wireless telegraphy" has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

"Telegraph" has the same meaning as in section 119 of the Post and Telegraph Act, 1908.

"Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

"The Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

“Coast station” means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

“Ship station” means a wireless telegraph station established on board a ship which is not permanently moored.

2. These regulations shall apply only to foreign merchant ships and to British merchant ships not registered in New Zealand, while such British or foreign ships are within the territorial waters of New Zealand, or in harbour.

3. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

SHIPS IN TERRITORIAL WATERS.

4. All apparatus for wireless telegraphy on board a merchant ship while in the territorial waters of New Zealand shall be worked in such a way as not to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established, installed, or worked, in the Dominion of New Zealand or the territorial waters thereof; and, in particular, the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established on ships at sea and wireless telegraph coast stations.

5. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the said apparatus, and it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the said apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service, and, subject thereto, for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

6. Any such officer of person may in such event as aforesaid, instead of taking possession of the said apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the said apparatus, either wholly or partly, and in such manner as he may direct, and such persons may enter upon any ship on which the said apparatus is installed accordingly; and the said officer or person may direct the person or persons in charge of the said apparatus to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the said apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the said person or persons in charge of the said apparatus shall obey and conform to all such directions.

SHIPS IN HARBOUR.

7. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in harbour, except with the consent in writing of the Minister of Telegraphs.

PENALTIES.

8. If any breach of these regulations is committed by any person on board any ship while in the territorial waters of New Zealand or in harbour, the person so committing the same and the owner and master of the ship shall be severally liable on summary conviction to a fine not exceeding £100.

(Clauses 9-12 deleted.)

13. Whenever the Minister of Telegraphs or the Secretary of the Post and Telegraph Department has reasonable cause to believe or suspect that any breach of these regulations has been committed on board any ship while in the territorial waters of New Zealand, or in harbour he may give notice in writing to the Collector of Customs at any port in New Zealand to detain the ship under section 9 of the Post and Telegraph Amendment Act, 1913, until the sum of £100, or such smaller sum as may be specified in the notice, has been deposited with the Collector by or on behalf of the owner of the ship.

14. If on the receipt of that notice, or at any time within three months thereafter, the ship is found within such port, the Collector of Customs shall withhold the certificate of clearance of the ship, under section 35 of the Customs Act, 1913, until and unless the aforesaid sum is deposited with him or the aforesaid notice of detention is withdrawn.

15. If within six months after the date of the offence in respect of which the ship has been detained a conviction for that offence is obtained against any person, the sum so deposited shall be available for the satisfaction of any fine and costs imposed or awarded by the conviction, and the residue, if any, shall be returned to the person by whom or on whose behalf the deposit was made.

16. If within the period of six months aforesaid no such conviction is obtained, the sum so deposited shall be returned to the person by whom or on whose behalf it was deposited.

J. F. ANDREWS,
Clerk of the Executive Council

WIRELESS TELEGRAPH REGULATIONS FOR SHIP STATIONS.

AFFECTING SHIPS REGISTERED IN NEW ZEALAND.

Whereas by Order in Council dated the twentieth day of November, one thousand nine hundred and eleven and published in the *New Zealand Gazette* of the twenty-third day of November, one thousand nine hundred and eleven, regulations were made under the authority of the Post and Telegraph Amendment Act, 1911 (hereinafter termed “the said Act”), as to the granting of licenses for the installation and working of apparatus for wireless telegraphy on board any ship registered in New Zealand, and whether on the high seas or in New Zealand waters, and as to the form, period, terms, conditions, and restrictions thereof, and as to the fees payable in respect thereof: And whereas it is desirable to revoke such regulations, and to make others in lieu thereof.

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in pursuance and exercise of the power and authority conferred upon him by the said Act, and of all other powers and authorities in that behalf enabling him, and acting by and with the advice and consent of the Executive Council, of the said Dominion, doth hereby revoke the regulations made by the above-mentioned Order in Council, and in lieu thereof doth hereby make the following regulations for the

LICENSE FOR THE INSTALLATION AND WORKING OF APP

Name of Ship on which Station established.	Class of Ship Station under the Radio-telegraph Convention, 1912.	Call Signal.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.	
					By Night.	By Day.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

purposes hereinbefore mentioned; and doth hereby order that such regulations and the revocation of the regulations first before recited shall have effect on and from the date of publication of this Order in Council in the *New Zealand Gazette*.

REGULATIONS.

1. In these regulations, if not inconsistent with the context:—

"Minister of Telegraphs" means the Minister of Telegraphs for the time being.

"Wireless Telegraphy" has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

"Telegraph" has the same meaning as in Section 119 of the Post and Telegraph Act 1908.

"Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy and a naval station and any other wireless telegraph station, whether a coast station or a ship station.

"The Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

"The International Telegraph Convention" and the "International Telegraph Regulations" means respectively the International Convention of St. Petersburg dated the 10th-22nd July, 1875, and the service regulations made thereunder; and include respectively any modifications of the convention or regulations made from time to time.

"The Radiotelegraph Convention, 1912," means the convention signed at London on the 5th day of July, 1912, and the service regulations made thereunder; and includes any modification of the convention or regulations made from time to time.

"Coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

"Ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The Minister of Telegraphs may, at the request of any person or company desirous of establishing, installing, working, and using on ships belonging to such person or company, and registered in New Zealand, apparatus for wireless telegraphy, grant to such person or company (hereinafter called "the licensee") a licence, in the form of the Schedule hereto, for the period, upon the terms, and subject to the conditions and restrictions hereinafter appearing.

3. Each ship station is bound to exchange radiotelegrams with any coast station, or with any other ship station, without distinction as to the radiotelegraph system adopted by that station.

4. Each ship station shall be of such class mentioned in Article 13 of the Service Regulations annexed to the Radiotelegraph Convention, 1912, as is specified in the licence issued in respect thereof, and the equipment of the station, hours of duty observed, and other requirements shall be appropriate to such class in accordance with the provisions of the Radiotelegraph Convention, 1912.

5. The apparatus used at all ship stations shall, as far as possible, be in keeping with scientific and technical progress. The waves emitted must be as pure and as little damped as possible.

6. The apparatus must be capable of transmitting and receiving at a speed of at least equal to twenty words per minute, the word being reckoned at the rate of five letters.

7. The apparatus shall be so constructed as to be capable of using wavelengths of 600 to 300 metres as measured by the standard of measurement in use by the Post and Telegraph Department for the time being; and such

ULE.
S FOR WIRELESS TELEGRAPHY ON BOARD SHIPS OWNED BY

Character of Apparatus.		Power.		
System of Radiotelegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be normally taken by Sending Instruments.	If Alternator is used, Number of Cycles per Second.
(8)	(9)	(10)	(11)	(12)

other wavelengths not exceeding 600 metres as shall be authorised from time to time by the Minister of Telegraphs; Provided always that the wavelength of 600 metres shall normally be used for communication, and, further, that the wavelength of 1,800 metres may be used for transmission in the exceptional case referred to by Article 35 (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912: Provided, further, that only wavelengths of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged.

8. The licensed apparatus shall not be used by the licensee, or by any other person either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by these regulations; and the licensee shall not, except with the consent in writing of the Minister of Telegraphs, send or receive messages from or at the licensed apparatus when in any harbour in the Dominion of New Zealand.

9. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister of Telegraphs so to do, close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of the license.

provisions of the license.

10. The licensee shall observe the International Telegraph Convention and International Telegraph Regulations so far as the said convention and regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

II. The licensee shall observe the provisions of any regulations from time to time made under the provisions of the Post and Telegraph

Act, 1908, and its amendments, by the Governor in Council or by the Minister of Telegraphs in relation to the conduct of wireless telegraph business, so far as the same are applicable to the licensee.

12. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

13. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister of Telegraphs from time to time for the purpose of preventing interference with the working of any other wireless telegraph station, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

14. The licensed apparatus shall not, without the consent of the Minister of Telegraphs be altered or modified in respect of any of the particulars referred to in the license issued in respect thereof, and such apparatus shall at all times be maintained in good working order.

15. Except as provided in these regulations, the licensee shall transmit messages by means of the licensed apparatus on equal terms, without favour or preference, whether as regards rates of charge, order of transmission, or otherwise.

16. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay, and with priority over all other messages to the proper authorities by means of the licensed apparatus or by any other means in the power of the licensee.

17. The licensed apparatus at ship stations shall be worked only by a person or persons holding a certificate or certificates issued or recognised by the Minister of Telegraphs. Certificates shall be granted to persons of British nationality possessing the qualifications prescribed by the Radiotelegraph Convention, 1912, and shall be in such form and subject to such conditions, directions, or rules as the Minister of Telegraphs shall from time to time

prescribe: and such certificates may at any time be withdrawn at the discretion of the Minister of Telegraphs in case of misconduct, or breach on the part of the holder of the Radiotelegraph Convention, 1912, or of any conditions, directions, or rules prescribed by the Minister of Telegraphs for the guidance of operators or for the working of such ship stations.

18. (1) The licensee, his servants and agents, shall not divulge the contents or the purport of the contents of any message, or make any use whatever of any message coming to his or their knowledge, other than to the addressee or his authorised agent, or to properly authorised officials of His Majesty's Government or of the Minister of Telegraphs, or to a competent legal tribunal.

(2) The licensee shall render to the Minister of Telegraphs such accounts as the Minister of Telegraphs shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the licensed ship stations and coast stations, and shall pay to the Minister of Telegraphs, at such times and in such manner as the Minister of Telegraphs shall direct, all sums which shall be due from the licensee under such accounts.

19. The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed apparatus; and in such registers each of such messages shall be accompanied by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister of Telegraphs shall from time to time reasonably require to be shown. The licensee shall preserve all used message forms written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraph Convention, 1912, and, in default of any provisions on the subject in the said convention, for such period as is from time to time prescribed by the International Telegraph Regulations; and such registers and message papers shall be open to the inspection of the Minister of Telegraphs or his authorised officers.

20. The Minister of Telegraphs, and any agent authorised in that behalf in writing by him, may at all reasonable times enter upon any licensed ship station for the purpose of inspecting, and may inspect, any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and user of such apparatus and telegraphic instruments.

21. The licensee shall carry on every ship on which a ship station is established a print or copy of the license, certified under the hand of an appropriate officer of the Minister of Telegraphs to be a true copy, and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls, and also such documents as may be prescribed by the Minister of Telegraphs for the purpose of enabling the licensee to communicate with coast stations and ship stations, in accordance with the Radiotelegraph Convention, 1912.

22. (1) Every license shall be in force from the date of the granting thereof until the 31st December of the year in which it is issued, and no longer; but may be renewed from year to year.

(2) The licensee shall pay to the Minister of Telegraphs for and in respect of the license granted, and of every renewal thereof, a royalty of 5s. in respect of each ship station included in the license.

(3) All royalties payable under any license shall be payable on the date of the granting or renewal thereof, as the case may be.

23. Except with the consent in writing of the Minister of Telegraphs, the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefit of any license.

24. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

25. Any such officer or person may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly; or the said officer or person may direct the licensee, his servants or agents, to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the licensee, his servants or agents, shall obey and conform to all such directions.

26. In any of the following cases, that is to say:—

(a) In case any sum of money which ought to be paid by the licensee to the Minister of Telegraphs under or by virtue of these regulations shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents, of any of the provisions (other than a provision for the payment of money) or conditions herein contained,—

then and in any such case the Minister of Telegraphs may, by notice in writing, revoke and determine the license as to all or any of the ship stations thereby licensed, and thereupon the said license shall absolutely cease, determine, and become void as to all or any of the said ship stations, as the case may be, but without prejudice to any right of action or remedy which shall have accrued to His Majesty under these regulations or otherwise.

27. Nothing in these regulations shall prejudice or affect the right of the Minister of Telegraphs from time to time to establish, extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to those licensed hereunder or otherwise) in such manner as he shall in his discretion think fit. Neither shall anything herein contained prejudice or affect the right of the Minister of Telegraphs from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether of a like nature to those licensed hereunder or otherwise) or the transmission of messages in any part of New Zealand by means of wireless telegraphy, or by any other means, with or to any person or persons whomsoever, upon such terms as he shall in his discretion think fit. And (save as in these regulations expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister of Telegraphs by or under the Post and Telegraph Act, 1908.

28. Any notice, request, or consent (whether required to be in writing or not) to be given by the Minister of Telegraphs under these regulations may be under the hand of the Secretary for the time being of the Post and Telegraph Department, and may be served by sending the same in a registered letter addressed to the licensee at the office or place of residence for the time being of the licensee, or, if such notice, request, or consent relates to any particular ship station, by delivery to the master of the ship upon which such station is installed; and any notice to be given by the licensee under these regulations may be served by sending the same in a registered letter addressed to the Secretary, General Post Office, Wellington.

29 All licenses heretofore issued under the regulations hereby revoked shall continue in force, subject to the regulations under which they were issued, until the expiry of the current term thereof, but shall not be capable of renewal under the regulations so revoked.

REGULATIONS

AS TO SHIPS BEING PROVIDED WITH WIRELESS TELEGRAPHY APPARATUS.

ORDER IN COUNCIL.

E At the Government House, at Wellington, this twentieth day of October, 1913.

Whereas it is enacted by Section 50 of the Shipping and Seamen Amendment Act, 1909, that the Governor may from time to time by Order in Council make regulations requiring ships registered in New Zealand, and carrying passengers, to be provided with apparatus for transmitting messages by means of wireless telegraphy, and may by such regulations prescribe fines not exceeding fifty pounds for any breach thereof by the owner or master of a ship. And whereas it is desirable to make such regulations:

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in exercise of the hereinbefore recited power and authority, and acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations, and doth hereby order that they shall come into force on July 1st, 1914:

Provided that, if in his opinion the circumstances justify it, the Minister of Marine may exempt any steamship from the operation of these regulations, and may limit the time for which any such exemption shall be in force.

REGULATIONS.

1. Every steamship registered in New Zealand, and carrying passengers, which is engaged in the foreign or inter-colonial trade, except steamships trading to the Chatham, Auckland, Campbell, and Antipodes Islands, and every home trade steamship which is authorised by her ordinary survey certificate to carry not less than 150 passengers at sea, shall not leave or attempt to leave any port in New Zealand unless such steamship is equipped with an efficient apparatus for radio communication in good working order, to be operated by a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night.

2. Ships required by these regulations to carry the apparatus prescribed above shall be placed in the third class as defined by Article XIII of the Detailed Service Regulations, appended to the International Radiotelegraph Convention, 1912—that is, they are not bound to perform any regular listening service.

3. The Minister of Marine may appoint inspectors for the purposes of these regulations, and such inspectors and superintendents of Mercantile Marine may visit any steamship required by these regulations to be equipped with apparatus for radio communication before they leave port, and ascertain if they are equipped with such apparatus the operation of which shall be carried out by a telegraphist holding a certificate as prescribed by Article X of the Detailed Service Regulations attached to the International Radiotelegraphic Convention.

4. Where a passenger steamship subject to these regulations is without the apparatus and the operator prescribed, and is about to attempt to leave port, an inspector or superintendent shall:—

(a) Notify the master of the fine to which he will be liable and of the particulars in respect of which the law has not been complied with;

(b) Notify at once the Collector of Customs, who may thereupon withhold the vessel's clearance until the requirements of these regulations are complied with;

(c) Prepare a report in writing of his action and transmit it to the Collector of Customs, who shall forward a copy to the Secretary of the Marine Department.

5. An inspector or superintendent may, at any time before a vessel subject to these regulations leaves port, require the master to give him a certificate, in the form set forth in the appendix hereto, that the wireless apparatus of his ship is sufficient and in good working order, and the master shall give such certificate before the vessel leaves port.

6. The power necessary to transmit signals shall at all times, while the vessel is under way be available for the wireless operator's use.

7. Subject to the above regulations, the installation and operation of the apparatus required by them to be fitted shall be in conformity with the requirements of the Post and Telegraph Act, 1908, and its amendments, and the regulations made thereunder.

8. Any master or owner of a steamship committing a breach of these regulations is liable to a fine not exceeding £50.

APPENDIX.

This is to certify that the wireless operator in principal charge of the apparatus for radio-communication on the s.s. " " has this day certified to me in writing that the said apparatus is efficient and in good working order.

(Signed)

Master.

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATION.

F In pursuance and exercise of the power and authority conferred upon me by section 3 of the Post and Telegraph Amendment Act, 1911, I, Minister of Telegraphs of the Dominion of New Zealand, hereby grant a license to _____ for the installation and working of apparatus for wireless

telegraphy (within the meaning of Part X of the Post and Telegraph Act, 1908), on board the ship or ships named in the Schedule hereto, and subject to the regulations providing for the working of wireless telegraphy on ship stations made by Order in Council of the seventh day of September, 1914, a copy of which is printed hereon.

Given under my hand, at Wellington, this _____ day of _____, 19____

Minister of Telegraphs

Entered in the Register of Warrants of the Minister of Telegraphs, this _____ day of _____, 19____

Secretary, Post and Telegraph Department.

SCHEDULE.

LICENSE FOR THE INSTALLATION AND WORKING OF APPARATUS FOR WIRELESS TELEGRAPHY ON BOARD SHIPS OWNED BY

(1)	(2)	(3)	(4)	(5)	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		
					By Night.	By Day.	System of Radio-telegraphy, with the Characteristics of the System of Emission.	Wavelengths (in Metres).	Source & Maximum Output.	Maximum to be normally taken by Sending-instruments.	If Alternator is used, Number of Cycles per Second.
					(6)	(7)	(8)	(9)	(10)	(11)	(12)

POST AND TELEGRAPH DEPARTMENT.
PROVISIONAL PERMIT ISSUED BY THE MINISTER OF TELEGRAPHS.

G AUTHORIZING THE USE OF WIRELESS RECEIVING APPARATUS FOR EXPERIMENTAL OR INSTRUCTIONAL PURPOSES AS INDICATED HEREON.

PARTICULARS REGARDING PERMITTEE AND APPARATUS.

Name of person to whom the permit is issued, and where applicable, the body on whose behalf the permit is held:—

Address:—

Location of apparatus:—

Purpose for which apparatus authorised (experimental or instructional):—

THIS PERMIT authorises the person or body referred to herein to use for experimental/instructional purposes wireless receiving apparatus subject to the conditions hereinafter mentioned. The Permit is a provisional one and will subsequently be replaced, where circumstances justify the same, by a license.

The Permit is subject to withdrawal or cancellation at any time when, in the opinion of the Minister of Telegraphs, such action becomes necessary.

Any breach of the conditions referred to will result in withdrawal or cancellation of the Permit and will be regarded *per se* as indicating the unfitness of the Permittee to receive a regular license.

While it is the intention to give every reasonable facility to persons or bodies who are in any way likely to further the interests of wireless science or of radio communication, and who are not actuated solely by motives of amusement, it should be distinctly understood that the Minister of Telegraphs is charged *inter alia* with the responsibility for the uninterrupted carrying-on of the public radio services, for the secrecy of public radio correspondence, and for the reliable detection of Distress Signals upon which depends in a great measure the safety of life at sea. These facts render it imperative that the following conditions should be strictly observed, and Permittees are therefore enjoined to co-operate with the Post and Telegraph Department in every possible way

with a view to ensuring the furtherance of the objects mentioned.

Secretary, Post and Telegraph Department.
Date

Signature of Permittee.

Witness:

Radio Inspector.

Date:

CONDITIONS UNDER WHICH PERMIT IS ISSUED

1. "Radio Inspector" in this Permit means the District Telegraph Engineer of the district in which the wireless receiving station is situated, or such officer or officers as may be deputed by him. "Permittee" means the person in whose name the Permit is issued, and who is held responsible for the due observance of the following conditions:—

2. *Object of Permit.*—This Permit authorises the use of the wireless receiving apparatus described in Schedule A, or such modification thereof as may subsequently be approved in writing by the Radio Inspector.

3. *Alterations to Apparatus.*—Any change that is contemplated in the type or characteristics of the receiving apparatus referred to in Schedule A must first be notified in writing to the Radio Inspector and be accompanied where necessary by descriptive diagrams. These changes must not be effected until the written sanction of the Radio Inspector has been obtained. This precaution is necessitated mainly on account of the highly "interfering" properties of valve receivers operating under certain conditions, and it should be clearly understood by Permittees authorised to use valve receivers that serious interference may actually result from the same within a radius of ten miles of a public radio station.

4. *Amateur Warning Signal.*—When using valve receivers within ten miles of a Government Radio Coast Station, Permittees must continually listen for the Amateur Warning Signal from such station—*viz.*, A.A.A.A.Q.R.M. (followed by a figure indicating minutes), and must immediately cease operations upon receipt of the same until the time indicated has expired. In this connection the greatest care must be exercised on the part of the Permittee to avoid interfering with the receipt and handling by radio stations open for public correspondence of the International Distress Signal, SOS.

5. *SOS Signals: Procedure.*—If, in connection with his use of the authorised apparatus any Distress Signals should come under the notice of the Permittee, and there is reason to believe that such signals have not been intercepted by a radio station open to public correspondence, the Permittee shall immediately take such steps as may be available (*e.g.*, by telephone) for communicating the same to the nearest Government radio station, or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

6. *Custody of Apparatus.*—The wireless apparatus authorised by this Permit shall be kept in secure custody, and no part of the same shall be removed from its authorised location without the approval of the Radio Inspector.

7. *Inspection of Apparatus.*—The wireless apparatus shall be subject to inspection by the Radio Inspector at all times, and every facility shall be given to such officer to carry out any inspection or test that may be considered necessary

8. *Supervision by Permittee.*—The apparatus shall not be brought into operation for any purpose in the absence of the Permittee or apart from his supervision, and in order to safeguard this requirement the Permittee must see that Condition 6, requiring the apparatus to be kept in safe custody, is faithfully observed.

9. *Declaration of Secrecy.*—The Permittee shall be required to execute a Declaration of Secrecy which provides that he shall not divulge to any unauthorised person any information relating to public radio correspondence which may come to his knowledge, and that he will by every means in his power seek to preserve the secrecy of the same. Exception is made in the case of meteorological and time signals which are broadcasted for general information. Any breach of this condition will be seriously noticed. The Permittee shall not commit to writing any such public radio correspondence that may come to his knowledge, and shall be responsible for seeing that no unauthorised person is permitted to become acquainted with the same. In the case of bodies for whom the Permittee may be acting in a representative capacity, the latter shall be held responsible for satisfying the Radio Inspector that all members of the body having access to the apparatus shall first have executed the Declaration of Secrecy. The apparatus shall be regarded as under the direct supervision of the Permittee, but, in order to facilitate the work of such body, the responsibility of supervision may be shared with one or more approved persons, as may be arranged in writing with the Radio Inspector. These responsible supervisors shall be present whenever the apparatus is being used, and shall supervise such use with the object of ensuring that all the conditions of the Permit, particularly those relating to the Amateur Warning Signal, to Distress Signals, and to the secrecy of public correspondence, are strictly observed.

10. *Log Record.*—The Permittee shall keep a log record showing the hours during which the authorised apparatus is in operation and embodying a record of the reception of any of the special signals referred to in Condition 4. This log shall be produced for perusal by the Radio Inspector whenever required.

11. *Temporary Disuse of Apparatus.*—Apart from the requirements of Condition 4, the use of the apparatus shall cease at any time and for any period that may be considered necessary by the Radio Inspector.

12. *Amendment of Conditions.*—The Permittee shall be prepared and shall be required to comply with any amended or additional conditions that circumstances may from time to time render it necessary to impose.

SCHEDULE A.

DESCRIPTION OF WIRELESS RECEIVING APPARATUS AUTHORISED UNDER THIS PERMIT.

NICARAGUA

(See also Map Section)

THIS Central American State lies between Costa Rica on the south and Honduras on the north. Its area is estimated at 49,200 square miles, and it possesses a coast line of about 300 miles on the Atlantic, whilst that on the Pacific Ocean stretches for about 200 miles. It has a population of 638,119.

The present constitution came into force on April 5th, 1913. It vests the executive functions in a President, and the legislative power in a Congress of two houses. On February 18th, 1916, a treaty between Nicaragua and the United States was ratified, which laid down the conditions for the acquisition by the latter of naval bases on the Pacific and Atlantic coasts and of the projected canal route.

CONTROL.

The control of wireless telegraphy and telephony is in the hands of the Government, under the direction of the Minister of Public Works and the Director-General of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
General Tomás Masís	Minister of Public Works	Managua.
Mr. Paulino Solórzano	Director-General of Communications	Managua.

ORGANISATION.

With regard to wireless telegraphy, none of the installations at present existing in Nicaragua is owned by the Government. The United States Government possesses a station in Managua, the capital of the Republic, and there are two stations owned by private companies on the Atlantic Coast. These stations (with the exception of that owned by the American Government) have been erected under contract with the Government of the Republic, and are subject to the provisions of the London Radiotelegraphic Convention of 1912. Only one of them is open to public service with ships.

The United Fruit Co. erected in 1906, a radiotelegraphic station at Bluefields for correspondence with the United States and Europe. They also owned a station at Rama, situate on the Escondido River, about 40 miles above Bluefields, but this was abandoned when the Company discontinued its banana producing and exporting activities in Nicaragua.

A small station has also been erected at the Eden Mines in Pis Pis mining district at the expense of the company, and is used exclusively by the firm.

The Mexican Government have offered the Government of Nicaragua a wireless station, which will be erected in, or in the neighbourhood of the town of, Managua. It will be used for public correspondence for both land and ship stations.

A receiving station has recently been installed at the Administration General of Communication for press and time (75 meridian) messages.

ADMINISTRATION.

The Nicaraguan Government have granted a concession to the Tropical Radio Telegraph Co. for the installation and exploitation of wireless stations in the country for public use.

NIGERIA

(See also Map Section)

THIS territory comprises the Colony and Protectorate of Nigeria, which is practically identical with the old Colony of Lagos. The Protectorate is divided into the Northern and Southern Provinces, which almost coincide with the old Protectorates of Northern and Southern Nigeria. It has an area of 332,000 square miles, with a population of 16,250,000.

The Governor and Commander-in-Chief of the Colony is *ex officio* the Governor and Commander-in-Chief of the Protectorate. The Northern and Southern Provinces are each administered by a Lieutenant-Governor. The Colony is administered by the Lieutenant-Governor of the Southern Province.

An Executive Council advises the Governor both for the Colony and Protectorate. The Legislative Council confines its operation to, and considers, the laws and estimates of the Colony. The Nigerian Council is an advisory and deliberate body.

CONTROL AND ORGANISATION.

There is only one wireless station in Nigeria—at Lagos—and this was erected by the African Direct Telegraph Company in 1912. It is open to public service with ships. The Postmaster-General controls the wireless services.

ADMINISTRATION.

Wireless telegraphy is administered under :—

A—The Wireless Telegraph Ordinance, 1916.

B—Regulations made under the Ordinance of 1916.

THE WIRELESS TELEGRAPHY
ORDINANCE, 1916.

A 1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1916.

2. *Definition.*—Definition: "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received.

3. *License for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in Nigeria except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus Aboard Ships to be Worked in Accordance with Regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of Nigeria, otherwise than in accordance with regulations made under this Ordinance.

5. *Regulations.*—(1) The Governor may make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless

telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of Nigeria shall be subject to such further Regulations as may be made by the Governor and such Regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf, or contrary to the provisions of any Regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by a superior officer and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. *Penalties and Procedure.*—Any person who shall offend against any provision of this Ordinance or any of the Regulations made thereunder shall be liable to a fine of fifty pounds, and the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Saving Section as Regards Electrical Apparatus.*—Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than that of wireless telegraphy.

9. Repeal No. 12 of 1913 of *Southern Nigeria and Chapter 55 of the Laws of Northern Nigeria*.—The Wireless Telegraphy Ordinance, 1913, and the Wireless Telegraphy Proclamation are hereby repealed.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1916.

B The following Regulations are made by His Excellency the Governor-General under and by virtue of the provisions of section 5 of the Wireless Telegraphy Ordinance, 1916:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Nigeria shall be worked in such a way as not to interfere with:—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in Nigeria or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval signalling" means signalling by means of any system of

wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay or waters of Nigeria except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by His Excellency the Governor this 10th day of November, 1916.

NORWAY

(See also Map Section)

THE most westerly of the Scandinavian nations emerged from the obscurities of myth and legend in the ninth century, and after a vigorous separate national existence, was united with Sweden and Denmark under Queen Margaret by the Union of Kalmar in 1397. In 1814 Norway separated from Denmark, and Charles XIII of Sweden established his rule over the two countries. This co-partnership endured until the peaceful revolution of 1905 restored to the Norwegians their complete independence, with Haakon VII as reigning King.

Norway covers an area of 124,964 square miles, with a population of 2,646,306.

CONTROL.

Radiotelegraphy is organised under the supervision of the Telegraph Department; whilst for naval and military purposes the War Office and Admiralty exercise jurisdiction over their own wireless section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Capt. Niels Stockfleth Schultz Nickelsen Mr. H. Petersen ..	Director-General of Posts and Telegraphs .. Radio Engineer and Chief of Wireless Department Director of Mining Department of the Navy Inspector Wireless Department of the Navy..	Christiania Christiania (Telegraph Department) Horten (Navy Yard) Horten (Navy Yard)

ORGANISATION.

The first wireless stations to be erected and opened for public correspondence were those at Sörvaagen and Röst, both completed in 1906. Radiotelegraphic communication was established in 1911 between Norway and Spitzbergen, and has been maintained ever since.

Some improvements have been made in the existing land stations, the Bergen radio having been equipped with a 5 kW. valve transmitter. The Government intend modernising the Stavanger Transatlantic Station, the transmitter as well as the receiver, but nothing has as yet been decided upon. Two $\frac{1}{4}$ kW. automatic radio beacons are to be erected in the near future, one on the Færder Lighthouse at the entrance of the Kristianiafjord, and the other on the Marstenen Lighthouse on the west coast of Norway, near Bergen.

In the Norwegian Mercantile Marine progress is still being made in the fitting of ship stations, and by the end of this year probably about 550 ships will be fitted with wireless, about two-thirds of this total having the Marconi system installed.

The latest available statistics enumerate :—

Stations for public service to ships	..	..	..	7
Stations for Government traffic only	..	..	..	1
Stations for public service	..	..	..	3
Stations for public service radio telephony	..	..	..	2
Stations for Transatlantic public traffic	..	..	..	1
Stations under construction	..	..	..	3
Installation on Norwegian merchant vessels	..	..	..	about 500

Two Norwegian companies have been formed under the titles of "Norsk Marconi Kompani A/S" at Christiania, and A/S Det Norske Radioselskap. The former company is working in conjunction with Marconi's Wireless Telegraph Co., Ltd., London, and has the sole rights of the Marconi patents for Norway. The latter is working in conjunction with the Telefunken Company.

Meteorological, Storm Warning and Fisheries Services are largely in use, and there are three D.F. stations in operation.

There has recently been formed a wireless club called Norsk Radio Amatør Klub.

ADMINISTRATION.

The Laws and Regulations under which wireless is administered in this country appear in the following pages in accordance with the list appended hereto :—

The general laws and regulations with regard to the control and use of wireless stations are still unchanged, and the question of amateur licenses and experimental working for private individuals is not yet solved. There is, however, reason to believe that everything is being done to facilitate matters, particularly in view of the broadcasting problem which is also arising in this country.

A—Law of July 24th, 1914.

B—Law of August 18th, 1914.

C—Regulations.

D—Ship License.

E—Certificate for Wireless Telegraphists.

F—Agreement between Telegraph Administration of Norway, Denmark and Sweden regarding expeditious forwarding of radiotelegrams.

LAW OF JULY, 1914.

A Law of July 24th, 1914, supplementing and amending the Law of April 29th, 1899, relating to the forwarding of communications by aid of telegraphic conductors or such like installations and relating to the repeal of Law No. 2 of July 16th 1907 :—

Section 1.—On ships which sail under the Norwegian flag and which do not belong to the Norwegian Navy, stations or installations for telegraphing or telephoning by wireless both within and without the boundaries of the Kingdom may only be installed and worked

after an authorisation obtained in advance, which will be granted by the King, or whoever may be authorised thereto, on certain definite conditions for a stipulated period of time. The permission may at any time be withdrawn if the conditions imposed are not adhered to.

Detailed Rules and Regulations relating to the fitting up and working of such stations or installations shall be drawn up by the King.

On ships which sail under a foreign flag and are within Norwegian territorial waters wireless telegraphing and telephoning can only be carried on—even if they have permission for same from the authorities of the foreign

country—subject to observance of the provisions which are made with respect thereto by the King or whomsoever he may have authorised for the purpose, who may, moreover, forbid all telegraphing or telephoning from such ships, whenever circumstances may be considered to require it.

Section 2.—The exceptions mentioned in the Law of April 29th, 1899, under Section 1, 2nd paragraph, relating to the working of plant which may be used by a commune or private person for his own use, or such as railways may install for their own working, shall not apply so far as the working of installations for wireless telegraphy or telephony are concerned.

Section 3.—Any infractions of the aforementioned conditions shall be punished pursuant to the provisions laid down in the Law of April 29th, 1899, Section 6.

Moreover, any transgression of the rules or provisions which are drawn up with regard to Section 1 of the present Law shall be punished by fines.

Section 4.—This Law shall come into force immediately. The Law of July 16th, 1907, containing additions and amendments to the Law of April 29th, 1899, relating to the forwarding of communications by means of telegraph lines or similar installations, is hereby repealed.

LAW OF AUGUST, 1914.

B The following paragraph, taken from the "Law of August 18th, 1914," amending the Law of April 29th, 1899, relates directly to Wireless Telegraphy:—

Within the boundaries of Norway, or its territorial waters, stations and installations for wireless telegraphy and telephony may only be erected or worked after permission has been obtained from the King or whomsoever he may authorise thereto, and on such conditions as are laid down in the said permission.

REGULATIONS.

C The following regulations are based on the Law of July 24th, 1901:—

1. Within the limits of Norwegian territorial waters radiotelegraphic or radiotelephonic stations on board foreign ships must not be used without special license, unless it concerns:—

(1) Correspondence regarding ships in distress or in order to prevent accidents.

(2) Correspondence with the nearest Norwegian coast station.

(3) Correspondence with other ship stations provided each of the ships are at least 10 nautical miles from the nearest Norwegian coast station.

In the cases (2) and (3) the correspondence shall at once be suspended if it is required by the Telegraph Department, the Marine Department, or by any one of the radio stations under their authority.

2. In Norwegian ports, where official radio stations are established, and within territories which at any time may be determined by Norwegian authorities, and about which information may be obtained at the nearest official coast station, the ship station must not be used for other correspondence than mentioned in para. 1 (1), unless special permission is obtained.

3. Requests for permission to use the radio stations within the Norwegian territorial waters for other correspondence than mentioned above must be sent to the Telegraph Department, which takes its decision after conference with the Marine Department.

4. However, the preceding provisions do not, with the following exceptions, apply to stations on board foreign ships of war. Provided the

ships enter Norwegian ports, where official radio stations are established (see the list published by the Telegraph Department), and wish to make use of the radio apparatus on board, they shall first apply to the manager of the official radio station at the place, which will inform at what times it is permitted to use the apparatus.

At this application, which can take place by radio, the wavelength which one wishes to use shall be stated.

In Norwegian ports and territorial waters such vessels may otherwise freely use their radio stations. The correspondence must, however, at once be suspended, when it is required by the Telegraph Department, the Marine Department, or by any one of the stations under their authority.

5. Whenever the radio station is used during the stay of the ship in Norwegian waters, this shall be done subject to the regulations contained in the International Telegraph Convention, with the rules pertaining thereto.

6. The above-mentioned regulations are only applicable when Norway is not at war, and only to the ships of non-belligerent foreign forces.

7. The preceding regulations come into force from September 1st, 1922. From the same date the previous regulations approved by the Royal Decree of October 24th, 1908, are repealed.

NORWEGIAN LICENSE CONDITIONS.

D Conditions for erection and working of Radiotelegraph and Radiotelephone stations on board ships (ship stations).

FORM OF LICENSE.

According to the Law of 24th July, 1914, and the Royal Decree of the 30th August, 1913, permission is hereby given to.....

..... to erect and work on board the ship..... a Radiotelegraph Station (Radiotelephone Station) on accordance with the Table of Particulars on the last page of this form. The permission is valid from..... to..... and is given on the following conditions.

1. The station shall belong to the..... class of stations as specified in the International Radiotelegraph Convention Service Regulations, Art. XIII b, and will thus have..... service.

2. The installation shall be effected in every respect in accordance with the installation plan approved by the Telegraph Department, and must not be departed from without the agreement of the said department. Ships belonging to the 1st and 2nd classes must be provided with emergency Radiotelegraph installations, as laid down in the existing Radiotelegraphic Service Regulations.

3. The holder of the license shall, as far as the erection and working of the station is concerned, be under the obligation in every respect to adhere to existing international agreements with annexed regulations concerning Radiotelegraphy and Telephony when such International agreements have been adhered to by Norway, and further he shall abide by such regulations as may be issued by the Department for Public Works or by the Telegraph Department.

4. The Telegraph Department shall have the right, in the interests of the service and (after conferring with the Naval Department) to require any alterations to be made in the wavelengths employed as given in the above-mentioned Table of Particulars within the limits laid down in the regulations either as a temporary or permanent measure in the working of the station.

5. The holder of the license shall recognise the importance of keeping the station in the best possible condition in order to ensure good working.

6. The station shall be under the obligation to forward telegrams to and from persons on board, with due regard to existing general rules for such work. Further, the station shall be obliged to communicate with other ship or coast stations without regard to the system of apparatus employed at those stations.

7. The answering of signals from ships in distress and the correspondence caused thereby shall have priority over all other correspondence.

8. During the ship's stay in a Norwegian Port the station must not be used for communication either with Norwegian or with Foreign coast stations. Neither shall the station, while the ship is in a Norwegian port, be used for communication with other ship stations without special permission, or unless such communication is effected with a view to prevent accidents. Special permission is granted by the Telegraph Department after conferring with the Naval Department.

9. The call signal of the station is.....

10. The tax due to the ship station is.....
.....(ore) centimes) per
word with a minimum of(ore)
(..... centimes) per message.

11. The service on board must be performed by one telegraphist, or, for ship stations of class I, by two or more telegraphists holding a certificate issued by the Telegraph Department.

This certificate states that the telegraphist concerned possesses the knowledge and abilities as prescribed in the existing International Regulations.

The granting of such certificate depends upon the passing of an examination arranged by the Telegraph Department. Petty Officers and Seamen belonging to the Navy's staff of mechanics, and who are specially trained as Radiotelegraphists for the Navy, are entitled to such certificate when they can prove to the Telegraph Department that they have the necessary knowledge of the handling of telegrams and when they procure from the authority concerned in the Navy, a testimonial to the effect that they satisfy the International Regulations as far as their knowledge of the instruments, ability, etc., is concerned. Without the permission of the Telegraph Department other than Norwegian subjects must not be employed for the service on board.

The holder of the license will take the best possible care that the contents of messages do not come to the knowledge of unauthorised persons.

The telegraphist will make the usual promise of secrecy.

12. The holder of the license is responsible for the charges that are due for the transmission of the messages sent from the ship station, including the charge for the coast station.

The Telegraph Administration, on its side, pays to the holder of the license the charges that are due to the ship station for the messages addressed to the ship. "Journals" (abstract) should be kept in respect of the correspondence (traffic). These "Journals," together with the originals of the transmitted messages and such other documents as may be required, are to be sent to the Telegraph Department, as far as possible, at the end of each month.

The mutual settlement of the charges will take place quarterly or monthly, as may be

arranged between the Telegraph Department and the holder of the license. However, with the agreement of the Telegraph Department the holder of the license may make other arrangements for the accounting of stations on ships that are exclusively engaged in foreign waters. Such arrangements may be made with the Administrations to which the coast stations that the ships usually make use of belong. Similarly, the Telegraph Department may make arrangements other than those mentioned above with Foreign Administrations.

13. The station is subject to such supervision as may be decided by the Department for Public Works, and one or more of the Officials appointed by the Department for Public Works or by the Telegraph Department should be given opportunity to inspect the station.

For the supervision of the station the holder of the licence has to pay a certain fee that will be decided by the Department.

14. When State or other public reasons so demand it, the Department for Public Works or the Naval Department may partly or entirely prohibit the transmission of any kind of traffic correspondence at the station without admitting any claim for compensation. Likewise, in the interests of the service, the Telegraph or Naval Department can prohibit with the same effect all correspondence from the station, either at certain places or at certain times of the day.

15. The Norwegian State has the right to take over the station with six months' notice against compensation, the amount of which will be fixed after valuation, should it not be possible to arrive at an amicable adjustment.

The valuation will be made by a Committee of three members, whereof one member is nominated by the owner, one by the Telegraph Department and one by the Department for Public Works.

The member nominated by the Department for Public Works will be the Chairman of the Committee.

The questions put before the Committee will be decided solely by majority of votes.

In case the owner has not, within thirty days after the reception of the invitation, made any such nomination as mentioned above, or in case the member nominated by him fails to attend, the valuation will then with obligatory effect be decided by the other nominees.

In case of equal voting the vote of the Chairman shall decide the matter.

In the valuation regard shall only be paid to the technical value of the station at the moment of valuation, the income, etc., derived from the station not being taken into account.

The valuation shall take place within a time-limit fixed by the Telegraph Department and will be at the public expense.

16. The license shall become null and void in case:—

(a) Use is not made of it within a year of its issue.

(b) Breach is made of any of its regulations.

(c) The ship ceases to fly the Norwegian flag.

17. Disputes as to the intent and meaning of this licence shall, with obligatory effect, be decided by the King.

The Telegraph Department,
Christiania.....19

SCHEDULE.

System	Type of Installation.	Normal range (by day).	Wave-lengths (the normal wave to be underlined).	Description of Power Supply.	Description of Transmitting and Receiving Instruments. (Detailed sketch of connections attached.)	Type of Aerial (Sketch with measurements attached).	Description of Emergency Gear for ship stations of 1st and 2nd classes. (Detailed sketch of connections attached.)	Remarks

CERTIFICATE.

E It is hereby testified, that..... has in a satisfactory manner stood the test for radiotelegraphists, ordered by the Telegraph Administration, comprising:—

(a) Management of apparatus, and knowledge of their action.

(b) Transmitting and receiving by the ear with the speed ordered for a certificate of..... Class.

(c) Regulations.

With reference to above, and as..... has made the promise of secrecy fixed for telegraph officials, there is hereby given to..... a certificate of..... Class, as radiotelegraphist on board ships.

The Telegraph Administration, Kristiania, the.....

AGREEMENT

REGARDING CERTAIN EXCEPTIONS TO THE PROVISIONS OF ARTICLE XXXV OF THE SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPH CONVENTION.

F With a view to securing a more expeditious forwarding of radiotelegrams from a ship to its homeland, the following Agreement has been concluded between the Royal Norwegian, the Royal Danish, and the Royal Swedish Telegraph Administrations, subject to the necessary sanctions:—

Notwithstanding what is stipulated in Article XXXV para. 1 of the service regulations annexed to the International Radiotelegraph

Convention, according to which a ship station shall as a rule send its radiotelegrams to the nearest coast station, radiotelegraph stations on board ship flying the Norwegian, Danish or Swedish flag are entitled to send to the nearest coast station of the ship's homeland such radiotelegrams as are addressed to that country subject to the following conditions:—

1. That the ship is at least 25 nautical miles from any other coast station open for general correspondence.

2. That the ship's distance from the coast station concerned is not greater than the distance from any other coast station situated in a country other than Norway, Denmark or Sweden and open for general correspondence.

3. That transmissions cease immediately at the request of a nearer coast station whose correspondence is being disturbed by such transmissions, and

4. That the provisions of the International Radiotelegraph Convention and the annexed Service Regulations be maintained in other respects.

This Agreement which is executed in three copies and in each of three countries' languages comes into force on the 1st January, 1921, and shall remain in force indefinitely and until three months from the day on which it shall have been determined by one of the contracting parties.

Christiania, the..... December, 1920.

The Royal Norwegian Telegraph Administration.

Copenhagen, the..... December, 1920.

The Royal Danish Telegraph Administration.

The Stockholm, the..... December, 1920.

Royal Swedish Telegraph Administration.

NYASALAND PROTECTORATE

(See also Map Section)

THIS Colony was constituted on May 14th, 1891, as the "British Central Africa" Protectorate, and so remained until 1907, when it assumed its present appellation. Its area covers 39,573 square miles, with a population of 1,201,519.

It is administered (under the Colonial Office) by the Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

ADMINISTRATION.

Wireless Telegraphy is not at present in operation, although provision has been made in the Statute Book for its regulation if ever it be introduced, as follows —

WIRELESS ORDINANCE, 1908.

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1908."

2. No person shall establish or use any apparatus or installation for the purpose of operating wireless telegraphs without a license from the Governor.

Any person contravening this section shall be liable on conviction to a fine not exceeding £100 or to imprisonment with or without hard labour for a term not exceeding twelve months with or without the option of a fine, and in addition any apparatus or installations in respect of which an offence under this section is

committed may be forfeited and sold or disposed of as the Governor may direct.

3. The Governor in Council may from time to time make, and when made shall publish in the *Gazette*, rules prescribing the terms and conditions upon which licenses to establish or use apparatus or installations for the purpose of operating wireless telegraphs may be granted, and may impose a penalty on conviction for breach of any rules so made of a fine not exceeding £50 or imprisonment with or without hard labour for a term not exceeding six months with or without the option of a fine, and such Rules may further provide for forfeiture and sale or disposal as the Governor may direct of any such apparatus or installations as aforesaid

PACIFIC ISLANDS

(See also Map Section)

Including :

BRITISH—Tonga (Friendly Islands), Ducie Islands, Gilbert and Ellice Islands Colony, British Solomon Islands, Starbuck Islands, Malden Island, Baker Islands, Palmyra.

JAPANESE—The Marianne (Ladrone) Islands, The Caroline Islands, Marshall Islands.

TONGA ISLANDS

(Friendly Islands)

THIS group remained, until 1899, a neutral territory in accordance with the Declaration of Berlin, April 6th, 1886. Under the terms of the Anglo-German Agreement (November 14th, 1899), subsequently accepted by the United States, the Tonga Islands fell practically under the protectorate of Great Britain, which was proclaimed on May 19th, 1900. The present Sovereign is Queen Salote, who is assisted by a Legislative Assembly.

The area of these islands is 385 square miles with a population of 23,562.

CONTROL.

A department of Telegraphs and Telephones was inaugurated at the time of the erection of the wireless station, under whose jurisdiction fall all matters concerning radiotelegraphy and telephony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. J. R. Land	Officer in Charge of Telegraphs and Telephones ..	Nukualofa
—	Assistant Wireless Officer	Nukualofa

The station of Nukualofa is owned and controlled by the Tongan Government and handles commercial traffic.

ORGANISATION.

Nukualofa Radio (the only station yet erected in the Friendly Islands) was opened for commercial traffic on December 30th, 1919. The station works with Suva (Fiji), Apia (Samoa) and ships. It was equipped by the Amalgamated Wireless (Australasia), Ltd.

Telegrams are delivered between the hours of 9 a.m. and 4 p.m. No portorage charge is imposed on delivered telegrams. These are delivered within a one-mile radius of the wireless station. Telegrams for persons residing outside the mile radius are either posted to the addressee or delivered to an authorised agent residing within the mile radius.

No form of license is issued, there being at present no amateurs or experimenters in the Kingdom.

There are no time, press, aviation or direction finding services.

No regular system of broadcasting meteorological reports is in vogue, but when conditions demand it, weather reports are sent out for the information of all stations. All meteorological telegrams are handled free of charge.

ADMINISTRATION.

As regards the European population, Tonga comes under King's Regulation No. IX of 1912. (*See* Gilbert and Ellice Colony.) The use of wireless stations on merchant ships is controlled by the "Wireless Telegraphy Rules, 1917," made under the above-mentioned King's Regulation. An Ordinance is in effect regulating the use of wireless by Tongan natives.

A—An Ordinance to govern the use of wireless telegraphy in the Kingdom of Tonga. (No. 5 of 1918.)

AN ORDINANCE

TO GOVERN THE USE OF WIRELESS TELEGRAPHY IN THE KINGDOM OF TONGA. (No. 5 of 1918.)

A Be it enacted by the King by the advice and with the consent of the Privy Council as follows :—

1. The short title of this Ordinance shall be The Wireless Telegraphy Ordinance, 1918.

2. It shall not be lawful for any Tongan to establish maintain or use in the Kingdom of Tonga any apparatus or instrument for the purpose of electrical communication by means of wireless telegraphy without having previously obtained from the Privy Council a license in that behalf to be granted on such terms and conditions as may be prescribed by any rules made under this Ordinance and on such other terms and conditions as the Privy Council may from time to time think fit to prescribe.

3. It shall be lawful for His Majesty the King in Council from time to time to make rules :—

(a) Prescribing the manner in which licenses under this Ordinance are to be

applied for and granted and the fees payable on the grant of such license.

(b) Generally for the purpose of carrying this Ordinance into effect.

4. Any person who contravenes the provisions of this Ordinance or of any rules made hereunder or fails to observe or perform the terms or conditions of a license granted hereunder or prescribed by any rules aforesaid shall be liable on conviction to a fine not exceeding fifty pounds or in default of payment to imprisonment for any term not exceeding six months and the apparatus or instrument in respect of which such conviction was obtained may by order of the magistrate before whom such conviction was obtained be forfeited.

5. All proceedings under this Ordinance may be taken before a Police Magistrate and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on conviction before a Police Magistrate.

March 5th, 1918.

DUCIE, PITCAIRN, PHOENIX ISLANDS GROUP

UNDER the control of the High Commissioner for the Western Pacific, the affairs of these islands are conducted by local councils. They are of small dimensions and thinly inhabited.

CONTROL AND ORGANISATION.

As far as we are aware wireless has no part in the affairs of these islands.

GILBERT AND ELLICE ISLANDS COLONY

THE Gilbert Islands were declared a British Protectorate on the 27th May, 1892, followed by the Ellice Islands in September of the same year, and named the "Gilbert and Ellice Islands Protectorate." The jurisdiction of the Resident Commissioner of the Protectorate was extended to the Ocean Island on the 28th November, 1900.

By the "Gilbert and Ellice Order in Council, 1915," the aforesaid Islands, together with all small islands, islets, rocks and reefs, depending on them, shall be annexed to and form part of His Majesty's Dominions, and shall be known as the "Gilbert and Ellice Islands Colony." The Administration of the Group is vested in a Resident Commissioner, who is responsible to The High Commissioner for the Western Pacific, with headquarters on Ocean Island.

The group comprises 31 islands, with a number of islets depending upon them, and lies between latitude 4° N. and 10° S.; its longitude being 169° E. to 158° W. The total area approximates to 200 square miles with a population of about 32,000.

CONTROL AND ORGANISATION.

Radiotelegraphy is a Government monopoly, though licenses may be granted for private erection and working. There are three wireless stations in the group, viz.: Ocean Island, Fanning, and Washington Islands. The two latter stations, which are privately owned by the Fanning and Washington Islands Trading Company, and licensed by this Colony, are not at present in operation.

Ocean Island is the only Government land station, being operated and controlled by the Government of the Colony. It comprises a Marconi standard 5 kW. set and modern amplifying valve receivers.

Both day and night communication was established with Suva, Fiji, in January, 1920, and an efficient service has been maintained since. In addition this station works with Tulagi and Nauru. 1,650 metre wave is used with all land stations, and 600 metres for ship working.

The times of working are as follows:—

Tulagi—Once daily, 9.15 a.m. until clear.

Nauru—9.45 a.m., 3.45 p.m. and 7.45 p.m. until clear.

Suva, Fiji—10.30 a.m. and 8 p.m. until clear.

Ships—9.30 a.m., 3.30 p.m. and 7.30 p.m.

Time—Standard of meridian 170° East.

There are no existing or projected stations designed for aviation or meteorological purposes and no time or weather programme is in force at any of the existing stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. L. G. Tilford	Officer in Charge	Ocean Island

ADMINISTRATION.

The following are the rules and regulations at present in force:—

A—King's Regulation No. IX of 1912.

B—Rules under the provisions thereof.

KING'S REGULATION No. IX OF 1912.

TO GOVERN THE USE OF WIRELESS TELEGRAPHY IN THE WESTERN PACIFIC.

A 1. This Regulation may be cited as "The Wireless Telegraphy Regulation, 1912."

2. The Wireless Telegraphy Regulation, 1907, is hereby repealed.

3. (1) It shall not be lawful for any person to establish, install or use any apparatus for the purpose of electrical communication by means of wireless telegraphy in any protectorates, islands, or places within the jurisdiction of the High Commissioner for the Western Pacific specified in the schedule hereto without a license to do so first obtained from the said High Commissioner.

(2) A license under this section shall be subject to such terms and conditions as may be prescribed by any rules made under this regulation and to such other terms and conditions as the High Commissioner may from time to time prescribe.

4. The High Commissioner may make rules from time to time to carry out the provisions of this regulation and in particular to regulate the use of apparatus for wireless telegraphy on board merchant ships, whether British or foreign vessels, while in the territorial waters of the protectorates or islands or places aforesaid.

5. Any person who contravenes the provisions of this Regulation or of any rules made hereunder, or fails to observe and perform the terms and conditions of a license granted

by the High Commissioner hereunder or prescribed by any rules aforesaid, shall be liable to a penalty not exceeding one hundred pounds and to the forfeiture of any apparatus established, installed or used for the purpose aforesaid.

6. This Regulation shall not apply to the islands of the Pacific Ocean known as the New Hebrides, including the Banks Islands and Torres Islands.

SCHEDULE.

The British Solomon Islands Protectorate, The Gilbert and Ellice Islands Protectorate, The Union (Tokelau) Islands, The Phoenix Islands, Fanning Island, Washington Island, Christmas Island and all other islands in the Western Pacific not being within the jurisdiction of the Commonwealth of Australia or any of the states thereof or of the Dominion of New Zealand or of any civilised Power.

B RULES TO REGULATE THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS IN THE WESTERN PACIFIC, MADE BY THE HIGH COMMISSIONER UNDER THE PROVISIONS OF THE WIRELESS TELEGRAPHY REGULATION, 1912.

1. These rules may be cited as the Wireless Telegraphy Rules, 1917.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the protectorates, islands and places specified in the Schedule to the Wireless Telegraphy Regulation, 1912, shall be worked in such a way as not to interfere with—

- (a) Naval signalling; and
 (b) The working of any wireless telegraph station, lawfully established, installed or worked in those protectorates, islands or places or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. (a) The apparatus for wireless telegraphy on board a merchant ship shall not be worked whilst such ship is within a harbour in any colony, protectorate or island specified in the Schedule to the Wireless Telegraphy Regulation, 1912.

(b) For the proper enforcement of the above every ship of British register in any such harbour shall completely disconnect its aerial wires from its radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

(c) Every ship of foreign register in any such harbour shall, subject to the provisions of the following subsection (d) take down its aerial wires completely and disconnect the same from its radiotelegraph apparatus.

(d) A ship of foreign register remaining in any such harbour for less than twelve hours, may, at the discretion of the Resident Commissioner or other Government officer in charge of the colony, protectorate or island to which such harbour belongs, be permitted to leave its aerials up, provided the same are disconnected in accordance with the provisions of subsection (b) of this rule.

4. If at any time, in the opinion of the High Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters aforesaid shall be subject to such further rules as may be made by the High Commissioner from time to time, and those rules may prohibit or regulate that use in all cases or in such cases as may be deemed desirable.

5. It shall be the duty of the master of a ship to see that the requirements of these rules are carried out.

6. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. The rules made on December 16th, 1912, are hereby repealed.

Dated this twenty-ninth day of August 1917.

BRITISH SOLOMAN ISLANDS

THIS group comprises an area of 11,000 square miles with a population of 150,750, and is under British protection.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in this group. For the remainder of the Solomon Islands see under New Guinea.

STARBUCK, MALDEN, JARVIS, PALMYRA AND BAKER ISLANDS

THESE islands are mostly of coral formation; they have a small area, and are very thinly populated.

CONTROL AND ORGANISATION.

As far as we are aware wireless has no part in the affairs of these islands.

MARIANNE, (LADRONE), CAROLINE, MARSHALL ISLANDS

BY the Treaty of Versailles Japan obtained mandatory of the former German possessions north of the equator, their population being largely Japanese.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in these islands.

PALESTINE

(See also Map Section)

AFTER its conquest in 1917-18 by the British forces, the country remained until July 1st, 1920, under British Military Administration, when a High Commissioner was appointed, and a Civil Administration set up.

The boundaries (political) are not yet entirely delimited, but are approximately shown in the map.

The area is about 9,000 square miles, and the population approximately 770,000.

CONTROL AND ORGANISATION.

There are no Government or commercial wireless stations in the country. Wireless traffic is transmitted via Egypt, the charges being similar to those in force in Lower Egypt, with the addition of a terminal charge at the usual international rates.

PANAMA

(See also Map Section)

Including : Panama Republic, Panama Canal Zone.

PANAMA, formerly a department of the Republic of Colombia, asserted its independence on November 3rd, 1903. It has an area of 32,380 square miles and a population (excluding the Canal Zone) of 401,428.

The idea of a Canal through the Isthmus of Panama originated with a Spanish engineer in 1530. Monsieur de Lesseps laboured on its construction from 1882 to 1894, when the United States Government took over the undertaking, and by a treaty between the United States and Panama of November 18th, 1903, the latter granted to the United States in perpetuity a strip of land 10 miles in width, extending across the Isthmus a distance of 50 miles. The rights of sovereignty are vested in the U.S.A. under a Treaty signed on February 26th, 1904.

The zone is ruled by a Governor, who reports through the Secretary of War to the President and conducts the government according to the authority invested in him by Acts of Congress and Executive orders. In periods of crisis or times of war the supreme command is vested in the Commanding Officer of the Troops, designated as the Panama Canal Department of the U.S.A. Army. The American Canal was opened for traffic on August 15th, 1914.

CONTROL.

Radiotelegraphy in the zone is administered by the Navy Department of the United States. All wireless stations on the Isthmus are under control of the Commandant, 15th Naval District, Balboa Heights, Canal Zone, and under the immediate supervision of the Communication Superintendent, 15th Naval District.

Under agreement between the Republic of Panama and the United States of America Radiotelegraphic Communication within the Republic, as well as in the Canal Zone, remains under the control of the U.S.A. This arrangement rests on Decree No. 130 of August 29th, 1914, signed by the President of the Panama Republic.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Capt. L. R. Sargent, U.S.N.	Marine Superintendent Panama Canal and Commandant 15th U.S. Naval District	Balboa Heights
Lt.-Com. F. L. Riefkohl ..	Communication Superintendent 15th U.S. Naval District	Balboa Radio Station Fort Amador

ORGANISATION.

The first radio station erected was situated in the Republic of Panama within the municipal limits of the City of Colon, in 1906, and the reservation there established is still the site of a successor to this pioneer station.

The small station established at Porto Bello, Panama, in 1909, was closed on May 13th, 1914. The Colon station, established on March 1st, 1910, was re-equipped with improved apparatus, and opened to commercial traffic in January, 1913. At Balboa (Pacific end of the Canal) there stands a station opened for commercial business in June, 1913, and replaced by an improved installation on the same site in 1914. The well-known "Darien" station

(located alongside the Canal, midway between the oceans) is a high-power installation, designed primarily for communication with Washington and for naval vessels at sea. It possesses a sending radius of 3,000 miles, and was placed in regular service on April 5th, 1915.

The Almirante Radio station belonging to the United Fruit Co., was established in 1921, superseding the Bocas del Toro station.

There is a Naval Radio Station for communication with aircraft at the Naval Air Station, Coco Solo, C.Z. It is contemplated to install a radio telephone transmitter at that station some time in the near future, which will be available for use in handling commercial traffic. No definite information is available as to the time when this set will be installed.

There have been some developments not shown above, but no information concerning them has yet been disclosed.

There are no wireless clubs or radio societies, the whole of the wireless operations being controlled and administered by the U.S. Navy.

An unofficial news service for the benefit of persons at sea is carried on by the Colon station, which each day at 3.30 p.m. radiates broadcast about 200 words of news made up of extracts from the Panama morning papers, whilst Press despatches obtained by radio from the United States are re-broadcasted at 5 a.m. by Balboa (NBA) on 7,000 metres (arc) and 2,400 metres spark.

ADMINISTRATION.

We publish below the text of the various Acts and Decrees affecting radiotelegraphy in the Canal Zone and the following is the text of a circular relating to radio practice:—

The following is a copy of Circular No. 626-10, issued by the Executive Office, The Panama Canal, February 17th, 1922:—

"Hereafter ships with clean bills of Health, from non-infected ports, and without sickness on board, intending to transit the canal without taking supplies or stores of any kind or landing passengers or cargo, may be granted practice by radio under the following conditions:—

(a) By making application therefor by radio between the hours of 8 a.m. and 4 p.m. Such application to state—

(1) That the vessel has a clean bill of health and has no sickness on board.

(2) Names of ports and places visited within the past ten days.

(3) That the vessel intends to transit the canal without taking stores of any kind or landing passengers or cargo.

(b) Radio will be addressed to Chief Quarantine Office, through port captain.

(c) Practice will not be considered as granted until reply has been received from port captain, 'Chief quarantine officer grants practice.'

A—Act to regulate Radio Communication issued August 13th, 1912.

B—Section 6 of Act to Provide for Opening, Maintenance, Protection and Operation of the Panama Canal (dated August 24th, 1912).

C—Extracts from Rules and Regulations for the Operation and Navigation of the Panama Canal, dated August 15th, 1919.

D—Notice concerning Commercial Service at Naval Stations, dated September 1st, 1913.

E—Circular *re* Compulsory Wireless, dated July 23rd, 1914.

F—Circular *re* Free Radio Service, dated November 17th, 1914.

AN ACT TO REGULATE RADIO COMMUNICATION.

A Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company, or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from

beyond the jurisdiction of the said State or Territory, except under and in accordance with a license, revocable for cause, in that behalf granted by the Secretary of Commerce and Labour upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: Provided, that the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a license shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published

in the list of radio stations of the United States by the Department of Commerce and Labour. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

SEC. 2.—That every such license shall be in such form as the Secretary of Commerce and Labour shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the license is granted; that every such license shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such license shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such licence shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as aforesaid be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce and Labour. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said license for a period to be fixed by the Secretary of Commerce and Labour not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court, for each and every such offence: Provided,

that in case of emergency the Secretary of Commerce and Labour may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the radio ship Act of June twenty-fourth, nineteen hundred and ten.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce and Labour through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce and Labour may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce and Labour may grant special temporary licenses to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

1. *Normal Wavelength.*—Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the international convention in force: Provided, that the Secretary of Commerce and Labour may, in his discretion, change the limit of wavelength reservation made by Regulations 1 and 2 to accord with any international agreement to which the United States is a party.

2. *Other Wavelengths.*—In addition to the normal sending wavelength all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: Provided, that they do not exceed 600 metres or that they do exceed 1,600 metres: Provided further, that the character of the waves emitted conforms to the requirements of Regulations 3 and 4 following.

3. *Use of a "Pure Wave."*—At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemeter, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

4. *Use of a "Sharp Wave."*—At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

5. *Use of "Standard Distress Wave."*—Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force except on vessels of small tonnage unable to have plants insuring that wavelength.

6. *Signal of Distress.*—The distress call used shall be the international signal of distress:—
• • • • •

7. *Use of "Broad Interfering Wave" for Distress Signals.*—When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

8. *Distance Requirement for Distress Signals*—Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in Regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

9. *"Right of Way" for Distress Signals.*—All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

10. *Reduced Power for Ships near a Government Station.*—No station on shipboard, when within fifteen nautical miles of a naval or military station, shall use a transformer input exceeding one kilowatt, nor, when within five nautical miles of such a station, a transformer input exceeding one-half kilowatt, except for sending signals of distress or signals or radiograms relating thereto.

11. *Intercommunication.*—Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station during the hours it is in operation, to listen in at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

12. *Division of Time.*—At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and the character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned

shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce and Labour may, on the recommendation of the Department concerned, designate the station or stations which may be required to observe this division of time.

13. *Government Stations to Observe Division of Time.*—The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

14. *Use of Unnecessary Power.*—In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

15. *General Restrictions on Private Stations.*—No private or commercial station not engaged in the transaction of *bona fide* commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres, or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labour contained in the licence of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of \$100 or \$25, respectively provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

16. *Special Restrictions in the Vicinities of Government Stations.*—No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding one-half kilowatt.

17. *Ship Stations to Communicate with Nearest Shore Station.*—In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

18. *Limitations for Future Installations in Vicinities of Government Stations.*—No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations—to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of

governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin convention of 1906 and future international conventions or treaties to which the United States may be a party, at each of the stations above referred to and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin convention of 1906 and future international conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

19. *Secrecy of Messages.*—No person or persons engaged in or having knowledge of the operation of any station or stations shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed, or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punishable by a fine of not more than \$250 or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the Court.

Penalties.—For violation of any of these regulations, subject to which a license under sections 1 and 2 of this Act may be issued, the owners of the apparatus shall be liable to a penalty of \$100, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any of such regulations the licence may be revoked.

For violation of any of these regulations, except as provided in Regulation 19, subject to which a license under section 3 of this Act may be issued, the operator shall be subject to a penalty of \$25, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any such regulations, the licence shall be suspended or revoked.

SEC. 5.—That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanor, and upon conviction thereof the owner or operator, or both, shall be punishable by a fine of not to exceed \$500 or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any

wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than \$2,500 or imprisonment for not more than five years, or both, in the discretion of the court, for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than \$1,000 or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

SEC. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this act shall apply to apparatus for radio communication on any foreign ship.

SEC. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

SEC. 10.—That this Act shall not apply to the Philippine Islands.

SEC. 11.—That this Act shall take effect and be in force on and after four months from its passage.

Approved, August 13th, 1912.

EXTRACT FROM ACT.

(Dated August 24th, 1912.)

TO PROVIDE FOR OPENING, MAINTENANCE, PROTECTION AND OPERATION OF THE PANAMA CANAL.

B SEC. 6.—That the President is authorised to cause to be erected, maintained, and operated, subject to the International Convention and the Act of Congress to regulate radio communication, at suitable places along the Panama Canal and the coast adjacent to its two terminals, in connection with the operation of the said Canal, such wireless telegraphic installations as he may deem necessary for the operation, maintenance, sanitation, and protection of said Canal, and for other purposes. If it is found necessary to locate such installations upon territory of the Republic of Panama, the President is authorised to make such agreement with said Government as may be necessary, and also to provide for the acceptance and transmission by said system, of all private and commercial messages, and those of the Government of Panama, on such terms and for such tolls as the President may prescribe: *Provided*, That the messages of the Government of the United States and the departments thereof, and the management of the Panama Canal, shall always be given precedence over all other messages. The President is also authorised, in his discretion, to enter into such operating agree-

ments or leases with any private wireless company or companies as may best insure freedom from interference with the wireless telegraphic installations established by the United States.

EXTRACT FROM RULES AND REGULATIONS.

(Dated August 15th, 1919.)

C 40. *Radio Communication.* — As soon as radio communication can be established with the Canal, vessels should report their names, nationality, length, draft, tonnage, whether or not they desire to pass through the Canal, require coal, provisions, supplies, repairs, to go alongside of a wharf, the use of tugs, probable time of arrival, length of stay in port, or any other matters of importance or interest. If this information has been previously communicated through agents or otherwise to the captain of the port, it will not be necessary to report by radio; but the probable time of arrival should always be sent.

41. Control of radio communication is entirely in the hands of the radio shore stations. No vessel will be allowed to interfere in the slightest degree with the Canal radio stations; upon an order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio, even if in the midst of transmission of a message, she shall immediately comply.

42. Upon a ship's arriving within the 15-mile limit, and until leaving the 15-mile limit of the Canal Zone, she shall transmit only with low power, not exceeding one-half kilowatt.

43. Messages to stations will be sent only to Colon station (NAX) when in Gatun Locks and to northward thereof, and only to Balboa station (NBA) when in Miraflores Locks and to southward thereof; between these two points ships may work to either station, preferably to the nearer one; the high-power station (Darien) at Radio will not handle commercial work and will not be called for Canal business except in case of emergency.

44. All messages between ships in the Canal Zone and ships at sea must be forwarded through the nearer shore station.

45. Messages from ships in the Caribbean Sea for ships in the Pacific waters, or *vice versa*, shall be routed through the Canal Zone shore stations.

46. All vessels fitted with radio, after leaving the terminal harbour to pass through the Canal, shall keep an operator on watch until the further terminal harbour has been reached; this applies to the time when they are anchored in Gatun Lake, while passing through the locks, or moored to the lock walls, or to any of the wharves in the Canal proper, as well as when they are under way. Messages relating to the ship's movements and the Canal business shall take precedence over all commercial messages.

47. Pilots on vessels passing through the Canal shall have the right to use a vessel's radio freely for the transaction of the Canal business.

48. Under the direction of the pilots, vessels will from time to time report their progress through the Canal; accidents to machinery, propellers, steering gear, equipment, or anything else that may delay them or require assistance; any sickness or casualties that

require medical attendance from Canal officials; or any other matters of importance that may arise.

49. No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.*

50. No vessel will be allowed to communicate with any lock or signal station while in transit through the Canal, except through the pilot; all messages of any kind must be sent through him. This does not apply to vessels moored at the terminals at Cristobal or Balboa, before entering or after having passed through the Canal, which may wish to communicate through the terminal stations.

51. Vessels in transit through the Canal can communicate with the lock and signal station through the pilots, both by the international code and special signals; information on this subject may be obtained from the Governor of the Panama Canal.

118. In thick and foggy weather vessels will not be allowed to enter the Canal or leave locks or mooring station until the weather has cleared. Vessels in transit, when overtaken by thick or foggy weather, must immediately take every precaution and make preparation to anchor or moor at the first available place, and so remain until the weather clears. Vessels equipped with radio, when overtaken by thick or foggy weather, should immediately so report, in order that the proper fog signals may be made at the mooring stations on the approach of such vessels.

RADIO SERVICE.

Control of Radio.—The United States Government controls radio in the Republic of Panama and contiguous waters. The U.S. Naval Communication Service maintains three Naval Radio Stations in the Canal Zone; coastal stations at Colon and Balboa, and a high-powered station at Darien. In the Republic of Panama it maintains Naval Radio Stations at Cape Mala, La Palma, and Puerto Obaldia. The Cape Mala Radio Station, located at Cape Mala, R. P., at the south-west entrance to the Bay of Panama, is connected by telegraph with the Canal Zone and all telegraph offices in the Republic of Panama. The Radio Stations at La Palma and Puerto Obaldia are located in outlying sections of the Republic of Panama which have no telegraph connections, and are primarily for intercommunication between these districts and other sections of the Republic of Panama and the Canal Zone, through Balboa Radio. Control of radio communication is entirely in the hands of these stations. No vessel will be allowed to interfere in the slightest degree with the Canal radio stations; upon an order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio, even if in the midst of transmission of a message, she shall immediately comply.

Commercial Radiograms.—All Naval Radio stations given above, except Darien, are open to commercial traffic.

Canal Business Radiograms.—With the exception of Darien, all Naval Radio Stations given above will handle Canal business addressed to the proper officials of the Panama Canal, its departments and subsidiary com-

* Canal Zone. Itemised lists not allowed.

* As Amended by Executive Order of November 4th, 1914.

panies. No receiving or forwarding charge will be made by the Naval Radio Stations for this service. The first word in the address of such messages should be "GOVT" (Example: "GOVT Port Captain Cristobal,") to show that they are official messages on Canal business. The shore stations reserve the right to decide whether a message is official or commercial in character.

Stations to be Called.—Ships on the Atlantic side will communicate only with Colon (NAX). Ships on the Pacific within 50 miles of Balboa will communicate only with Balboa (NBA). Ships in the Pacific when more than 50 miles from Balboa will communicate with Cape Mala (NNT), from which station messages are relayed to the Canal Zone or Republic of Panama by telegraph. Ships in the Canal, when to the Northward of Darien will work Colon (NAX), when to the Southward of Darien work Balboa (NBA).

Ships will communicate through nearest shore station. On arriving within range of a shore station ships should send a (TR) position report, furnishing data required by Article 28, Service Regulations Affixed to the International Radiotelegraphic Convention, London, 1912. Due to the large amount of radio work in the vicinity of the Canal, and the necessity of reducing interference to a minimum, ships should send the required position report whether they have messages to transmit or not. This is desired in order that the calling of vessels by shore stations having messages for such ships may be reduced to a minimum. Upon receiving a position report from a ship, the shore station will know that the ship is in range and will immediately deliver any messages on file for that ship. Any ship which desires to communicate with a shore station, and has not previously submitted a (TR) report to that station, will be requested to submit such report before any messages are accepted from it.

All TR reports received are given to the Port Captain concerned and to the vessel's agents (if known).

Balboa Radio (NBA) is a distant control (Receiving) station, therefore, in case of emergency, Balboa Radio may be called and communication with it established, though Balboa may at the time be transmitting.

Hours of Service.—Colon, Balboa, and Cape Mala maintain a constant watch, day and night.

La Palma and Puerto Obaldia maintain daily schedules of watches.

EXTRACT FROM SUPPLEMENT TO RULES.

(Dated September 1st, 1913.)

COMMERCIAL SERVICE AT NAVAL RADIO STATIONS.

D Beginning September 1st, 1913, the radio stations of the United States Navy at Colon and Balboa are handling special classes of commercial radiograms, heretofore prohibited, as follows:—

1. Reply paid messages (where both message and answer can be prepaid by the sender).

2. Messages calling for repetition of messages (for verification only). Charge for repeating back is one-fourth the charge for the original message.

3. Radiograms to be delivered by mail. (If received from a ship, these will be mailed from the radio station. "Ocean letters" will be mailed by the ship at the first port of call, or at any port of call designated).

4. Multiple radiograms. These are messages addressed either to several persons at same address or to same person at several addresses served by the same radio station. These messages when received from sea will be separated and sent as so many individual messages over the land wire.

5. Radiograms calling for acknowledgment of receipt. (Such acknowledgment is restricted to notification of date and hour at which the coast station delivered the radiogram to ship addressed; and may be sent by either mail or telegram).

6. Paid service notices. (Sent in order to correct address or text to cancel a message, etc.)

Both stations, Colon and Balboa, are connected by direct wire with the Panama railroad telephone system and radiograms can be filed at any local office. Attention is invited to the fact that no collect messages are handled, and no commercial messages are handled, between stations which are connected by cable or telegraph, as, for instance, to Key West or Port Lincoln.

The time of arrival of all Panama railroad boats is given to the telephone control at Colon as soon as received, and can be obtained there upon request without calling the radio station at Colon.

E EXECUTIVE ORDER. WIRELESS APPARATUS ON OCEAN-GOING VESSELS.

Published in Circular No. 601-16, dated Culebra, C.Z., July 23rd, 1914.

To Require Ocean-going Vessels to be Fitted with Wireless Apparatus.

By virtue of the authority vested in me, I hereby establish the following order for the Canal Zone:—

Sec. 1.—From and after the first day of July, 1915, it shall be unlawful for any ocean-going steamer of the United States, or of any foreign country, carrying fifty or more persons including passengers and crew, to leave or attempt to leave any port of the Canal Zone unless such steamer shall be equipped with an efficient apparatus for radio communication in good working order in charge of a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages for a distance of at least 100 miles, night or day: *Provided*, That the provisions of this order, shall not apply to steamers plying only between the Canal Zone and ports less than 200 miles therefrom.

Sec. 2.—The master or other person being in charge of such vessel which leaves or attempts to leave any port of the Canal Zone in violation of any of the provisions of this order shall, upon conviction, be fined in a sum not to exceed Five Thousand Dollars (\$5,000), and any such fine shall be a lien upon such vessel, and the vessel may be liable therefor in the District Court of the Canal Zone, and

the leaving or attempting to leave by any vessel from each and every port of the Canal Zone shall constitute a separate offence.

SEC. 3.—This order shall take effect from and after this date July 9th, 1914.

EXECUTIVE ORDER.

FREE RADIO SERVICE FOR CANAL BUSINESS.

Published in Circular No. 601-33, dated Balboa Heights, C.Z., November 17th, 1914.

Amending Paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under its Jurisdiction."

F By virtue of the authority vested in me under the Panama Canal Act, paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under Its Jurisdiction," promulgated by Executive Order No. 1990, dated July 9th, 1914, is hereby amended to read as follows:—

49.—No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.

PARAGUAY

(See also Map Section)

THE inland republic of South America known as Paraguay is divided into two distinct portions by the river bearing the same name. The first Spanish Colony was settled in 1535, and the country remained under Spanish rule until 1811. After a number of vicissitudes, the present constitution was proclaimed on the 25th November, 1870. The legislative authority is vested in a Congress of two houses, the executive being entrusted to a President, assisted by five ministers. It has an area of 75,673 square miles and a population estimated at 1,050,000.

CONTROL.

There are three wireless stations in Paraguay at present open to the public, their control being vested in the Director of Posts and Telegraphs. These stations are situated at Asuncion, the capital of the Republic (or—more strictly—Lambaré, on the outskirts thereof), Concepcion, and Encarnacion. They are identical in capacity and possess a radius of 300 miles by day and 600 miles by night. They were erected by Siemens Schuckert in accordance with a contract made with that firm and the Paraguayan Government in 1913. The Asuncion (Lambaré) station was completed in December, 1914, that at Concepcion in March, 1915, and that at Encarnacion was taken over by the Government in February, 1916.

There are no privately owned stations. The Government has instituted a wireless telegraph school which is attached to the College of Military and Naval Cadets.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Luis A. Riart	Minister of Interior	Avenida Colombia, Asuncion
(Vacant)	Director-General of Posts and Telegraphs	Calle Yegros, Esq. Bermejo, Asuncion
Juan B. Tendil	Head of Telegraph Office	431 Calle Oliva, Asuncion
Francisco Fernandez ..	Technical Inspector	Calle 14 de Julio, Asuncion

ORGANISATION.

The Paraguayan wireless service is at present confined to the interior of the country, for the Governments of Paraguay and Argentina have not yet been able to come to a working agreement for the maintenance of a public service. An agreement, however, has been entered into by the two Governments to use wireless as an auxiliary to relieve congestion or breakdown of the line system.

The three Government installations are not confined to a specific Government service, but are available for the public service within the country, and occasionally, on emergency, for communication with the exterior.

The War Department have seven subsidiary, or portable, installations for use at the five military centres and on the armed patrol steamers.

ADMINISTRATION.

There are no special laws or regulations affecting the subject, but the text of the Convention referred to above will be found below.

A—Convention between Paraguay and Argentina.

CONVENTION.

A The following is the text of a Convention entered into between the Governments of Paraguay and the Argentine Republic.

Date of the Convention,
November 15th, 1918.

Plenipotentiaries—

For Paraguay: Dr. Eusebio Ayala.

For Argentina: Dr. José Maria Cantilo.

After an interchange of credentials, which were found in order, the following agreement was signed, the object of which is to facilitate communication between the two countries mentioned.

1. For the telegraphic interchange between Argentina and Paraguay radiotelegraphic methods will be used as an auxiliary whenever—owing to the amount of traffic or breakdowns in the terrestrial lines—it may become necessary to use wireless in order to maintain an uninterrupted service.

2. Both the Argentina and the Paraguay offices will use for the exchange of messages the Posadas and Formosa stations, one at a time, or the two if necessary. The two manage-

ments will see to it that the traffic is distributed in such a way as to ensure the quickest service between the hours between 12 noon and 12 midnight, Argentine time. The wavelengths will be of the standard damped type of 600 metres.

3. Whenever it is required, and should it be impossible to carry through the exchange over the stations named in the preceding article, the service may be taken off directly between Buenos Aires and Asuncion.

4. In all matters referring to transmission rates, accounts and service regulations, the Argentine and Paraguay regulations at present in force in the telegraphic service will apply.

5. This Convention will come into effect thirty days after its ratification by the contracting parties, and either party may withdraw at any time by giving 90 days' notice previous to the date when the suspension of the service is intended to take effect.

This Convention is made out in duplicate and signed by the two plenipotentiaries whose seals have been affixed, and they have agreed that the exchange of the ratification will take place in the city of Asuncion within thirty days from this date.

PERSIA

(See also Map Section)

WITH a constitution similar to that of Turkish rule, Persia is ruled by a Shah, Sultan Ahmad Shad. The country is divided into 33 provinces, each under a Governor-General, directly responsible to the government.

The total area of this desert land is about 628,000 square miles and the population between eight and ten million.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Persia.

PERSIAN GULF

(See also Map Section)

Including: Oman, Bahrein Islands, Aden, Perim, Sokotra, and the Kuria Murai Islands.

OMAN is an independent State in South-Eastern Arabia, whose integrity has been guaranteed by Great Britain and France. It extends along the southern shore of the gulf for about 1,000 miles. It has an area of 82,000 square miles and a population estimated at 500,000. Sultan Seygid Taimur bin Feysil is the reigning head.

The Bahrein Islands are a group situated in the Gulf 20 miles off the coast of El Hasa in Arabia, they have an area of about 300 square miles and support a population of about 110,000.

Aden is a volcanic peninsula on the Arabian Coast, and is an important coaling station for ships voyaging to and from the east. With Perim at the entrance to the Red Sea and the Kuria Muria Islands, the protectorate comprises some 9,000 square miles and supports a population of 54,923.

The Island of Sokotra, off the coast of Africa, is under British Protection, and has an area of 1,382 square miles with a population of 12,000.

CONTROL AND ORGANISATION.

A small Lodge-Muirhead Station was erected in 1910 at Jask, by the Indian Telegraph Department. It was transferred later to Lingah where it is now worked by the Indo-European Telegraph Department.

The India Telegraph Department in 1914-15, erected Marconi Stations at Bahrein (5-kW.), Bushire (5-kW.) and Henjam (3-kW.). When complete they were handed over to the Indo-European Telegraph Department, who maintains and works them.

PERU

(See also Map Section)

THE Republic of Peru, formerly the most important Spanish Vice-royalty in South America, declared its independence on July 28th, 1821, but was not actually free until three years later. Its new constitution was proclaimed on February 4th, 1920, and entrusts the new executive power to a President, the legislation being in the hands of a Senate and House of Representatives. Territorially it is divided into twenty departments and three littoral provinces, the total area being estimated at 722,461 square miles, with a population of about 4,620,201. The capital city is Lima, which is closely connected with Callao, its port on the Pacific coast.

CONTROL.

The control of radiotelegraphy is directed by the Minister of the Interior.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.		Title.	Address.
Sir William Slingo .. ..	..	Administrator-General of Posts and Telegraphs ..	Lima
Mr. S. R. Groser .. ..	..	Engineer-in-Chief of the Radiotelegraphic Service ..	Lima

ADMINISTRATION.

There are fifteen radiotelegraphic stations open to public service in Peru, but no special legislation has been issued, the wireless service being subject to the same regulations as the ordinary wired service, differing therefrom only with regard to rates.

The Radio Service has hitherto been a State monopoly and there are no forms of license in existence.

By virtue of an agreement with the Peruvian Government, Marconi's Wireless Telegraph Co., Ltd., on May 1st, 1921, took over the administration of the Postal Telegraph and Radiotelegraphic Services of the Republic and will operate them for a period of twenty-five years, Sir William Slingo, late Engineer-in-Chief of the British Post Office, having been appointed Administrator-General of Services.

The concession includes the sole and exclusive operation of all national and international wireless telegraph stations within the Republic and the exclusive right to erect any further wireless stations that may be necessary.

In accordance with the terms of the above agreement a programme of reconstruction and reorganisation of the Radio Service is in preparation, and it is anticipated that new laws and regulations affecting radiotelegraphy will in due course be drawn up.

There are at present no time, weather, meteorological, hydrographic or press services.

PHILIPPINE ISLANDS

(See also Map Section)

THE Philippine Islands form a part of the great archipelago known as the East Indies. They lie south-east of the continent of Asia, nearly south of the Japanese Empire, and north of Borneo and Celebes; between the meridians of $116^{\circ} 40'$ and $126^{\circ} 34'$ E. longitude, and between the parallels of $4^{\circ} 40'$ and $21^{\circ} 10'$ N. latitude. The boundaries and the limits of the group are set forth in the paragraph concerning limits in the Treaty of Paris between the United States and Spain, of December 10th, 1898.

In addition to the lands thus delimited, the United States subsequently acquired from Spain the little group of islands known as Cagayan Sulu, and nine other small islands, lying off the north coast of Borneo.

The Philippine Islands have an area of 114,400 square miles, and are made up of 7,083 islands. They have a population of 10,350,730. Considering the Philippine Archipelago by itself, it may be regarded as having the form of a triangle, open at the base and with its most acute angle pointing northward, this being represented by northern Luzon and the Batan and Babuyan Islands. The western leg of the triangle is represented by Palawan and dependent islands, and the eastern one by the Visayan Islands and Mindanao, with the Sulu sea lying between them.

CONTROL.

Several of the stations now operated by the Philippine Insular Government were originally erected by the Signal Corps, United States Army, when that corps operated the telegraph and cable lines of the Philippines, but with the rest of the telegraph system of the Philippine Islands they were during the period from 1903 to 1907 gradually turned over to the Civil Government, the entire telegraph system, other than military lines and wireless stations, being now controlled by the Insular Government and forming a part of the Bureau of Posts.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
<i>U.S. Army and Naval Stations</i>		
Lieut. T. N. Alford. . .	Philippine Communication Superintendent . . .	Manila
<i>Insular Government Stations</i>		
Hon. Mr. D. Jakosalem . .	Secretary of Commerce and Communications . .	Manila
Mr. José Topacio . . .	Director of Posts . . .	Manila
Mr. W. H. Howard. . .	Radio Engineer and Technical Adviser . . .	Manila
Mr. V. P. Villanueva . .	Electrical Engineer of the Bureau of Posts . .	Manila

ORGANISATION.

Nearly all of the commercial wireless traffic of the Philippines is between shore stations, which form an integral part of the telegraph system of the Insular Government.

The Continental Morse alphabet is used for wireless, and the American Morse alphabet for land and cable lines; and the radio laws and regulations of the United States are conformed to as far as local conditions permit. The service is operated and maintained almost entirely by Filipinos.

There are no wireless societies nor amateur or privately owned stations on record in the Philippines. There is one ship station on a Government owned vessel, and several ship stations on privately owned vessels.

There are seventeen land stations open for general public service, and some of the stations operated by the United States Army and Navy are open to ship and foreign traffic, ten of them being operated by the Bureau of Posts. These include five operated by the United States Army or Navy, but not ship stations licensed by the United States Government.

An American manufacturing concern has established a radio broadcasting service for both telegraph and telephone. The range is 600 miles, and is in daily operation.

The Philippine Insular Government has an extensive programme for the erection of additional wireless stations, and the erection of 18 in different parts of the archipelago is now under way.

The Bureau of Posts stations are designed strictly for commercial business and the relief of the cable system. Therefore, there has been no provision for radio compass stations, nor are there any regulations relative to aviation at present. The Bureau of Posts is, however, taking up the question of aerial mail service between the various islands, and it is possible that if such should become a reality there would be regulations in force and several radio compass stations erected.

A comprehensive system of time and weather signals is in operation in these islands.

ADMINISTRATION.

At present it is not possible to give the actual text of the laws regarding radio work. They are, however, practically the same as those in force in the United States, with a few exceptions due to local conditions.

Bills similar to the Radio Act and Ship Act of the United States, regulating radio communication and requiring radio apparatus on certain passenger carrying vessels respectively, will soon be presented before the Philippine Legislature for passage.

POLAND

(See also Map Section)

THE historic Kingdom of Poland has recently been restored as a Polish Republic. Its record has been an unhappy one, culminating in its third and last partition between Austria, Prussia and Russia in 1795. It has an approximate area of 149,042 square miles, and a population of 24,272,505.

CONTROL.

Normally the establishment and control of radiotelegraph stations is vested in the Ministry of Posts and Telegraphs Section of Radio Communication, Department III. A State Wireless Telegraph Society has been formed under the control of the Ministry of Posts and Telegraphs for dealing with all matters relative to radiotelegraphy and radiotelephony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Wladislaw Gadomski, Jr. . .	Director of Department	Warsaw.
Eugenjusz Stalinger, Jr. . .	Chief of Radiotelegraphic Section	Warsaw.

The following transmitting stations are now in operation :—

A transatlantic central station just outside the town of Warsaw of 400 kW. (antenna current), was the Alexanderson system, built by the Radio Corporation of America. It is equipped with two Alexanderson alternators of 210 kW. each and allows of continuous communication with Rocky Point Station, America.

In Warsaw a 10-kW. station and a 1-kW. valve station for internal communication, together with a 5-kW. telephone station for scientific and meteorological purposes.

At Grudziadz, for European communication, a 10-kW. station.

At Posen a 4-kW. Poulsen arc station and an 8-kW. valve station.

At Cracow a 4-kW. Poulsen arc station is under construction.

At Danzig there is a 1-kW. station.

Plans have been prepared for the erection of transmitting stations for interior and aerial services at Wilno, Lublin, Livóu, Katowice and Lodz, and the existing stations at Cracow and Danzig are being fitted with valve transmitters.

Receiving stations fitted with a "frame antenna" and valve transmitting apparatus, made in Poland by the United Wireless Telegraphy and Telephony Society, are in operation.

Commercial and amateur radiotelegraphy is being considered, and a law is being prepared on this subject.

ADMINISTRATION.

The existing rules and regulations respecting the wireless service are of a temporary nature. They will soon be replaced by regulations established by the civil authorities.

PORTO RICO

(See also Map Section)

THE island of the "Greater Antilles" group in the West Indies known under the Spanish name of Rich Harbour lies with regard to latitude between $17^{\circ} 50'$ and $18^{\circ} 30'$ N.; its longitude ranging from $65^{\circ} 30'$ to $67^{\circ} 15'$ W., and its total area comprising 3,606 square miles. The capital, San Juan, is 1,400 miles from New York and 982 from Key West, Florida. It is administered by a Governor appointed by the President of the United States, with a Cabinet and a Senate and a House of Representatives elected for four years. Its population is 1,299,809.

CONTROL AND ORGANISATION.

The regulation of wireless telegraphy rests in the hands of the Department of Commerce for private stations and in the hands of the United States Navy Department for the Naval Section. No clubs or societies exist in the island. There are private stations worked by the South Porto Rico Sugar Company of Porto Rico (sugar factory), at Ensenada, P.R., connecting with Central Romana (a similar company in the Republic of Santo Domingo). The Ensenada station, owned by the South Porto Rico Sugar Company, is being operated under a general commercial license granted by the U.S. Navy Department, Washington, D.C. It communicates directly with the Romana station, the Santo Domingo City public station, and San Pedro de Macoris station, in the Republic of Santo Domingo; also with ships at sea.

The radio station at San Juan sends out a meteorological bulletin every night at 9 p.m., 75th meridian time, on 2,750 metres, audible radiation. Hydrographic and emergency weather reports are sent when received and also at 8, 12, 16, and 20, 60th meridian time. No time or press signals are sent.

There are no direction finding stations in Porto Rico at present.

There are two stations belonging to, controlled and operated by, the Navy Department of the United States in Porto Rico, one in the city of San Juan and the other in the city of Cayey, P.R.

ADMINISTRATION.

The Laws and Regulations affecting the Naval Radio Stations in Porto Rico are as follows:—

- The International Radio Convention ;
- The National Radio Laws of the United States ; and the
- Navy Regulations and Communication Instructions.

(See under U.S.A.)

PORTUGAL

(See also Map Section)

Including : Cape Verde Islands, St. Thomé and Principe, Azores.

AN independent State since the twelfth century, "England's Oldest Ally" remained a monarchy till 1910. On October 5th of that year the Republic was proclaimed, and on August 20th, 1911, the present constitution was established. Affairs are administered by a President, the two Chambers reserving to themselves the legislative functions.

Portugal is a country with 5,423,132 inhabitants, and has a superficial area of 35,490 square miles. She claims to be the pioneer colonising nation of the modern world, and her colonies still cover an area of 1,111,572 square miles.

CONTROL.

The radiotelegraphic service in Portugal is a state monopoly. No private individual is allowed to erect or work wireless, and may not even own a simple receiver. The only exception made is that in favour of shipping companies, which are allowed to have wireless stations on board their vessels.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Dr. João Alberto Pereira de Azevedo Neves	Minister of Commerce	Lisbon
Sr. Henrique Jacintho Ferreira de Carvalho	Postmaster-General	Lisbon
Colonel Alvaro Cesar de Mendonça ..	Minister of War	Lisbon
Sr. Manuel Alves de Mattos	Inspector of Telegraphic Military Service	Lisbon
Dr. Alexander de Vasconcellos e Sá ..	Minister of Colonies	Lisbon
Admiral Canto e Castro	Minister of the Navy	Lisbon
Admiral D. Bernardo da Costa	President of the Technical Committee of Torpedoes and Electricity	Lisbon

STATIONS IN PORTUGAL (INCLUDING AZORES).

The experimental stations at the School of Torpedoes and Electricity at Valle de Zebro are confined to the station of the Naval School.

Land stations open for Government traffic only ..	1
Land stations open for public correspondence ..	2
And a number of ship stations open for public correspondence.	

PORTUGUESE EAST AFRICA.

Land stations open for public correspondence ..	3
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CAPE VERDE ISLANDS.

Land stations	4
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ORGANISATION.

Portugal's first experiments in wireless telegraphy date from 1905, and were conducted with two small Telefunken stations on a war vessel and the fortress of Cascaes, by the staff of the Posts and Telegraphs. The results, however, were not very satisfactory. Later on, Alvares, Captain of Engineers, carried out experiments on a small scale with two Decretet stations having coherer receivers. In 1907 the first fixed station was set up at the School of Torpedoes and Electricity at Valle de Zebro (Escola de Torpedos e Electricidade).

With this Naval station a series of experiments were made, and it was here that the first studies in wireless originated, and the first officers and sailors of the Portuguese Marine received instruction.

The whole work of installation, tests, and tuition was directed by the naval officer who, at the time, was the instructor at the School of Torpedoes and Electricity, and who was in charge of the Wireless Telegraphy Department.

Nowadays the School of Torpedoes and Electricity at Valle de Zebro, besides having the old apparatus for instruction, possesses a complete Marconi station with all the receivers used in the Navy, and continues to be a Naval School for officers and sailors.

Radiotelegraphy has made considerable headway, especially in the Portuguese Colonies.

The Government has ratified an agreement with the Marconi Company for the erection of radio stations at Lisbon, Madeira, Angola, Mozambique and the Cape Verde Islands.

A concession has been granted for 40 years for the exploitation of these stations on the condition that the administration shall be composed, in the majority, of Portuguese citizens.

Contracts have been entered into between the Colonial Office and the Marconi Company for stations at Timor (Java) and a network of stations at Angola (West Africa). A complete system of installations has been arranged for São Thomé (Gulf of Guinea) and for Mozambique (East Africa). The present Minister of Colonies, Dr. Alexandre de Vasconcellos e Sá, is responsible for the execution of this project.

The Administration of Posts and Telegraphs have also purchased a 5-kW. station for Terceira Island (Azores).

ADMINISTRATION.

The current laws and regulations reprinted below comprise :—

A—Act of July 15th, 1913.

B—Regulations.

C—Decree of April 8th, 1916.

D—Decree of March 29th, 1917.

THE ACT OF JULY 15TH, 1913.

A 1. On the expiration of a period of three months from the approval of the Regulations for the execution of the present law, no Portuguese steam vessel, with accommodation for more than fifty passengers (including crew), shall be permitted to sail from any port without having installed a wireless telegraph apparatus of the system which suits it best, in good working order, and capable of despatching and receiving radiotelegrams within a radius of action which must never be less than 100 miles.

(a) From this provision those steamers are excepted which navigate only between ports situated at distances of less than 200 miles.

(b) For steam vessels, which navigate in the Colonies where there are coastal radiotelegraph stations, and which only occasionally come to the Metropolis, the period granted for the installation of wireless telegraphy, to which the present article refers, shall be six months.

2. The wireless telegraph material of a vessel, and the respective service of transmission and reception of radiotelegrams, shall be under the charge of one or more duly qualified telegraphists.

§ The number of telegraphists, their qualifications, and that of the indispensable auxiliary staff, the organisation of their technical instruction, provisions with respect to the service of supervision, conditions of the installation of the apparatus, and the official verification of their working, shall be

determined pursuant to the Regulation drawn up for the execution of the present law.

3. It is the province of the captain of the vessel to give instructions and orders for the complete carrying out of the laws and regulations in force with respect to the radiotelegraphic service, and he shall exercise the necessary supervision, carrying out and causing to be carried out any provisions which he may consider advantageous for the good working of the said service.

4. The captain shall be held responsible for any negligence in complying with the requirements of Article 1, and on conviction he shall be liable to a fine not exceeding Rs.200 and the suspension of his master's certificate for one year.

5. Negligence or failure on the part of the captain to carry out the provisions of Article 3 shall render him liable to a fine not exceeding Rs.50, which may be accompanied with imprisonment not exceeding one month after the first offence.

6. If there should be a disaster, stranding or loss of the vessel, resulting from the lack of vigilance of the telegraph staff, and the said fault was due to the negligence of the captain in failing to carry out and causing to be carried out the provisions in force relating to the radiotelegraph service, the captain shall be liable to a fine not exceeding Rs.200, accompanied or not, according to the gravity of the offence with suspension of his certificate for a period of from one to five years.

If the serious injury, or the death, of one or more persons should result from the disaster, the penalties applicable shall be respectively those laid down in Articles 368 and 369 of the Penal Code.

7. The offences referred to in Articles 4, 5 and 6 constitute maritime crimes, and shall be judged by the Commercial Maritime Tribunal pursuant to the disciplinary Code of the Mercantile Marine.

8. All the wireless apparatus intended for Portuguese vessels shall be exempt from Customs and Municipal Duty.

9. Any legislation contrary hereto is hereby repealed.

REGULATIONS.

B The following regulations were issued on August 29th, 1913:—

1. Ships may be equipped with any wireless telegraph apparatus which is in keeping with scientific progress.

2. The shipping or any other company may establish and work a wireless telegraph station on board ship. The station must possess a license granted by the Government of the nationality to which the ship belongs. The "class" of the station is mentioned in the license.

3. There are three classes:—

(a) Long voyage passenger steamers with accommodation for more than 150 passengers must maintain continuous service.

(b) The same type of steamer with accommodation for less than 150 passengers must maintain continuous receiving service, whereas the transmission may be limited.

(c) Cargo or fishing boats, or vessels carrying more than 50 persons (including crew), may have limited service.

4. and 5. Wavelength of 300 m., 600 m. and more than 1,800 m. may be employed. Small boats may work on a 300 m. wave when sending, but 600 when receiving. The waves must be as pure and as undamped as possible.

The oscillator must not be directly connected to the antennae, except in case of distress, or on certain small steamers where the energy employed in the primary does not exceed 50 watts.

6. The cabin must be divided into two parts so that the transmitting gear and the spark gap may be separated from the receiving apparatus. Double walls must be used to isolate the interior from the exterior.

7. The instruments must be able to receive and send 100 letters per minute.

8. New installations employing a power of more than 50 watts must possess such arrangements as will enable them to have a range inferior to their normal, the smallest being approximately 15 miles. All old stations must be brought to this standard as soon as possible.

9. The receiving instruments must be able to tune for waves up to 600 m., being highly protected against perturbations.

10. The power measured at the terminals of the generator must not exceed 1 kw. in normal circumstances. An increase is allowed when a station desires to communicate with a land station other than the nearest, at a distance of more than 200 miles from the nearest land station, and when, in exceptional circumstances, the communication cannot be effected with 1 kw.

11. First and second-class steamers must carry an emergency set in as safe a place as is possible. The emergency set must be able to

work for six hours at least at a distance of 80 miles for first class, and 50 miles for second-class steamers.

12. The apparatus must be operated by a telegraphist who possesses a certificate from the Portuguese Government, or, in urgent cases and for one trip only, from any other Government which has signed the International Convention:

13. There are two certificates:—

(a) 1st Class (same as International).

(b) 2nd Class (12 words, adjustment of apparatus, knowledge of each instrument and its work, and rules *re* handling of telegrams).

Service.—Any member of the crew able to assist the telegraphist in his work, and possessing a knowledge of the operation of the apparatus, may be an "auxiliary" operator.

14. Second-class telegraphists may be employed on board where the wireless service is only for the shipping company's requirements or on fishing vessels, or they may act as assistants in cases where there is already one first-class operator. On first-class steamers two first-class telegraphists must be employed.

15. On second-class steamers, one first-class and one second-class telegraphist should be employed; on third-class vessels one second-class telegraphist will suffice.

Service.—As long as land stations do not exist in the Portuguese Colonies, Portuguese steamers plying there are allowed to carry one first-class telegraphist and one "auxiliary."

16. Transmitting must be performed by a first or a second-class telegraphist, except in urgent cases.

17. The certificates state that the telegraphist has taken an oath of secrecy with regard to the correspondence.

18. The captain has authority over the working of the station.

19. Portuguese operators are preferred.

20. Should none be obtainable, foreigners may be employed if they are in possession of the Portuguese Government's certificate.

In urgent cases where no certificated telegraphist is available, provisional certificates may be issued for one voyage.

21. Certificates are supplied by the Commission after the examination of the telegraphist.

22 and 23. Captains are also bound by an oath of secrecy.

24. All telegrams sent and received on board must be registered by the captain on forms supplied by the Government. The date and hour of the sending or reception of these telegrams must be indicated.

25. Only the telegraphists and the captain are allowed to enter the wireless cabin.

26. The wireless room and the bridge must be connected by either a speaking tube or a telephone, unless they are within easy distance of one another.

DECREE OF APRIL 8TH, 1916.

C This decree forbids the installation of either wireless transmitting or receiving stations, but Government can authorise the setting up of receiving stations only.

These said stations, when authorised by Government, are subject to its control, and whenever Government may judge convenient, it may withdraw the same authorisation without any indemnification.

The owners of these stations have to pay in advance the tax of Escudos \$5.50 per annum.

Anyone who sells wireless material is obliged to send to the Government a statement of the material sold, with the names of the persons who have purchased it to identify them. Those who do not fulfil this identification will pay the fine of Escudos \$20.00 to \$100.00, and all the material that he has for sale will be seized by the Government, and will belong to the Government. In case of a second offence he will be prosecuted.

The owner of any receiving station, or any person who may have made use of the same station, and who divulges contents of messages that have been received by such station incurs a penalty.

In case of a second offence he is subject to imprisonment for six months to a year, and a fine.

DECREE OF MARCH 29TH, 1917.

D In consideration of the highest interest of the State, it is undesirable in the existing circumstances that private persons should possess wireless apparatus of any kind, or make use of the same apparatus.

It has been decided that it is desirable to confine the employment of such apparatus to schools of observatories, so as to limit the risk of misuse; and availing ourselves of the authorisation granted by the Executive Power by the Laws Nos. 373 and 491 of September 2nd, 1915, and March 12th, 1916,

We decree by the proposal of the Minister of Works and Social Providence, the following:—

ART. 1.—It is expressly forbidden to private persons to possess or make use of wireless apparatus and fittings, or to import or sell to the public the said apparatus and accessories.

ART. 2.—The owners—whatever they may claim to be its purpose—of apparatus and wireless accessories without conducting wires, will have to deliver the said articles for deposit against receipt; in Lisbon, at the warehouses of the Material of the Posts and Telegraphs; in Oporto, at the Secretary's Office of the Second Electric Circumspection; and in the

other capitals of the administrative districts of the continent and adjacent islands, at the Secretary's Offices of the Electric Sections and Sub-sections, or of the Post and Telegraph Service.

The deliveries in deposit to which this article refers will have to be effected for the Continent of the Republic, in the maximum period of five days from the date when this Decree is published in the "Diário do Governos"; for the adjacent islands in the same period reckoned from the date when the same daily paper reaches there.

ART. 3.—The apparatus and wireless fittings without conducting wire that are in the Government Teaching Institutions, and at the Astronomical and Meteorological Observatories, in the first case for the purpose of demonstration, and in the second case for scientific tests, are to be under the safe keeping of the directors of the same institutions and observatories, and will be used only for those purposes and in the presence of the said directors and under their entire responsibility, in the presence of the respective teachers and observers.

ART. 4.—He who transgresses the stipulations of this Decree incurs a penalty of Escudos \$20.00 to \$100.00, which will be fixed and collected by the Administration of Posts and Telegraphs; when it is paid voluntarily, the same Administration will order all the material to be seized, which will then belong to the Government.

In case of a second offence the fine will be fixed at its maximum.

If the fine is not paid voluntarily, the transgressors will be handed over to the judiciary, in order to be judged and the penalty imposed by the correctional police.

In Lisbon and Oporto the jurisdiction will concern the tribunal of transgressions.

ART. 5.—This Decree will come into force immediately, and will be valid to the end of the European War, after which the apparatus and wireless fittings which were voluntarily delivered will be returned to their owners, against receipt as to the conditions of Article 2.

ART. 6.—All legislation to the contrary is hereby revoked.

PORTUGUESE EAST AFRICA

(See under MOZAMBIQUE.)

PORTUGUESE GUINEA.

(See also Map Section)

THIS Portuguese Colony, situated on the West Coast of Africa, is bounded by the limits fixed by the Convention with France held on May 12th, 1886, and is entirely enclosed on the land side by French possessions. The estimated population is 289,000 and the area 13,940.

ORGANISATION.

The wireless telegraph installation has not yet been completed but all the apparatus has been received and there are three stations in the course of erection.

ADMINISTRATION.

Up to the time of going to press we have been unable to obtain any further information relating to wireless in Portuguese Guinea. A reference, however, is to be found under Portugal.

RHODESIA

(See also Map Section)

Including : Northern Rhodesia.

RHODESIA comprises the whole region extending from the Transvaal Province northwards to the borders of the Congo State and Tanganyika Territory. It is under the administration of the British South Africa Company, and is divided up into Northern Rhodesia and Southern Rhodesia for administrative purposes. The combined area is 440,000 square miles, with a population of 1,035,000.

CONTROL AND ORGANISATION.

Wireless telegraphy is under the control of the Department of the Administrator and the principal assistants of the Postmaster-General. There are at present no official wireless stations in operation, but authority has been given for the erection of a small wireless telegraph installation at Bulawayo for experimental and instructional purposes. Several applications have recently been made for private wireless stations, and legislation is pending regarding the granting of such licenses. The wireless sets installed in connection with the Cape to Cairo air flight are to be maintained.

ADMINISTRATION.

Southern Rhodesia regulates radiotelegraphy within its border by the "Electric Telegraph Amendment Ordinance" of 1904, and sundry Notices of 1912, the text of which will be found below.

It is possible that legislation and regulations will become necessary in connection with aerial navigation which is now in course of development, and efforts are being made to secure, as far as possible, uniformity with the proposed laws and regulations of the Union of South Africa on this subject.

It is proposed to repeal Section C of Government Notice No. 391 of 1912, to introduce new legislation as printed below—

No permanent arrangements have yet been made for the transmission of time and weather and meteorological signals.

A—Electric Telegraph Amendment Ordinance, 1904.

B—Postal Notice No. 55 of 1912.

C—Government Notice No. 391 of 1912.

D—Amendment to Ordinance of 1906 regarding the issue of licenses.

TELEGRAPH (AMENDMENT) ORDINANCE.

A The term "electric telegraph" whenever used in the "Electric Telegraph Act, 1861," or any law amending the same or relating to "electric telegraphs," shall be interpreted as including any system or means of conveying signs, signals, or communications by electricity, magnetism, electro-magnetism, or other like agency, and whether with or without the aid of wires, and including the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of such system; and the term "line of electric telegraph" shall be interpreted as including any apparatus, instrument, mast, standard, wire, substance, matter, or thing whatever, which is, or may be, used for the purpose of sending, transmitting, conveying, or receiving such signs, signals, or communications.

2. The meaning of the term "person" shall be further extended so as to include individuals, partnerships, companies, and corporations.

3. The provision of the first section of the said Act as to its application to Southern Rhodesia shall be read and construed as including the territorial waters thereof.

4. Within Southern Rhodesia, or the territorial waters thereof, no person not thereto expressly authorised by some law shall erect or make use of any mast, standard, or apparatus of any kind, for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism, or other like agency, or shall erect or construct any line of electric telegraph, except under a license to be granted by the Administrator.

5. The Administrator may authorise the issue of a license for the establishment or use of any apparatus or installation for the transmission of signs, signals, or communications, by electric telegraph, with or without the aid of wires, and may revoke the same at any time, and there shall be payable annually in respect of such a licence such sum not exceeding One Hundred Pounds sterling, as may be fixed by regulation.

6. The terms and conditions of such license, and the duration thereof, shall be subject to such regulations as may from time to time be made by the Administrator.

7. Any person who shall establish or use, or attempt to establish or use, any such apparatus or installation as is mentioned in Sections

1 and 4 of this Ordinance, in contravention of the provisions thereof, or of any other law relating to electric telegraphs, or of any regulation thereunder, shall be liable upon conviction to forfeit all apparatus so used, and to a penalty not exceeding Two Hundred and Fifty Pounds, and, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, and, in case of a second or subsequent conviction, in addition to such forfeiture to a penalty not exceeding Five Hundred Pounds, or in default of payment to imprisonment, with or without hard labour, for a period not exceeding six months.

8. Any Magistrate or Justice of the Peace before whom information shall be given on oath by credible persons, that the provisions of this Ordinance are being, or have been, or are likely to be infringed, may issue a search warrant, and authorise the seizure of any instruments, apparatus or appurtenances reasonably suspected to be intended for use in such contravention.

9. Notwithstanding the provisions of Section 4 of "The Electric Telegraph Act, 1861," all regulations made under the authority of that Act shall be published in the *Gazette*, and be subject, *mutatis mutandis*, to the provisions of Section 7 of Act No. 5 of 1883 of the Cape of Good Hope.

10. This Ordinance may be cited as the "Electric Telegraph Amendment Ordinance, 1904," and shall be read as one with "The Electric Telegraph Act, 1861," of the Cape of Good Hope, and the "Telegraph Protection Ordinance, 1901," and the said laws may be cited together as the "Electric Telegraph Laws, 1861 to 1904."

POSTAL NOTICE No. 55 OF 1912.

B Public attention is hereby directed to the provisions of the "Electric Telegraph Amendment Ordinance, 1904," under which no person not thereto expressly authorised by some law shall erect or make use of any mast, standard or apparatus of any kind for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism or other like agency, or shall construct any line of electric telegraph except under a licence to be granted by the Administrator.

The term "Line of Electric Telegraph" is defined as any apparatus, instrument, mast, standard, wire, substance, matter or thing whatever which is or may be used for the purpose of sending, transmitting, conveying or receiving signs, signals, or communications.

All persons having, or desiring to have, such lines of electric communication, including telephone lines, whether on their private property or otherwise, are hereby notified that application for license to use such lines must be made to the Administrator through the Postmaster-General.

The license fees payable in respect of such lines, as published in Government Notice No. 391 of 1912 are as follow:—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The license does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

(c) £50 per annum for any installation of wireless telegraphy or telephony.

All persons having in use lines of electric communication which have not been authorised by the Administrator are hereby notified that unless the required permission be applied for within one month of the date of publication of this Notice they will render themselves liable to the penalties provided in Section 7 of the Telegraph Ordinance above referred to.

GOVERNMENT NOTICE.

No. 391 of 1912.

DEPARTMENT OF POSTS AND TELEGRAPHS.

The Treasury, Salisbury,

December 19th, 1912.

C It is hereby notified for public information that His Honour the Acting Administrator, with the advice of the Executive Council, has been pleased to approve of the following Regulations regarding the issue of licenses for installations of private telephones, telegraphs, or other means of electric communication, whether with or without wires, in terms of section 5 of the "Electric Telegraph Amendment Ordinance, 1904."

By command of His Honour the Acting Administrator in Council.

P. D. L. FLYNN, Acting Treasurer.

When any person is authorised to establish or use any means of electric communication as defined in the "Electric Telegraph Amendment Ordinance, 1904," the Postmaster-General may issue to such person an annual license for the use of such line on payment in advance of the undermentioned fees, namely:—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The license does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

No.

June, 1922.

D It is hereby notified that under the powers conveyed by Section 6 of the "Electric Telegraph Amendment Ordinance, 1904," the following regulations in regard to the issue of licenses for the establishment and operation of private wireless telegraph or telephone installations shall have effect from the date of this notice.

1. Section C of Government Notice No. 391 of 1912 is hereby cancelled.

2. No license shall be issued except under the authority of the Administrator and on payment of such annual fee as may be specified therein, not exceeding one hundred pounds sterling.

3. Applications for licenses must be addressed to the Postmaster-General, and must contain the following information:—

(a) The full name and occupation of the occupant;

(b) The address at which the apparatus is proposed to be installed;

(c) A full description of the apparatus, with such diagrams as may be required;

(d) The purpose for which the apparatus is proposed to be used; and

(e) Generally such other information as may be required by the Postmaster-General.

4. An applicant may further be required:—
 (a) To produce evidence of British birth or nationality;
 (b) To furnish two approved written references as to character;
 (c) To satisfy the Postmaster-General by examination or otherwise that he has attained a knowledge of the regulations of the International Radiotelegraphic Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators, and that he can read by sound Morse signals at the rate of 12 words per minute; and
 (d) To satisfy the Postmaster-General that he has in view some definite object of scientific value or general public utility.
5. Each license issued under these regulations shall contain a schedule setting forth:—
 (a) The maximum power which may be used;
 (b) The maximum wavelength;
 (c) The maximum dimensions of the aerial;
 (d) The stations, if any, with which communication may be established; and
 (e) Such other details as may be required.
- And the licensee shall not at any time exceed or vary the limits or conditions therein laid down except with the consent in writing of the Postmaster-General.
6. The granting of any license under these regulations shall not in any way vary or detract from the rights, powers or privileges of the

Postmaster-General as defined by law or regulation, nor shall it involve any obligation or responsibility on the Postmaster-General for any matter or thing which may be done by the licensee or his agents.

7. All apparatus and plant installed under license shall be subject to the approval of the Postmaster-General, and to inspection by any of his officers duly authorised thereto from time to time.

8. The licensee shall comply with all directions which shall be given to him by the Postmaster-General, and shall at any time cease to work, or shall completely dismantle the licensed apparatus and plant upon notice to do so in writing from the Postmaster-General.

9. The licensee shall not divulge to any unauthorised person, or make any use whatever of any message coming to his knowledge by means of his apparatus and not intended for his use.

10. The licensee shall account to the Postmaster-General for any rates or fees that may be chargeable on any message passing through his apparatus.

11. Except with the consent in writing of the Postmaster-General the licensee shall not permit the use of his apparatus by any other person nor shall he assign or dispose of any rights, powers or privileges granted to him by license.

12. The Postmaster-General may at any time give notice in writing to determine any license granted under these regulations.

RUMANIA

(See also Map Section)

THE country was formed by the fusion of the two Principalities of Moldavia and Wallachia on December 23rd, 1861, and its first ruler was Colonel Cuza, who had, in 1859, been elected "Hospodar" or "Lord" of the two Principalities, assuming the Government under the title of Prince Alexandru Joan I. The present ruler is Ferdinand I. The total population is 8,762,092 and the area of the Kingdom 122,282 square miles.

CONTROL.

All wireless telegraphic or telephonic services and stations are owned and operated by the State under the Direction Special of Radio Communications which forms part of the Ministry of Communications.

Authority to possess installations is given to scientific institutions, and also to those engaging in special wireless research work.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. Emile Gurgea, Dr. Sc.	Director of Radio Communications. . . .	Str. Renasterei, Nr. 6, Bucharest
Geles Emile	Technical Inspecting Engineer	Bucharest
M. Cottesco Cottesco	Wireless Engineer in the Wireless Service, Technical Director	Bucharest
M. B. Nicolesco-Dorobantu	Engineer in the Wireless Service	Bucharest
M. Dumitrescu Aurel	Technical Engineer.	Bucharest

The following is the position regarding the wireless stations in Rumania:—

International Service Stations	....	....	....	3
Interior Service Stations	....	....	....	3
Military and Fluvial	....	....	....	4
Under construction	....	....	....	27

ORGANISATION.

In 1915 Bucharest was cut off from telegraphic communication with the West, and an improvised wireless station of 8-10 kW. (50 cycles) was constructed from laboratory apparatus. A second station with an alternator (100 cycles) was also constructed in the Carol Park, Bucharest, by means of which communication was established with Athens, Rome and Paris. Several months later the Ministry of War constructed a new station of about 20 kW. (100 cycles), which only worked over small distances because shortly afterwards a 150 kW. station, system S.F.R. spark 1,000 cycles, with a horizontal antenna supported by eight towers 325 ft. high was erected at Herastreu (Bucharest). At the same station there existed an S.F.R. installation of 15 kW. These two S.F.R. stations afforded excellent wireless communication until the evacuation of Bucharest in November, 1916, when the 15 kW. station was installed at Vaslui (Moldavia), where it is still located—and established communication with Salonica and the 150 kW. station at Botosani (North Moldavia), where it worked until the evacuation of the latter town (June, 1917). The principal station at Herastreu (Bucharest), which was destroyed during enemy occupation, is being rebuilt. The eight metal towers, which were carried off by the Armies of Occupation, are being replaced by eight others about 365 ft. high, of which seven are ready. Whilst awaiting the proximate reinstallation of the 150 kW. station, a new 15 kW. station has been constructed on the spark system (600 cycles). The installation will soon be completed by a 50 kW. arc set, and will be fitted for automatic transmission and reception.

The whole system of radio communication is at present undergoing complete reorganisation, and it is hoped that by the beginning of this summer will be established and working.

A comprehensive system of public correspondence, meteorological, press and time signals is being drawn up and will be put into operation as soon as the new stations under construction are completed.

ADMINISTRATION.

Rumania took part in the various International Radiotelegraphic Conferences.

An entirely new set of Laws and Regulations concerning radiotelegraphy and radiotelephony are being drawn up and will shortly be passed, but up to the time of going to press no information is to hand regarding them.

RUSSIA

(See also Map Section)

Including : Bokhara, Khiva Armenia, Azerbayan, Ukraïne.

UNTIL March, 1917, this vast area was administered by the late ex-Czar Nicholas II, who was descended, in the female line, from Michael Romanoff, elected Czar in 1613 after the extinction of the House of Rurik. At the date above referred to, the Russian Duma carried through a *coup d'état*, as a result of which Czar Nicholas abdicated.

The approximate area is 8,166,130 square miles, and had originally a population of 131,546,045.

ADMINISTRATION.

Wireless telegraphy is extensively used throughout these wide territories; but we are not at present in a position to give any information regarding Laws and Regulations. Reference to the 1921 edition of the Year-Book will give such Statutes and Regulations as were in existence prior to the *coup de état* mentioned above.

SAINT HELENA

(See also Map Section)

Including : Tristan da Cunha.

THE lonely little island of St. Helena, with an area 47 square miles, in the South Atlantic, lies about 800 miles from the nearest land (Ascension Island) and 1,200 miles from the West Coast of Africa. Its claim to fame rests upon the fact that it formed the place of exile of the great Napoleon.

St. Helena is an Admiralty coaling station and a resting place for the Eastern Telegraph Company's cable between Cape Town and St. Vincent (Cape de Verdes). Its area is 47 square miles with a population of 3,747.

Tristan da Cunha is a small group of islands in the Atlantic half way between the Cape of Good Hope and South America. At present there is no wireless communication, but efforts are being made to erect a set suitable for communication with the outer world.

ADMINISTRATION.

Wireless Telegraphy is administered under the following Ordinance and Regulations:—

A—Wireless Telegraphy Ordinance, No. 2 of 1913.

B—Regulations.

IN THE FOURTH YEAR OF THE REIGN OF HIS MAJESTY KING GEORGE V.

MAJOR HARRY EDWARD SPILLER CORDEAUX,
Companion of the Most Honourable Order
of the Bath; Companion of the Most
Distinguished Order of Saint Michael and
Saint George; Governor and Commander-
in-Chief. 14th July, 1913.

A An Ordinance to provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of
St. Helena as follows:—

I. This Ordinance may be cited as the
"Wireless Telegraphy Ordinance, 1913."

II. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

III. A person shall not establish any wireless telegraphy station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

2. Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

IV. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

V. The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

2. The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

3. If at any time, in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

VI. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a license in that behalf, or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

VII. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding £50, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

2. Proceedings shall be taken before the police magistrate on the complaint of the chief of police or of any other person thereto authorised by him in writing, and the procedure

shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

VIII. "The Wireless Telegraphy Ordinance, 1912," is hereby repealed.

GOD SAVE THE KING !

Given under the Public Seal of the Island of St. Helena this 14th day of July, 1913.

By command of His Excellency the Governor,
(Signed) A. HANDS,
Chief Clerk.

REGULATIONS.

Made by the Governor in Council under Ordinance No. 2 of 1913, entitled "An Ordinance to provide for the Regulation of Wireless Telegraphy."

B

I. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

II. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships

of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

III. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

IV. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

V. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

VI. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor in Council this 14th day of July, 1913.

(Signed) A. HANDS,
Chief Clerk.

SAINT LUCIA

(See under BRITISH WEST INDIES.)

ST. PIERRE AND MIQUELON

(See also Map Section,

SITUATED close to the south coast of Newfoundland, these two groups of islands form a French Colony under an Administrator. They have an area of 93 square miles, and support a population of 3,918.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in this colony. A reference, however, is to be found under France and Algeria.

SALVADOR

(See also Map Section)

THE independent Republic of El Salvador is situated on the West Coast of Central America, and occupies an area estimated at 13,183 square miles. The population, according to the Census of 1919, numbers 1,501,000. It originated in the course of the dissolution of the Central American Federation (Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica) which took place in 1839.

The form of Government is Republican, democratic and representative, with three branches of Administration: (1) The Executive, which comprises the President and Cabinet Ministers; (2) the Legislature or National Assembly; and (3) the Judiciary.

CONTROL AND ORGANISATION.

The only wireless station was erected by the Government and inaugurated in September, 1917. It is situated at the southern end of the city of San Salvador, near the military post "El Zapote." The station was presented to this Government by the Government of Mexico, and is known by the name of "Estación Venustiano Carranza." It is open to public correspondence with ships.

Radiotelegraphy is a State monopoly and is under the control of the Telegraph and Telephone Administration, which forms one of the departments of the "Ministerio de Gobernacion y Fomento." Private companies or individuals are permitted under license from the Government to erect and work wireless telegraph and telephone stations provided the present contract with the Cable Company is not infringed.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Señor Dr. don Arturo Argüello		
Loucel	Minister of Public Works	San Salvador
Señor Don Ricardo Posada ..	Director of Telegraphs	San Salvador

ADMINISTRATION.

At present there are no special laws regulating wireless telegraphy, and the only publication which deals with this subject is the *Revista Telegrafica*, the official organ issued by the Director-General of Posts and Telegraphs, wherein are reported any such notices and items.

SAMOA ISLANDS

(See also Map Section)

THE Dutch were the original owners of these islands in 1722, but in 1872 the Harbour of Pagopago, in Tutuila, was ceded to the United States for a naval and coaling station. After various changes of ownership the islands (east of 171° West of Greenwich) were finally ceded to the United States in 1900, Germany retaining the remainder of the group.

The area of the American possession is 102 square miles with a population of 8,324.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Samoa. A reference, however, is to be found under the United States of America.

SAN MARINO

(See also Map Section)

THE independent Republic of San Marino is embraced in the area of Italy. It claims to be the oldest state in Europe. The area of this Republic is 38 square miles with a population of 12,027.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in San Marino. Reference, however, may be made under Italy.

SARAWAK

(See under BRITISH NORTH BORNEO.)

SERB, CROAT AND SLOVENE STATE

(See also Map Section)

THIS country was formed by the fusion, under the terms of the European Peace Treaty, of Servia, Montenegro, and the provinces of Bosnia and Herzegovina, which were annexed by Austria in 1908. Alexander I is the reigning king. The estimated area is 95,628, with a population of 11,337,686.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in this State.

SEYCHELLES ISLANDS

(See also Map Section)

THIS Colony consists of a group of islands belonging to Great Britain, almost in the middle of the Indian Ocean, and 600 miles north-east of Madagascar. Formally associated with Mauritius, the Colony of Seychelles was at one time administered from that island; but in 1888 a special Administrator was created, and the occupant of the post in 1903 was raised to the rank of Governor.

The principal island is Mahé (52½ square miles), and the Colony includes a number of dependent islands, having a total area of 156 square miles, and a population of 24,811.

CONTROL AND ORGANISATION.

There are no private or commercial wireless installations. The only installation in the Colony was erected in 1915 at North-West Bay, Mahé, and belongs to the Admiralty.

This station was closed for communication purposes on July 15th, 1921, and a "Care and Maintenance Party" was left to keep the plant in running order. This party was withdrawn in March, 1922.

There is no official of the Seychelles Government Service who is specially charged with the supervision of radiotelegraphy. Its control forms part of the general administration, of which the principal personnel will be found below.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Brig.-Gen. Sir Joseph Byrne, K.B.E.,-C.B.	Governor and Commander-in-Chief	Mahé
His Honour P. B. Petrides	Chief Justice	Mahé
Hon. J. L. Devaux	Legal Adviser and Crown Prosecutor	Mahé
Hon. E. Taylor	Treasurer and Collector of Customs	Mahé
Dr. J. B. Addison, O.B.E.	Chief Medical Officer	Mahé
Mr. G. S. Follows	Private Secretary	Mahé

ADMINISTRATION.

Radiotelegraphy is administered under the Ordinances, the text of which will be found below, and which cancel "The Telegraphic and Electrical Stations Ordinance, 1903," printed in our former issues.

The list of current rules here included is as follows;—

A—Ordinance No. 3 of 1914.

B—Ordinance No. 11 of 1917.

C—Regulations (No. 127) thereunder.

ORDINANCE No. 3 OF 1914.
Dated February 19th, 1914.

Enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof.

A To provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof, as follows:—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1914."

2. In this Ordinance and in any regulation made thereunder the expression "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor in Executive Council may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding two thousand rupees (Rs. 2,000) or to imprisonment for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance without the previous sanction of the Crown Prosecutor.

(2) If the Chief Justice or the Police Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor in Executive Council may make regulations for all or any of the following matters:—

(i) for prescribing the form and manner in which applications for license under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any license;

(iii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof and so as to not interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting except with the special or general permission of the Postmaster of the Colony the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the Colony;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships whether British or foreign in the waters of the Colony the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraph (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper but shall not be subject to any rent or royalty.

8. Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of one thousand Rupees (Rs. 1,000).

9. Ordinance No. 4 of 1903 is hereby repealed.

ORDINANCE No. 11 OF 1917.

AN ORDINANCE TO AMEND ORDINANCE No. 3 OF 1914.

Dated September 1st, 1917.

B Be it enacted by the Governor of the Colony of Seychelles by and with the advice and consent of the Legislative Council thereof, as follows:—

1. This Ordinance may be cited as "The Wireless Telegraph (Amendment) Ordinance, 1917," and shall be construed as one with the Wireless Telegraph Ordinance, 1914.

2. Section 6 (iv) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed and replaced by the following:—

(iv) For prohibiting except with the general or special permission of the Governor, the working or using of any apparatus for wireless telegraphy on board any ship whether British or foreign other than His Majesty's ships of war, whilst such ship is in the waters of this Colony and for the control or disposal of any apparatus, instrument or thing which may be used in connection with wireless telegraphy on board any ship (other than His Majesty's ships of war) whilst such ship is in the waters of the Colony.

3. Section 6 (2) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed.

4. (1) The Governor may appoint officers for the purpose of seeing that the provisions of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder are complied with and it shall be lawful for such officers to go on board any ship whether British or foreign whilst any such ship is at anchor in the waters of the Colony to see that such provisions are complied with.

(2) If any such officer is molested, obstructed, hindered or insulted while in the execution of his duties an offence shall be deemed to have been committed.

5. For the purpose of any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, or under any regulations made thereunder, the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship and for any breach of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder.

6. Any summons or other document in any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been

committed with the person being or appearing to be in command or charge of the ship.

7. The regulations published in *Gazette* No. 22 of 1914 under Government Notification No. 52 of 1914 are hereby repealed.

Passed in the Legislative Council at a meeting held on the 27th August, 1917.

REGULATIONS.

No. 127 of 1917.

C 1. The radiotelegraph stations on board ships (other than His Majesty's ships of war) shall not be worked whilst such ships are within any harbour or bay of the Colony.

2. For the proper enforcement of section 1 of these regulations ships of British register in any harbour or bay of the Colony must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

3. (1) Ships of foreign register in any harbour or bay of this Colony must, subject to the provisions of sub-section 2 of this section, take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(2) Ships of foreign register remaining in a harbour or bay of this Colony for less than twelve hours may, at the discretion of the Governor, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of section 2 of these regulations.

4. Any officer appointed under the provisions of section 4 of Ordinance No. 11 of 1917 may order that the radiotelegraph cabin on board any ship (other than His Majesty's ships of war) be sealed and he shall thereupon affix his seal to such cabin.

If any seal so affixed is removed or tampered with an offence shall be deemed to have been committed against these regulations.

Made by His Excellency the Governor in Executive Council at a meeting held on the 24th day of September, 1917.

SIAM.

(See also Map Section)

THE Kingdom known to us as Siam, to the natives as Muang Thai, lies between British Burma and French Indo-China. Its integrity is guaranteed by France and Great Britain under mutual agreement. The form of government is an absolute monarchy, with an Executive Council of ministers. The reigning king is Chao Fa Maha Vajiravudh.

The total area of Siam (inclusive of all the islands) measures about 198,900 English square miles, with a population of 8,266,908. The coast line extends approximately over 2,000 miles, and geographically Siam lies between 5° 40' and 20° 20' N. latitude, and between 97° 5' and 105° 0' E. longitude. The greatest distance east to west is estimated at about 510 miles, and that from north to south 1,005 miles.

CONTROL.

Radiotelegraphy is organised in Siam under supervision of the Minister of Marine, but it is now controlled by the Ministry of Communications in so far as the public is concerned. The first stations erected were those at Saladeng in Bangkok (lat. 13° 44' 32.49" N., long. 100° 29' 22.30" E.), and at *Songkhla (lat. 7° 10' 0" N., long. 100° 36' 12" E.); both these land stations are directly controlled by Government.

* Sometimes spelt "Singora."

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eng. Capt. Phravidyu Duralikhit ..	Head and Chief Engineer of Radiotelegraphic Department	Wireless Station, Bangkok
Eng. Lieut.-Commander Luang Jamnarn Aggikich	Assistant Engineer	Wireless Station, Bangkok
Sub. Lieut. Kanchana Yosadhara	Station Master	Bangkok
Eng. Junior Lieut. Chvam Kalantanandha	Operating Instructor	Bangkok
Sub. Lieut. Cherm Chatiketa	Principal Assistant	Bangkok
Lieut. Hatha Yuvanakara	Station Master	Songkhla
Sub. Lieut. Prasidhi Yangprida	Principal Assistant	Songkhla
Junior Lieut. Man Promphisuthi	Station Engineer	Songkhla

ORGANISATION.

There are experimental, amateur, and instructional stations at Saladeng. There are also ship stations on Government vessels.

ADMINISTRATION.

The law and regulations under which radiotelegraphy is administered in Siam will be found below.

A—Radiotelegraph Act, B. E. 2457 (1914).

B—Notice concerning the opening of Radiotelegraphy for Public Service, B. E. 2462 (1919).

C—Ministerial Regulations relating to the use of Radiotelegraphy, B. E. 2462 (1919).

D—Radiotelegraph Amendment Act August 4th, 1921.

RADIOTELEGRAPH LAW.

A This Law may be cited as "The Radiotelegraph Law, B.E. 2457" (1914).

2. It shall come into force from the date of its publication in the Government Gazette.

COAST AND LAND STATIONS.

3. The right to establish and work radio-stations for telegraphic and telephonic purposes on Siamese soil and on board ships permanently anchored in Siamese territorial waters is an exclusive privilege of the Government.

This privilege shall be reserved to the Department of Posts and Telegraphs in the Ministry of Communications.

4. The Army and Navy may establish and work independently radiotelegraph stations or field apparatus subject to such conditions as may be from time to time sanctioned in writing by the Minister of War or Marine.

Any station established under this section may be opened to public correspondence only under special arrangement with the Department of Posts and Telegraphs.

SHIP STATIONS.

5. No merchant ship under the Siamese flag shall establish or work any radiotelegraph or telephone apparatus without a license from the Minister of Communications.

The Minister of Communications shall not grant such license until he has been satisfied that the apparatus can work in accordance with the provisions of the International Radiotelegraph Convention of London, 5th July, 1912, and will be handled by qualified operators.

Such license shall be for such time and subject to such conditions as the Minister of Communications may deem good.

6. No ship, whether under the Siamese or a foreign flag, excepting ships of war, is allowed while in Siamese territorial waters to send a

message by means of her radiotelegraph apparatus when and where such message can be forwarded by the Government system, either with or without wires, except for the purpose of transmitting messages to or from a ship in distress.

SECRECY.

7. No person or persons engaged in or having knowledge of the operation of any radio-station shall disclose the contents of any message transmitted or received by such station for the purpose of transmission, except to the person to whom the same may be directed or his authorised agent, or to another station employed to forward such message to its destination, or in obedience to the directions of a Court of competent jurisdiction.

PENALTIES.

8. Whoever establishes or works any apparatus contrary to the provision of Sections 3 and 6, or in excess of the conditions laid down under Section 4 of this Law, shall be punished with imprisonment not exceeding six months or fine not exceeding five hundred ticals or both.

The captain or master of a ship, and the person directly responsible for the offence, if any, shall both be liable to punishment for every infringement of the provisions of Section 6.

9. Any person infringing Section 5 of this law shall be punished with fine not exceeding one hundred ticals.

10. Upon the conviction of any person of an offence under the foregoing sections, the Court may order the forfeiture of any apparatus used for the commission of such offence.

11. Any person injuring apparatus or committing any act of mischief to a radiotelegraph station lawfully established, or doing anything to prevent or intended to prevent the transmission or delivery of any radiotelegraph message by any such station, shall be guilty of an offence under Section 196 of the Penal Code.

12. Whoever commits any offence against Section 7 of this Law shall be punished under Section 279 to 281 of the Penal Code.

EXECUTION.

13. The Minister of Communications shall have charge and control of the execution of this Law.

It shall be lawful for him to frame regulations and to fix the scale of fees for land, coast, and ship charges in the transmission of messages by radiotelegraphy or telephony, as well as for licences under Section 5.

It shall also be lawful for him to frame regulations about the qualifications required from operators.

All such regulations shall be in accordance with the detailed Service Regulations appended to the International Radiotelegraph Convention.

Such regulations, on being sanctioned by His Majesty and published in the Government Gazette, shall be deemed to be part of this Law.

Given on the 24th day of April, B.E., 2457 (1914), being the 1,261st day of the Present Reign.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas His Majesty's Government has always reserved to itself the exclusive right to establish and work means of telegraphic and telephonic communications throughout Siam;

And whereas apparatus for wireless telegraphy has now been devised practicable for use by land and sea;

And whereas it is desirable that ships under the Siamese flag, more specially passenger carriers, should be equipped with such apparatus, worked under proper regulations, for the greater safety of life at sea;

And whereas the regulations necessary to insure the proper and efficient working of wireless telegraphic stations must conform in all respects with the provisions of the International Radiotelegraph Convention of London, 1912, to which His Majesty's Government has been a party;

Therefore His Majesty has been pleased to enact the following law:—

NOTICE CONCERNING THE OPENING OF RADIO-TELEGRAPHY FOR PUBLIC SERVICE.

Dated 22nd May, 1919.

B In view of the progress made in commerce and trade in this country, it is considered that the use of Radiotelegraphy which was originally established by the Royal Government for its own use should be extended to general public.

The Ministry of Communications having submitted these facts before His Majesty the King, has now obtained the Royal Permission that the Naval Radiotelegraphic stations in Bangkok and at Singora (Songkhla) should be open to public use from the 1st June, 1919.

The public radiotelegraphic service will be under the management of the telegraph officials of the Post and Telegraph Department, who will receive and despatch radiotelegraphic telegrams in a similar manner to the despatch of other telegrams in the Kingdom.

Senders of radiotelegraphic messages should write clearly the words "Wireless Telegraph" on the upper left-hand corner of the form supplied, before the names of the persons for whom the messages are destined.

(Sd.) 1st Grand Councillor,

Chaò Phya Wongsa Nuprabadh,
Minister of Communications.

MINISTERIAL REGULATIONS FOR THE LICENSING OF RADIO-TELEGRAPHY UPON SHIPS, THE ISSUING OF CERTIFICATES OF COMPETENCY TO RADIO-TELEGRAPH OPERATORS, THE FIXING OF FEES FOR SUCH LICENSES AND CERTIFICATES AND THE FIXING OF FEES FOR LAND, COAST AND SHIP CHARGES IN THE TRANSMISSION OF MESSAGES BY RADIO-TELEGRAPHY.

C Whereas under Sections 5 and 13 of the Radiotelegraph Law, B. E. 2457, the Minister of Communications is empowered to license the establishment and working of radiotelegraph apparatus upon merchant ships under the Siamese flag, to frame regulations about qualifications required from operators and to fix the scale of fees for land, coast and ship charges in the transmission of messages by radiotelegraphy, such Regulations, on being approved by His Majesty and published in the Government Gazette to be deemed to be part of the Law.

It has now pleased His Majesty the King to authorise the Minister of Communications to issue the following Ministerial Regulations:—

1. The operation of radiotelegraph stations upon any merchant ship under the Siamese flag must conform to the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended to the said International Radiotelegraph Convention, the Radiotelegraph Law, B. E. 2457 and any amendments and alterations which may be made therein, and the regulations from time to time issued by the Minister of Communications under the authority of said Radiotelegraph Law, B. E. 2457.

2. No person shall work the radiotelegraph upon any merchant ship within Siamese territorial waters in such a way as to interrupt or interfere with

(a) Naval or military signalling.

(b) The transmission of messages between other radiotelegraph stations lawfully established.

3. Before the installation of any radiotelegraph apparatus upon any merchant vessel under the Siamese flag, an application shall first be filed with the Minister of Communications, according to Form A of Schedule I, attached hereto. If the Minister of Communications is satisfied that the apparatus described in said application, will, when installed, be capable of working in accordance with the requirements of Section 4 (a) of these Regulations, an installation licence will be issued according to Form B. of said Schedule I. When the installation is completed, the applicant shall notify the Minister of Communications, who, thereupon, will cause an inspection to be made. If this inspection is satisfactory, the Minister of Communications will issue a ship license according to Form C, and subject to the conditions therein contained. Such ship license shall be good until March 31st after its date, but may be renewed within one month immediately after the expiration of the period for which it was issued. Such installation licenses and ship licenses shall be executed in duplicate, one copy to be retained by the Ministry of Communications and the other given to the licensee.

4. The Minister of Communications shall not grant such ship license unless he is satisfied that—

(a) the radiotelegraph apparatus can be worked in accordance with the provisions of the International Radiotelegraph Convention of London and the detailed Service Regulations appended thereto, and that,

SCHEDULE I.

Conditions and Forms of application for License to install Radiotelegraph Apparatus on ships, Installation License, and Ship License.

I.

Application for installation licenses shall be made according to the following form:—

FORM A.

I, of the owner of the ship,
do hereby make application for permission to install upon said ship apparatus for radiotelegraphy according to the following specification:—

SPECIFICATION.

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power		If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Apparatus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments. Current Voltage	
1	2	3	4	5	6	7 8	9

The above described apparatus will be installed in months.

Signed

II.

License for installation of Radiotelegraph Apparatus upon ships shall be according to the following form:—

FORM B.

License for installing Radiotelegraph Apparatus.

Whereas of has filed with the Ministry of Communications his application dated for the installation of radiotelegraph apparatus upon the ship

Now the Minister of Communications does hereby license and permit the installation upon the said ship within the period of months from date of radiotelegraph application in accordance with the following specification:

Name of Ship.	Normal range of Signalling in Nautical Miles.		Character of Apparatus		Power		If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Apparatus	Wave-length in Metres	Source and Maximum Output	Maximum taken by transmitting Instruments. Current Voltage	
1	2	3	4	5	6	7 8	9

This license and permission does not permit the licensee to operate said apparatus above described until after its inspection when installed and the issuance of a ship license.

Signed
Minister of Communications.

(b) operators qualified in accordance with the provisions of these Regulations and who are the holders of the certificates provided for herein will be employed to work the same.

5. A separate license is required for each ship belonging to the same owner.

6. The fee for the issuance of each ship license shall be 5 Bahts and a fee of the same amount shall be charged for each renewal thereof.

7. No person shall work a radiotelegraph on board any merchant ship under the Siamese Flag unless he holds either a first or second-class certificate of competency granted by the Minister of Communications.

8. The Minister of Communications shall grant certificates of competency in accordance

with the conditions contained in the second Schedule to these Regulations.

9. Should a holder of a certificate of competency granted under these rules be proved to the satisfaction of the Minister of Communications wilfully or negligently to have failed to comply with the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457 or the Regulations issued by the Minister of Communications, or any amendments or modifications of any of these or any other Regulations which may be issued from time to time for his guidance, the Minister of Communications may cancel the certificate.

10. The Minister of Communications or any officer authorised by him may require the holder of a certificate of competency to produce the same for cancellation under Regulation 9, and the holder must comply with such requisition.

11. Nothing in these Regulations shall apply to the use of the radiotelegraph for the purpose of making or answering signals of distress.

12. Rates for messages transmitted to or received from ship stations, shall be as follows :—
Coast station transmitting or receiving charge for radiotelegrams to or from ships, 20 satangs (0.40 francs) per word with a minimum charge of 2 Bahts (4.00 francs).

Land charges for the receipt or transmission of radiotelegrams over the Inland Telegraph System shall be those provided in the published tariff for inland messages. Land charges shall in addition include the actual expenses of postage or carriage, if the message is to be delivered outside of established telegraph districts.

Charges for relaying messages outside of Siam shall be fixed in accordance with published international tariffs.

These rates may be modified or supplemented and rates fixed for the charges at ship stations by the Minister of Communications.

III.

The ship license provided for in Regulation 3, shall be in the following form and subject to the following conditions :—

FORM C.

Know all men by these presents that, whereas.....of.....hereafter called the "licensee," is desirous of establishing, maintaining and working on the ship..... belonging to the licensee, radiotelegraphy under Section 5 of the Radiotelegraph Act, B. E. 2457 ;

And whereas the licensee has agreed and by the acceptance of this license, does become bound to operate and maintain the radiotelegraph installation for which this license is granted in accordance with the International Radiotelegraph Convention of London of July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457, and the Regulations thereunder by the Minister of Communications, and any and all amendments and modifications of any of these, which may be made from time to time ;

Now the Minister of Communications hereby grants to the licensee during the term or period commencing with the date hereof and terminating on the 31st day of March, B. E. 24....(19), license and permission ;

(1) To establish, maintain and work for the purpose hereinafter mentioned upon the ship..... but subject in all respects to the provisions of said International Radiotelegraph Convention of London, July 5th, 1912, to the Service Regulations appended thereto, the Radiotelegraph Law of B. E. 2457, and the Regulations issued by the Minister of Communications, and all amendments and modifications of any of these, apparatus for radiotelegraphy known as the.....system of radiotelegraphy.

(2) To transmit and receive messages by means of the licensed apparatus between the said ship and coast stations and other ship stations ;

(3) To receive money or other valuable consideration for or in respect to the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus, according to the schedule of charges fixed in the Regulations or by the Minister of Communications.

And it is hereby declared that the said license and permission is granted upon and subject to the following further conditions and provisions :—

(1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of any messages except those authorised by this license.

(2) (a) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval or Military signalling or with any radiotelegraph station lawfully established..

(b) If at any time it becomes apparent that the working of the licensed apparatus upon said ship is inconsistent with the free use of naval or military signalling the licensee shall when required so to do by the Minister of Communications close said station upon said ship.

(3) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Minister of Communications from time to time for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus, to be distinguished from those emanating from any other radiotelegraph station.

(4) The licensee shall at all times indemnify His Majesty's Government, the Minister of Communications and the Department of Posts and Telegraphs against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any damage arising from any act licensed or permitted by these presents.

(5) Subject to the provisions of this license, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or precedence whether as regards rates of charge, order of transmission or otherwise, except that preference shall be given to messages transmitted on behalf of His Majesty or of His Majesty's Government.

(6) The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus, or any other means in the power of the licensee.

(7) The licensed apparatus shall be worked only by a person holding a certificate of competency issued by the Minister of Communications.

(8) The licensee shall not divulge to any person other than properly authorised officials of His Majesty's Government or make any use whatever of any message coming to the knowledge of the licensee through naval or military signalling.

(9) The licensee shall keep such accounts records and registers of all messages transmitted by means of the licensed apparatus as the Minister of Communications may from time to time require and such accounts, records and registers shall be open to the inspections of the Minister of Communications or his duly authorised representative at all reasonable times.

(10) The Minister of Communications or his duly authorised representative may at all reasonable times enter upon said ship for the purpose of inspecting and may inspect any appa-

ratus fixed or being in such ship for the purpose of sending and receiving messages by radiotelegraphy, and the method of working such apparatus.

(11) The Minister of Communications may at any time by notice in writing but without assigning any reason revoke and determine this license and thereupon this license shall determine and become absolutely void.

(12) Any notice, request or consent (whether required to be in writing or not) to be given by or on behalf of His Majesty's Government or by the Minister of Communications or the Director-General of the Post and Telegraph Department, may be served by sending the same in a letter addressed to the licensee at the office for the time being of the licensee, or by delivery to the master of the ship upon which the licensed apparatus is installed and any notice to be given by the licensee under these presents may be served by sending the same in registered letter addressed to the Minister of Communications.

Signed and delivered by.....

Minister of Communications.

SCHEDULE II.

CONDITIONS AND FORMS FOR THE GRANTING OF CERTIFICATES OF COMPETENCY.

(1) Certificates of competency as to radiotelegraph operators on board merchant ships under the Siamese Flag, shall be granted by the Minister of Communications, subject to an examination and shall be in accordance with Form B, appended hereto. Such certificates shall indicate the system or systems of radiotelegraphy in which the examination was conducted, and shall certify that the holder:

(a) In the case of first-class certificates is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of not less than 20 words per minute (five letters being counted as one word); or

(b) In the case of second-class certificates is able to send and receive by sound, messages in plain language in the International Morse Code at a rate of from 12 to 19 words per minute (five letters being counted as one word); and

(c) Is able to adjust the apparatus ordinarily used in some well-known system of radiotelegraphy so as to suit the varying conditions of working without using excessive transmitting power; and

(d) Has an efficient working knowledge of the regulations applicable to the exchange of the radiotelegraphic traffic.

(2) Candidates for examination shall fill up an application according to Form A attached hereto, and submit the same to the Minister of Communications at Bangkok.

(3) Upon being notified that he has successfully passed the examination each candidate shall supply two photographs of himself, one of which will be attached to the certificate of competency, and the other to the duplicate of the certificate which is retained by the Minister of Communications. These photographs will be signed by the candidates and stamped by the issuing officers in such a way as to prevent substitution.

(4) A fee of 10 Bahts will be charged for each examination and an additional fee of 10 Bahts for the certificate issued to a successful applicant.

(5) Each certificate shall be good for five years and may be renewed at the expiration of that period for a like period of five years. Such renewal may be without re-examination if

the applicant has been engaged in the actual transmission and receipt of radiotelegrams during at least three of the preceding five years. Otherwise an examination will be required. The fees for renewal examinations and the issuance of renewal certificates are the same as for the original examination and issuance.

(6) If the candidate satisfactorily passes the examination, he shall make a declaration that he will observe the secrecy of radiotelegrams which come to his knowledge in the course of duty.

FORM A.

Application for examination for a..... class certificate of competency as a radiotelegrapher.

1. Name
2. Residence
3. Date and Place of Birth.....
4. Nationality
5. System of radiotelegraph in which applicant wishes to be examined

The undersigned applicant for examination for a certificate of competency as a radiotelegrapher agrees that, if successful, he will observe all requirements, so far as they may apply to him, of the International Radio-Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457, the Regulations used in pursuance thereof, and all amendments and modifications of any of these, which may be issued from time to time.

(Signature).....

FORM B.

....CLASS CERTIFICATE OF COMPETENCY.

Whereas,.....having been examined as to his competency as a radiotelegrapher, according to the Regulations in such case made and provided and said examination having been successfully passed.

It is hereby certified that.....is able to send and receive by sound messages in plain language in the International Morse Code at the rate of.....words per minute (five letters being counted as one word) and is able to adjust the apparatus ordinarily used in the.....system of radiotelegraphy so as to suit varying conditions of working, without using excessive transmitting power and has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

Accordingly this.....class certificate of competency has been issued to the said.....who by accepting it agrees to be bound, so far as they may apply to him, by all provisions of the International Radiotelegraphic Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law B. E. 2457, and the Regulations issued under the authority thereof, and any amendments and modifications of any of these which may be issued from time to time.

Signed and delivered by.....
Minister of Communications.

BACK.

- Name
- Residence
- Date and Place of Birth
- Nationality

I do hereby declare that I will observe the secrecy of radiotelegrams which come to my knowledge in the course of duty.

(Photograph.)

THE RADIOTELEGRAPH AMENDMENT ACT.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas the authority conferred upon the Minister of Communications by virtue of Article 13 of the Radiotelegraph Act B.E. 2457 is not sufficient to execute and control the Radiotelegraph service.

Therefore His Majesty has been pleased to further amend the Radiotelegraph Act B.E. 2457 as follows:—

(1) This Act shall be called the Radiotelegraph Amendment Act 2464.

(2) It shall come into force from the 4th day of August, 1921.

(3) In Chapter VI Article 13 after paragraph 3 of the Radiotelegraph Act B.E. 2457, the following paragraph shall be inserted, namely:

It shall also be lawful for him, whenever he deems expedient, to issue notifications granting temporary permission to ships to send and receive messages by means of their wireless apparatus while in Siamese territorial waters. Given on the 4th day of August, 1921, being the twelfth year of the Present Reign.

SIERRA LEONE

(See also Map Section)

SIERRA LEONE proper consists of a peninsula about 26 miles long and 12 miles broad covering an area of about 300 square miles. The Colony, however, is much more extensive, stretching from French Guinea on the north to the Republic of Liberia on the east and south-east, its total area being 4,000 square miles, with a population of 75,572.

The capital is Freetown, and the colonial administration is conducted by a Governor and Commander-in-Chief, assisted by Executive and Legislative Councils. The same officials also administer the "Protectorate," a term which applies to the territories, not being portions of the Colony of Sierra Leone, lying between 6° and 10° north latitude and 10° and 14° of west longitude.

CONTROL.

A wireless telegraphy station is installed at Freetown, and is owned and controlled by the African Direct Telegraph Company. Mr. A. H. Stilwell is the Superintendent in charge.

The regulation of wireless telegraphy rests solely in the hands of the Government. There are no wireless clubs or societies.

ADMINISTRATION.

The Sierra Leone wireless laws and regulations were first formulated in the Decree of 1903, and the Schedule founded thereon. In 1912 this Decree and the regulations in the Schedule were amended by Ordinance No. 19 with the Schedule which was thereto attached. In the following year (1913) these were in their turn replaced by Ordinance No. 11 with its accompanying Schedule, both of which we print below. A set of Regulations issued on July 16th, 1917, has been superseded by an additional set issued on May 12th, 1919, which will be found below.

The list of reprints included here covers:—

A—Ordinance No. 11 of 1913.

B—Schedule dated May 23rd, 1913.

C—Regulation No. 1 of 1919.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

No. 11 of 1913.

Be it enacted by the Governor of the Colony of Sierra Leone, with the advice and consent of the Legislative Council thereof as follows:—

1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. *Definition of "Wireless Telegraphy."*—In this Ordinance, "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. *License for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony, except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus aboard ships to be worked in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) *Schedule.*—The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any superior Officer of Police named in the warrant, and a warrant so granted shall authorise the Officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to be used or intended to be used for wireless telegraphy therein.

7. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Repeal* No. 22 of 1903, No. 19 of 1912.—The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy Amendment Ordinance 1912, are hereby repealed.

SCHEDULE—SECTION 5 (2). REGULATIONS.

B 1. All apparatus for Wireless Telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations, "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Passed in the Legislative Council this twenty-third day of May in the year of our Lord, one thousand nine hundred and thirteen.

REGULATIONS (No. 1 OF 1919) MADE UNDER SUB-SECTION (1) OF SECTION 5 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913 (No. 11 OF 1913).

C Whereas by sub-section (1) of section 5 of the Wireless Telegraphy Ordinance, 1913 (No. 11 of 1913), it is provided that the Governor may from time to time make regulations for carrying into effect the purposes of the Ordinance:

And whereas by sub-section (2) of section 5 it is provided that the regulations made and passed by the Legislative Council, 23rd day of May, 1913, shall have effect except in so far as they shall be amended or rescinded by regulations made under the authority of the section:

And whereas by regulations made the 16th day of July, 1917, certain of the above recited regulations were rescinded and other regulations were substituted therefor:

And whereas I am minded to make other provision in lieu of the last above recited regulations:

Now, therefore, under and by virtue of the power and authority in that behalf vested in me it is ordered that the regulations made the 16th day of July, 1917, are hereby rescinded and the following substituted therefor:—

1. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made this 12th day of May, 1919.

SOLOMON ISLANDS

(See under NEW GUINEA.)

SOUTH AFRICA (UNION OF)

((See also Map Section)

Including: Provinces of Natal, Zululand, Transvaal, Orange Free State and South-West Africa.

THE Union of South Africa lies between 22° and $34^{\circ} 50'$ S. latitude and $16^{\circ} 30'$ and $32^{\circ} 40'$ E. longitude. Its total superficial area, not including the Protectorates of Bechuanaland, Basutoland, and Swaziland, which are included within the same geographical boundaries, but do not form part of the Union, is 473,089 square miles. At the last census the population was 6,922,813. The Union was constituted on May 31st, 1910, under the South Africa Act of 1909, and embraces the former separate self-governing colonies of the Cape of Good Hope, the Transvaal, the Orange Free State, and Natal.

The Executive Government is vested in a Governor-General appointed by the Crown, aided by an Executive Council of Union Ministers, with two Houses of Legislature.

CONTROL.

The administration of radiotelegraphy is in the hands of the Postmaster-General and is not treated as a separate unit.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Major E. A. Sturman, C.B.E.	Postmaster-General	Pretoria
Lt.-Col. N. Harrison, C.M.G., D.S.O., M.I.E.E.	Secretary to the General Post Office	Pretoria.

ORGANISATION.

There are three wireless stations in South Africa, under the control of the Union Government. The first was established at Durban in June, 1910, another at Slangkop, near Cape Town, in May, 1911, and a third at Port Elizabeth, in April, 1921. In September, 1913, it became necessary in connection with the port defences to remove the Durban station from the position where it had been originally erected to a point some four miles distant. The change of situation has not adversely affected its efficiency.

There are no privately owned stations, but licenses are issued for private wireless telegraph stations.

The latest available statistics are as follows:—

Land stations for public service to ships	..	3
Ship stations on privately owned vessels	..	6
Ship stations on railway owned vessels	..	2

ADMINISTRATION.

The only statutory regulation on radiotelegraphy within the Union is that contained in the preamble to the Post Office Act, and Section 80 *ibid.*, both of which will be found below.

An agreement has been entered into between the Government and the Marconi Company for the erection, under license, of a powerful radio station capable of communicating with England. The terms of the license are for either the taking over by the Government or the renewal of the license every ten years.

The Station when completed will be about twice as powerful as that of Saint Assise near Paris.

There is no Union Act compelling ships trading in South African waters to be fitted with radiotelegraphic apparatus.

A—Statutory Regulation (Preamble to P.O. Act, 1911).

B—Section 80 of Post Office Act, 1911.

C—License to establish and work a Private Wireless Telegraph Station.

POST OFFICE ADMINISTRATION AND SHIPPING COMBINATION DISCOURAGEMENT ACT, 1911.

CHAPTER V.—SECTION I.

A In this Act, unless inconsistent with the context, "telegraph" shall include "telephone," and shall mean any system or means of conveying signs, signals, sounds, or communications, by the agency of electricity, magnetism, electro-magnetism, or by any agency of a like nature, whether with or without the aid of wires, and shall include the system commonly known as wireless telegraphy, or aetheric signalling, and any improvements or developments of that system.

"Telegraph line" shall include any apparatus, instrument, pole, mast, standard, wire, pipe, tunnel, pneumatic or other tube, thing, or means whatever, which is or may be used in connection with or for the purpose of sending, transmitting, conveying, or receiving telegraphic signs, signals, sounds, or communications.

1. The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purposes of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(b) The Postmaster-General may construct, maintain, or lease telegraph lines for private use or may, by license, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

POST OFFICE ADMINISTRATION ACT, 1911.

B 80. (1) The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purpose of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(b) The Postmaster-General may construct, maintain or lease telegraph lines for private use or may, by license, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

(2) No telegraph line shall be used for the purpose of transmitting or delivering telegrams for the public except by the authority of the Postmaster-General and upon such terms and conditions as he may prescribe, and the department shall have the right, by means of its officers, of inspecting all offices which are authorised to accept, transmit, or deliver public telegrams.

UNION OF SOUTH AFRICA.

DEPARTMENT OF POSTS AND TELEGRAPHS.

License to Establish and Work a Private Wireless Telegraph Station.

C Under the provisions of section 80 of the Post Office and Shipping Combinations Discouragement Act, 1911, a license is hereby issued to establish and work apparatus for wireless telegraphy at provided such apparatus shall be of the character specified in the schedule hereto.

The licensed apparatus shall at all times be under the control of the licensee and no other person shall be allowed to transmit signals by means of the licensed apparatus.

No signals shall be transmitted other than such as are necessary to test the licensed apparatus or to aid research in wireless telegraphy by the licensee.

The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established within the Union or the territorial waters thereof.

The licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General of the Union of South Africa and shall at any time cease to work or shall completely dismantle the licensed apparatus upon notice so to do in writing from the Postmaster-General.

The licensed apparatus shall not without the consent in writing of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

The licensee shall at all times indemnify the Postmaster-General against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

The licensee shall not divulge to any person (other than properly authorised officials of the Government of the Union of South Africa or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon the premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any telegraphic instruments and apparatus fixed or being in such places and the working and user of such apparatus and telegraphic instruments respectively.

All apparatus used by the licensee shall be so placed and used as not to interfere with the efficient or convenient maintenance, working or use of any telegraph line of the Postmaster-General which may from time to time exist.

In case any telegraphic line of the Postmaster-General shall be damaged or the efficient working or user thereof shall be interfered with and the Engineer-in-Chief for the time being of the Department of Posts and Telegraphs shall certify in writing under his hand that such damage or interference has been caused by any apparatus used by the licensee or by anything done by or on behalf of the licensee in relation thereto the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order and in adding thereto or substituting therefore either temporarily or permanently any other telegraphic line if the said Engineer-in-Chief shall certify that such addition or substitution is reasonably required.

For the purpose of this license the expression "telegraph line" has the same meaning as in the Post Office Administration and Shipping Combinations Discouragement Act of 1911.

Except with the consent in writing of the Postmaster-General the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefit of all or any of the licenses, powers, or authorities hereby granted.

If and whenever an emergency shall have arisen in which it is expedient for the public service that the Government of the Union of South Africa shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Postmaster-General or the Secretary for Defence by warrant under his hand to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the said Postmaster-General or Secretary for Defence may enter upon the premises of the licensee and take possession thereof and use the same as aforesaid.

The Postmaster-General may at any time at his absolute discretion give notice in writing to determine this license hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall

cease and determine accordingly but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

Nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General.

Any notice (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of the Secretary or any one of the Assistant Secretaries for the time being of the Department of Posts and Telegraphs, and may be served by sending the same in a registered letter addressed to the licensee at the usual or the last known residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office, Pretoria.

The licensee shall pay to the Postmaster-General in respect of this license hereby granted a fee of ten shillings.

J. W. BUXTON FORMAN,
Postmaster-General.

Signature of licensee _____
Dated at _____ this _____ day of _____ 192 _____

Schedule in license granted to
to establish and work apparatus for reception
of wireless signals.

AERIAL.

Extreme height above ground not to exceed 100 feet.

Total length of aerial, including leading-in wires :—

- (a) 100 feet for single wire aerial.
- (b) 140 feet wire where two or more wires are used, e.g., total length of 70 feet of double wire.

Schedule in license granted to
to establish and work apparatus for wireless
telegraphy.

Power to consist of not more than 50 watts.
Wavelength not to exceed 200 metres.

AERIAL.

Extreme height above ground not to exceed 100 feet.

Total length of aerial, including leading-in wires :—

- (a) 100 feet for single wire aerial.
- (b) 140 feet wire where two or more wires are used, e.g., total length of 70 feet of double wire.

Signals to be exchanged with _____

SPAIN

(See also Map Section)

Including • Canary Islands, Fernando Po.

THE present Constitution of Spain after having been drawn up by the Government and laid before a *Cortes Constituyente* elected for its ratification, on March 27th, 1876, was proclaimed on June 30th of that year. It enacts that Spain shall be a Constitutional Monarchy, the Executive vested in the King, and the power to make laws "in the Cortes with the King." The reigning monarch, Alphonso XIII, belongs to the House of Bourbon, which succeeded to the Spanish throne at the end of the seventeenth century. He married Princess Victoria Eugenie, granddaughter of the late Queen Victoria, on May 31st, 1906.

The territory included under the Spanish administration comprises 49 provinces, 47 in the Iberian peninsula and 2 provinces, namely, Canary and Balearic Islands, and as colonies, Fernando Po Island, the Muni coast and Rio de Oro, and Ceuta and Melilla, in Morocco.

The superficial area of the 47 provinces in the Peninsula and the Balearic Islands is 191,985 square miles, and the population 20,783,844.

CONTROL.

Radiotelegraphy in Spain is a State monopoly, under the control of the Home Office and the Ministry of War and the Navy. The establishment of a wireless public service was granted on June 26th, 1908, to "La Sociedad Española Oerlikon," which was responsible for the erection of 24 land stations having three different ranges. The "Sociedad Española Oerlikon" then formed a company "Compañía Concesionaria del servicio público español de Telegrafía sin hilos," which erected the Cadiz, Tenerife, and Las Palmas stations, but did not complete them. The time granted in the contract having elapsed, the concession was then transferred to the actual holders of it, "La Compañía Nacional de Telegrafía sin Hilos," which was formed with the aid, and under the direction of Marconi's Wireless Telegraph Company, Limited, and at the suggestion of the latter, the original plan was altered and reduced to 10 stations, all of greater range.

Licenses for erecting and working wireless stations by private companies are not granted, except in the case of teaching or meteorological receiving stations. According to the latest statistics the following stations exist:—

Meteorological observatories	.. .. .	4
Official seismological stations	.. .. .	4
Educational stations	.. .. .	7
Stations open for public service to ships	.. .. .	8
Stations open for Government traffic only	.. .. .	13
Stations open for private traffic	.. .. .	2

There are no *experimental* stations and no *amateur* stations.

There is no special form of license, and the general conditions subject to which these licenses are granted can be found in the addition to Article 6 of the Royal Decree of January 24th, 1908, which Article was modified by Royal Decree of July 19th, 1914, also Article 6 of Royal Decree of February 8th, 1917, and Royal Decree of January, 1920.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address
Excmo. Sr. D. Vicente Pinies y Bayona	Home Minister	General Arrando 21.
Excmo. Sr. D. José Sanchez Guerra	War Minister	Claudio Coello 18.
Excmo. Sr. D. José Rivera y Alvarez de Castro	Navy Minister	Travesía de la Ballesta 7 dpdo.
Illmo. Sr. D. Luis Rodriguez de Viguri	Director - General of Posts and Telegraphs	General Porlier 50.
Sr. D. José Moreno Pineda	Sub-Director of Telegraphs.	Barquillo 30-pral.
Sr. D. Agustin Boyer	Head of Radio Service	Alcalá 133.

The only company holding permission to work wireless for public service is the "Compañía Nacional de Telegrafía sin Hilos."

The companies engaged up to the present in erecting wireless stations are the following: La Compañía Nacional de Telegrafía sin Hilos (Marconi system), A.E.G. Ibérica de Electricidad (Telefunken), La Compañía Ibérica de Telecomunicación, Centro Electrotécnico (Army Department), and Military engineers (for military purposes).

ORGANISATION.

Radiotelegraphy has from its initiation in practice, attracted much attention and interest in the Iberian Peninsula.

As early as 1899 commissions were appointed in Spain which, from time to time, issued reports to their Government on the subject of Wireless Telegraphy. As a result, a Royal Decree of May 21st, 1905, appointed a permanent commission, presided over by the Chief of the General Staff and including representatives of the War Office, Admiralty and Home Office, thus anticipating the first International Conference concerning Wireless Telegraphy—i.e., the one held in Berlin, 1906 (subsequently modified by the London International Convention of 1912).

Very little was actually done in regard to the erection of wireless telegraphic installations before 1906. Trials with unsatisfactory results had been carried out by the Army with field sets, and the Navy with stations on board the *Pelayo*, *Princesa de Asturias*, and *Giralda*. In regard to aviation, there is a project to install several stations on the aerial line of Toulouse-Rabat. The station at Prat de Llobregat is already handling traffic for this line. At Alicante another station has been installed for meteorological service and aviation. The lines of Madrid-Larache and Cantabrico (Postal Aviation) is also to be equipped with several radiotelegraphic stations.

A commission is setting out to study the establishment of various stations on the coast of Spain for Radiogoneometric Service, but up to the present it has not determined the sites of these stations.

For the service of lighthouses two radiotelegraphic-telephonic stations have been installed at Castelloñ and Columbretes, and tenders have been invited for the equipment of various other lighthouses, amongst which are Cabos Villano and Finisterre.

ADMINISTRATION.

Spain is one of the signatories of the important "Safety of Life at Sea" Convention, and has become a party to all the international agreements affecting radiotelegraphy. She has, moreover, passed separate laws and regulations framed with the object of establishing and developing this applied science in the home country and in her dependencies.

In the course of 1917 an important Royal Order was published by the Ministry of Marine, enacting that every merchant vessel of 500 tons and over must install wireless telegraphy. The text of this Order will be found below together with the following current Rules and Regulations.

A—Law of October 26th, 1907.

B—General Rules, January 24th, 1908.

C—Regulations, January 24th, 1908.

D—Royal Order of September 4th, 1914.

E—Royal Decree dated February 20th, 1917.

F—Royal Order of June 22nd, 1917.

G—Decree dated October 12th, 1917.

H—Royal Decree of February 8th, 1917.

I—Convention of Madrid, dated June 17th, 1918 (as modified on June 4th, 1919).

J—Royal Decree of January 18th, 1920.

LAW OF OCTOBER 26TH, 1907.

THE GOVERNMENT OF SPAIN IS HEREBY AUTHORISED TO ESTABLISH AND DEVELOP THE WIRELESS, CABLE AND TELEPHONE SERVICES.

A grace of God and by the Constitution, makes it known by these presents that Parliament has decreed and he, the King, has given his Royal assent to the following:—

ART. 1.—The Government is hereby authorised to establish and develop the wireless, cable and telephone services—availing itself of the co-operation of national institutions—by

means of a Royal Order which will be published within four months from the promulgation of this law.

ART. 2.—The expenses entailed by each service will be covered by the takings of the concession itself. In the case of certain concessions, the proviso is reserved that the establishment may be taken over by the State in whole or part, by Royal Decree, should the so doing be considered as in the national interests.

ART. 3.—Concessions regarding these new services will be granted by public tender, and

all necessary conditions must be fulfilled in order to safeguard the interests and security of the nation.

It is therefore decreed :

That all tribunals, magistrates, prefects, governors and all persons in authority, whether civil, military or ecclesiastical, whatever their rank and dignity, must obey and see to it that this law is observed in all its parts.

Given at the Royal Palace on October 26th, 1907.

GENERAL RULES.

PROMULGATED BY ROYAL DECREE AS THE BASIS FOR THE ESTABLISHING OF WIRELESS SERVICE IN SPAIN.

BART. 1.—The establishing and exploitation of all systems and apparatus available for the so-called "Hertzian telegraphy," "etherial telegraphy," and "radiotelegraphy," and all similar processes already invented or which may be invented in the future, shall be considered as included among the State monopolies regarding all means of electrical communications.

ART. 2.—The establishing and exploitation of the above telegraphic systems shall be controlled by (1) the Minister of the Interior in all matters appertaining to the general civil applications of the said systems, and (2) by the Ministers of War and Marine when and where those applications are specially connected with national defence and with the army and navy.

ART. 3.—All other official departments requiring a radiotelegraphic service can erect wireless installations by previous agreement with the Minister of the Interior. Such installations will be under the regulations established for the regular wireless service and wireless experiments.

ART. 4.—No experiments with the above-mentioned systems can be instituted in the Peninsula, or in the Balearic and Canary Islands, or in Spain's African possessions, without the authority of the Ministers of War, Marine or Interior, according to the kind of experiment which it may be proposed to carry out. Such experiments and trials shall be carried out under the official inspection of the respective departments responsible, excepting only those of a technical character carried out by the personnel of the scientific institutions of the State. These shall be independent of the said departments, providing they adhere to the regulations laid down.

ART. 5.—The Minister on whose authority the above installations and experiments are established and effected must give notice thereof to the other Ministers, giving them also full particulars regarding their service and conditions.

ART. 6.—Acting in agreement with the Ministers of War and Marine, in the cases herein aforesaid, and acting independently in all other cases, the Minister of the Interior can authorise the installation of wireless stations, provided that none have been officially installed, when the said installations may have been applied for by individuals, societies, corporations or national institutions, subject to the following rules:—

(1) The applicant shall address himself in the first instance to the Minister of the Interior, stating clearly the place where the installation is to be erected, and supplying a plan of the building, together with the conditions and advantages of the locality.

(2) Such installations and the services they are expected to render shall be subject to the special rules and conditions laid down in each case, and to the general regulations established by the State for its own installations and wireless service.

(3) The Government shall have the right to close the service under extraordinary circumstances affecting the safety of the State and the maintenance of public order.

(4) The Government shall also have the right to acquire by purchase, whenever it may be considered convenient, and with the previous payment of an indemnity, the wireless installations hereinbefore mentioned and the valuation for such compensation shall take into consideration the actual condition of the material and of the installation itself.

(5) The concessionaire shall let the Minister of the Interior know, in good time, the date on which the station or stations will start working, in order to allow the personnel of the telegraph office the necessary time for their inspection.

(6) The petitioner must not consider himself entitled to proceed with the work of installation until the necessary authorisation has been granted.

The following rules were added by Decree of July 19th, 1914.

(7) If the stations are to be fitted up merely for the reception of messages and for scientific purposes, or to serve as auxiliaries to meteorological observatories, authorisation for the same can be obtained from the Minister of the Interior, provided that the application be made by an Official Institution or by a private individual acting with the support of an Official Department.

(8) These receiving stations must be inspected by the Director of Telegraphs of the locality where they are installed.

(9) The persons appointed to carry out the reception must take an oath before the Civil Governor of the Provinces, to keep secret all information they may gather from the radiotelegraphic messages.

ART. 7.—The ships belonging to the national mercantile marine can install on board wireless stations worked on any of the wireless systems in current use, provided they obtain a special permit to do so from the Minister of Marine, who will grant it in accordance with the conditions established by the International Agreement and Service Regulations adopted in Berlin on November 3rd, 1906.

ART. 8.—Permits to establish wireless installations will not be granted to any private individual, society, or corporation belonging to a foreign nationality.

ART. 9.—Any person or persons exploiting or using clandestinely any system of wireless, or any person or persons attempting to conduct wireless experiments with apparatus available for the purpose, will be prosecuted in conformity with the Penal Code, the general law, the military orders, or the administrative regulations, as the case may be. Prosecution for these offences will be carried out by the authorities entrusted with the administration of the said laws, orders and regulations; and the State will confiscate all material employed for such purposes.

ART. 10.—By agreement between the Ministers of War, Marine and Interior, the wireless stations which may be considered necessary and convenient for commerce, navigation and national defence will be erected on

the seaboard of the Iberian Peninsula, on the Balearic and Canary Islands, and in the African possessions of Spain.

These installations will be under the control of the aforesaid three Ministers, as the case may be, both in the matter of supplies and of personnel and offices, and they will form a part of the national telegraphic system.

This linking up of the wireless with the land telegraphic service will be effected by the ministerial department controlling the various wireless installations.

ART. 11.—Authorisation is hereby given for the interchange of messages between ships belonging to the national mercantile marine and those belonging to foreign nations carrying wireless installations of current systems, and also for the interchange of messages between the said ships and the coast stations already established or to be established by the Ministry of the Interior on the sea board of the Peninsula on the Balearic and Canary Islands, and in the Spanish possessions in Africa.

The Minister of the Interior shall determine the date of the inauguration, the extension and the class of service of each station.

ART. 12.—The Government shall have the option of refusing or accepting those wireless systems the details of which have not been made public.

ART. 13.—The State accepts no responsibility for the wireless service. In the cases of errors or of non-delivery of radiotelegrams the procedure followed will be as established in Art. 35 of the Berlin regulations.

ART. 14.—Whatever the object of the installations, the wireless service shall be organised, whenever possible, in such a way as not to disturb other services of the same kind, or class. The ministerial departments interested shall adopt in each case such rules and regulations as may be found necessary, and shall also arrange regulations with other States regarding frontier installations.

ART. 15.—All wireless services, whether public, official, or private, carried on through the intermediary of land, coast and ship stations, shall be subject to the regulations hereunto attached.

ART. 16.—In addition to the rules herein contained, and those of the regulations mentioned in the previous Article, the provisions affecting Radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, must be observed.

ART. 17.—The Director-General of Posts and Telegraphs shall see to the fulfilment of the stipulations made by Art. 13 of the International Agreement and of those made by Art. 37 of the Berlin Regulations, regarding the International Bureau established in Switzerland. The Ministers of War and Marine shall in accordance thereunto furnish the data required, which must be in the possession of the naval and military installations and stations and also data affecting the merchant ship stations, whose installations are authorised by the Minister of Marine.

ART. 18.—Messages received from or transmitted directly to a country or ship registered in a country which is not a signatory of the convention and regulations of Berlin, can only be admitted through the Spanish telegraphic system and through the coast wireless stations after a declaration has been made by the country in question expressing an intention of applying the rules laid down by the said convention, and their regulations regarding the

regular routine of the messages and the security of the accounts. In their radiotelegraphic service the coast stations shall give preference to the service of those countries which have become parties to the international agreements.

Articles 19 to 34 and the additional articles appended thereto deal with wireless installations on fortresses.

REGULATIONS.

GOVERNING THE WORKING OF THE WIRELESS STATIONS IN SPAIN.

GENERAL SERVICE.

C ART. 1.—All persons are allowed to make use of the wireless service, but the Government reserve to themselves the privilege of suspending for an indefinite period, as they may judge convenient, either every class of communication or such communications as belong to some particular class, or communications which affect some special station or stations.

ART. 2.—The following regulations and conditions laid down for the radiotelegraphic service in Spain, besides the provisions affecting radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, shall be applied to all wireless stations, whether public, official or private, on the coast of the Peninsula, the Balearic and Canary Islands, the African possessions of Spain, and to all ships navigating those territorial waters.

ART. 3.—Ship stations shall be free to select their system of wireless installation; but for coast stations the administration shall adopt the system and equipment judged to be the best available from the point of view of scientific, technical and economic progress.

ART. 4.—All coast wireless stations shall be linked with the general telegraphic system, by means of private lines, in order to secure rapid communications.

ART. 5.—The working of wireless stations of all classes shall be carried out in such a way that, as far as possible, no disturbance may be occasioned to other stations of the same kind.

ORGANISATION OF WIRELESS STATIONS.

ART. 6.—Wireless stations of all kinds must maintain reciprocal communications with the least possible waste of power.

ART. 7.—Wireless stations in Spain shall use the international signals of the Morse Code for the transmission of messages.

ART. 8.—All wireless installations in Spain including both coast and ship stations, open to the public, must carry on an interchange of messages irrespective of their wireless systems.

During the working hours fixed for each coast station the latter must receive the Morse signals and must also have a transmitter so disposed as to be able to reply in the signals of the same code.

ART. 9.—Coast wireless stations must accept and must give *absolute priority* to calls for help from ships in danger. They must, moreover, answer the said calls in the same order of priority and pass them on as urgent messages to the general telegraphic service.

ART. 10.—The administration shall establish three classes of stations—viz., public, official, and private. Those of the first class must have a radius of 600 kilometres and over, those of the second class one of 400 kilometres (there or thereabout), and those of the third class one of 200 kilometres. Exceptions may be made in accordance with practical experience in working.

ART. 11.—First-class stations shall have three wavelengths at their disposal—namely, one of 300 metres, another of 600 metres, and another which may reach the maximum length, but which must not be less than 1,600 metres. The last two will be used normally. The second and third class stations shall have two wavelengths—namely, one of 300 metres and one of 600; and those of the second class will use normally the 600 metres wavelength, whilst those of the third class will use one of 300 metres, except in the cases referred to in ART. 14 final paragraph.

Coast stations situated near each other may maintain a special service between each other, provided that the distance between them allows of their doing so; but they must give preference to the Maritime Service. In the latter case, and for communications with national vessels on official matters, coast stations of both classes are allowed to use the special wavelengths to which their installations are adapted or adaptable for these services.

ART. 12.—Ships belonging to the Spanish Merchant Service shall use a normal wavelength of 300 metres, but they can alter this to a maximum of 600 metres.

Only in exceptional cases are vessels of small tonnage allowed to use *normal waves* of less than 300 metres.

ART. 13.—The General Post and Telegraph Office shall publish and keep always up to date a Directory showing the coast and ship wireless stations authorised and open to the public; together with the following information:—

(1) Name and geographical position of the coast station; identification signal in the International Code, and the port of register of the ship fitted with wireless.

(2) Call letters. (These must be all different and must be formed by groups of three letters.)

(3) Normal range.

(4) Wireless system adopted.

(5) The class of receiving apparatus whether automatic of auditive, etc.

(6) Length of waves used by the station. (The normal-wave must appear in italics.)

(7) Class of service rendered by the station. This covers such items as general communication, restricted communication (*i.e.*, communication with ships, with steamship companies, with ships fitted with apparatus of the same system, etc.); public long distance communications; communications of a private nature; special communications (*e.g.*, those of an exclusively official character), etc.

(8) Hours of service.

(9) Coast and ship station rates.

The Directory above-mentioned shall also include information regarding wireless stations not open to general public service and the existence of which has been made known to the International Bureau by the Spanish Administration.

ART. 14.—Wireless service in coast stations shall be, whenever possible, of a continuous nature, operating both night and day without interruption.

The Post and Telegraph Office shall fix, in each case, the hours of service of those stations where the service is limited.

Coast stations where the service is not of a continuous nature cannot close for the day without having transmitted all radiotelegrams to ships within their sphere of action and without having first received all the radiotelegrams advised by them. This proviso

shall also apply in the case of ships signalling their presence before the closing hour of the station.

ART. 15.—Private corporations cannot install ship stations nor can they work any such station without Governmental authorisation. Permits in these cases will be issued in accordance with the provisions of the Berlin Convention and Regulations, by the Ministry of Marine, and will be communicated by the latter to the General Post and Telegraph Office.

Ship stations duly authorised must fulfil the following conditions:—

First.—The system employed must be a tuned system.

Second.—The speed, both for the reception and transmission of messages, must not under normal circumstances be less than twelve words per minute, allowing five letters to the word.

Third.—The power transmitted to the wireless apparatus must under normal circumstances, not exceed one kilowatt. Nevertheless, greater power can be used if the ship is obliged to communicate over a distance exceeding 300 kilometres from the nearest coast station; or, if by reason of any interference, no communication can be established without increasing the power.

The service of the coast and ship stations shall be attended to by operators having their qualifying certificates issued by the General Post and Telegraph Office. This certificate must state the professional knowledge of the operator in the following matters:—

(a) Equipment of the apparatus.

(b) Auricular transmission and reception at a speed of not less than twenty words per minute.

(c) The knowledge of the regulations regarding interchange of wireless communications.

The qualifying certificate must also state that the Government has notified the operator that it is his duty to treat all communications as confidential.

Steamship companies are allowed to employ their own qualified operators provided they fulfil the conditions hereinbefore mentioned.

THE MAKING-OUT AND PRESENTATION OF MESSAGES.

ART. 16.—For the making-out and presentation of radiotelegrams the provisions of Articles 10, 11 and 33 of the Berlin Conference Regulations, in addition to the rules laid down in the following Articles, shall be observed.

ART. 17.—Radiogram forms must have the words Radio Service on the heading.

On the transmission of messages from ship to coast stations no mention will be made of the date and hour of deposit.

On the re-transmission of the telegraph lines the coast stations shall note their own name as that of the station of origin, followed by the name of the ship, and shall register as the hour of transmission the time at which the radio was received by them.

ART. 18.—The instructions for delivery of messages destined for ships at sea must be as complete as possible. The form must be filled up as follows:—

First.—The name of the addressee with additional indications if necessary.

Second.—The ship's name as it appears in the Directory, adding her nationality, and if necessary, as in cases where there are two or more ships of the same name, adding also her identification letters in the International Code.

Third.—The coast station name as it is given in the Directory.

ART. 19.—The following messages will not be admitted :—

- (1) Reply-paid messages.
- (2) Money orders.
- (3) Messages to be paid on delivery.
- (4) Messages demanding acknowledgment of reception.
- (5) Messages to be forwarded.
- (6) Messages at special rates, except those for transmission on the telegraphic section or over-land wires.
- (7) Messages marked "urgent" except on the over-land wired service, and then only with the reservation that the provisions of the international telegraphic regulations must be applied.
- (8) Messages to be forwarded by post or express.

ART. 20.—The messages may be written in plain language or in code in accordance with the interior regulations for ordinary service and with the international conventions on the matter.

ART. 21.—The officials at the stations can ask the senders of wireless messages to prove their identity.

RATES AND EXECUTIVE REGULATIONS.

ART. 22.—In the counting of words in order to apply the rates the officials must follow the provisions of Articles 18, 19, and 20 of the International Telegraph Service Regulations as revised in London in 1903.

ART. 23.—In conformity with Article 10 of the Berlin International Convention, the total rate for wireless messages shall include :—

- (1) The rate applicable to the maritime section, namely,
 - (a) the rate in force at the coast station.
 - (b) the rate in force at the ship station.
- (2) The rate established for the overland wired service, national or international, calculated in accordance with the general rules.

ART. 24.—The rate applicable to the maritime section is hereby fixed at 0.75 pesetas per word, of which 0.45 belongs to the coast station and 0.30 to the ship station.

With regard to the international service, in the case of messages to and from foreign ships, these rates shall be payable in francs, on the same basis.

The rate applicable to the overland wired service, national or international, shall be calculated and allocated in accordance with the interior regulations and with the international regulations.

The minimum rate applicable to the maritime section of wireless messages is hereby fixed at 7.50 pesetas, which is the wireless rate for a radiogram of ten words.

ART. 25.—The coast station rate will be charged only once, even if the message goes through several coast stations.

ART. 26.—The whole cost of the radiotelegram must be paid by the sender, and at ship stations a tariff indicating this must be displayed.

ART. 27.—For the purposes of book-keeping the coast station must consider itself as addressee with regard to the messages coming from the telegraphic service on their way to ship stations; and the coast station must consider itself as the original office with regard to the messages coming from ship stations for transference to the telegraphic service.

ART. 28.—Coast and ship station rates shall be calculated in accordance with the number of words computed, and in accordance with Article 23 of these Regulations.

ART. 29.—Merchant ships at sea can interchange messages if they find it convenient. The rates to be charged in such cases shall be laid down by the respective owners, and shall not be taken into account by the National Administration.

ART. 30.—Ship stations on Spanish vessels shall send to those chartering them, upon their arrival in port, all documents in connection with and referring to all messages exchanged with coast stations. The charterers shall send such documents monthly to the General Post and Telegraph Office, where it will be kept for a minimum period of twelve months and where liquidation of the accounts must be made in due course.

ART. 31.—The installations on Spanish men-of-war shall use, in their communications with the coast stations open to the public, the wavelengths which—under the terms of the Berlin Regulations—may be agreed upon between the Minister of Marine and the Minister of the Interior for the official service.

Both Spanish and foreign men-of-war can exchange private messages with the coast stations or with merchant ships; but only for the benefit of their crews. In such cases the technical and tariff provisions of these Regulations and those of the Berlin Convention and the Berlin International Regulations for the transmission of public correspondence, must be observed, as in the case of a merchant ship station open to the public. The regulations established to prevent the disturbance of wireless communications must be most carefully adhered to.

ART. 32.—When men-of-war exchange messages (private) with coast stations or with other ship installations they must follow the rules established for the computation of words and the collection of rates. In such cases the ship's purser in the Spanish vessels and the Minister of Marine shall respectively exercise similar functions to those assigned to the administration on board, and to the owner, as far as merchant ships are concerned.

In the calculation of coast and ship station rates for private service exchanged with foreign men-of-war, the General Post and Telegraph Office shall come to an understanding with the Administration of the country to which the said men-of-war belong.

ART. 33.—The same provisions shall hold good in the case of a military wireless installation, either permanent or portable, when the said installation utilises the stations established by the Administration for Public Service.

ART. 34.—Should, by some accident, the Submarine Cable Service be substituted for the Wireless Service for the sending of a message, the former shall only receive the rate applicable to a coast station. If communication by wireless is established between two points in Spanish territory otherwise without telegraphic communication, the rates charged shall be those of the Interior Telegraphic Service, and the rules of that service shall apply, except in the cases provided for in Article 19 of these Regulations.

ART. 35.—In the matter of transmission of messages, of the signals to be employed in them, orders of transmission, calls, acknowledgments of receipt, instructions as to the route to be followed by the radiograms, and

instruction as to their final destination, the provisions made in Articles 15 to 32, both inclusive, of the Berlin Regulations must be observed.

ART. 36.—In cases when the return of charges made for radiotelegrams has been justly established the provisions of Article 35 of the Berlin Regulations must be observed.

BOOK-KEEPING.

In matters referring to book-keeping for the international wireless service the provisions of Article 36 of the Berlin Regulations must be observed.

GENERAL RULES.

ART. 38.—Coast stations, previously authorised by the General Post and Telegraph Office, shall furnish the authorised agents of Maritime Information Bureau with all such particulars concerning wrecks and disasters at sea as are of any interest to navigators, always provided that the said agents apply for such information.

ART. 39.—Authorised interchange of messages between ship stations on the high seas must be carried out in such a way as not to disturb the coast station's service. The latter shall have, as a general rule, the right of priority for Public Service.

ART. 40.—The order of transmission between ship stations on the high seas shall be settled by agreement between themselves.

The re-transmission of messages between ships at sea shall be arranged by agreement between the interested parties.

ART. 41.—The provisions of the International Telegraphic Regulations shall be applied by analogy, to radiotelegraphic communication as far as they are not antagonistic to these Regulations, or the Convention, Additional Agreement, and the International Regulations of the Berlin Conference.

ART. 42.—The provisions of Articles 5, 6 and 9 of these Regulations shall apply to all classes of wireless installations, official and authorised, even if they are not open to Public Service.

Madrid, January 24th, 1908.

Approved by His Majesty the King
—Maura.

(Seal.)

ROYAL ORDER OF SEPTEMBER 4TH, 1914.

ART. 1.—According to the Royal Order of January 25th, 1908, the inspection and regulation of the Wireless Telegraph Service on board vessels of the Mercantile Marine are under the supervision of the Minister of the Navy, and by delegation to the Director-General of Fisheries and Merchant Shipping. The installations should fulfil all the requirements of the said Royal Order together with the rules and regulations of the London Radiotelegraph Convention of June, 1913, and the Rules of the Safety of Life at Sea Convention, January, 1914.

Everything affecting the service shall be controlled by the Navigation Department, which shall attend to the following matters:—

(1) The registration of all new installations authorised.

(2) The forwarding of all documents regarding such new installations accompanied by the order for their recognition.

(3) The sending of a report to the Home Office and War Office as to the result obtained from the various installations, together with indications of their characteristics.

To attend to this service the Director of Navigation and Fisheries will nominate a chief or a superintending official, together with five wireless inspectors on the coast, and this staff must have the qualifications as set forth in the Royal Order of May 21st last.

ART. 2.—The distribution of the staff on the coast and in the maritime provinces under each inspector shall be as follows:—

Barcelona.—Maritime provinces of Barcelona, Tarragona, Valencia, Mallorca, and Minorca (the residence of the inspector being at Barcelona).

Cartagena.—Maritime provinces of Alicante, Cartagena, Almeria, and Malaga, Melilla and Ceuta (the residence of the inspector being at Cartagena).

Cadiz.—Maritime provinces of Cadiz, Canary Islands and Huelva (the residence of the inspector being at Cadiz).

Vigo.—Maritime provinces of Vigo, Pontevedra, Villagarcia and Coruña (the residence of the inspector being at Vigo).

Bilbao.—Maritime provinces of Gijón-Santander, Bilbao and S. Sebastian (the residence of the inspector being at Bilbao).

ART. 3.—The wireless inspectors shall be under the orders of the Commandante de Marina of districts to which they are attached and in the ports of which they will have to make their annual inspection. They will only be allowed to leave their habitual place of residence when, for the convenience of the shipbuilders, they have to inspect a station in any other part of their district.

ART. 4.—The wireless inspectors must attend to the following duties:—

(a) To verify and inspect all new installations concerning which they may have been notified by the Director-General of Navigation and Fisheries that they are ready for public service, and to send in a report of the result of their verification and inspection.

(b) To visit annually the installations of such ships as are registered in the ports belonging to the districts within their jurisdiction, and to issue the necessary certificate according to the London Safety of Life at Sea Convention.

(c) To inspect foreign ship stations on board vessels which take passengers in Spain with the object of verifying that they are in possession of the certificate issued under the Safety of Life at Sea, which certificate must have been issued by the maritime authorities of their respective countries.

(d) To report to the Director-General all remarks or complaints made by the ship-owners, crew or passengers in regard to this service so that the aforesaid Director may take such necessary steps as he may think fit.

(e) To see that all the staff that work the installations are in possession of the Government certificate according to the law of January 24th, 1908, with the object of making sure that all these installations are handled by duly qualified operators.

ART. 5.—For these duties a register book will be given to the wireless inspector in which he shall note the following particulars of each visit:—

(a) Date and place of inspection.

(b) Name of the vessel.

(c) System, radius, wavelengths, etc.

(d) Names of operators and dates of their certificates.

A copy of this information is to be sent every quarter to the Director-General in order that he can make out a list and maintain a register devoted to all important information and data.

ART. 6.—The naval and marine authorities will do their best to facilitate the work of the inspector, putting at his disposal the *craft* and *personnel* required by him for the fulfilment of his duties.

ART. 7.—When it is desired to install a wireless station on board a ship, the builder, the owner, the agent or the captain must ask for permission from the Director-General of Navigation and Fisheries. As soon as the installation is completed the applicant must notify the above authority, stating the port in which he desires the visit to be made, so that the wireless inspector may receive instructions accordingly.

ART. 8.—Wireless installations are subdivided into three classes:—

- (1) Stations with permanent service.
- (2) Stations with limited service.
- (3) Stations with special service.

Class 1 includes all vessels which carry twenty-five or more passengers and which have an average speed of fifteen or more knots. This class includes also ships carrying 200 or more passengers, having a speed of over thirteen knots, and travelling a distance of over 500 miles between two consecutive ports. The latter vessels should carry at least two telegraphists.

To Class 2 belong all the steamers not included in Class 1, provided they are fitted to carry twenty-five passengers or more. During the voyage the ships of this class must have one telegraphist on constant watch during seven hours per day and ten minutes at the beginning of the other hours.

In cases where the vessel is more than 500 miles distant from the nearest coast, the watch must be permanent.

To Class 3 belong all ships which are not included in Classes 1 and 2, and having fifty or more persons on board and carrying less than twenty-five persons or none.

The watch service on these ships must be continuously maintained during a transatlantic voyage or when the ship is over 1,000 miles distant from the coast. In special circumstances, and whenever advisable for the safety of life at sea, ships of every class may be obliged to keep a constant watch.

Vessels belonging to subsidised Government lines are obliged to carry wireless no matter where they sail or what crew they carry.

ART. 9.—The radius of the wireless station shall be a minimum of 100 miles at sea in daytime when communicating with ships under normal conditions and circumstances.

All the stations must be provided with an emergency set, installed on the upper deck, which must be kept in the best condition, having a source independent of the main electric supply and capable of being set in instant working order; this set must be able to work during six hours at least, and must possess a radius of a minimum of eighty miles for ships of the first class and fifty miles for the others.

ART. 10.—When testing the transmission and reception of messages, both installations shall be made to work with a ship at a distance of about 100 miles.

The wavelength and the oscillation current of the aerials must be measured.

When the Director-General thinks it necessary, the curves of resonance will have to be made and the degrees of coupling adjusted. When it is necessary to test the state of the receiving apparatus, the Director may order that one or several of the officers in that service shall mark trial tests with the different stations at various distances during the voyage.

ART. 11.—Inspections must be made at the ports of Barcelona, Cartagena, Cadiz, Vigo and Bilbao, which are the places of residence of the wireless inspectors. However, if for the convenience of builders, the inspection should be carried out at some other port, these builders must defray the travelling expenses of the said inspector.

ART. 12.—The radio inspectors shall receive remuneration for all the inspections they carry out with regard to wireless installations.

The amount of this remuneration shall be 100 pesetas with an increase of twenty-five pesetas for each auxiliary transmitter which the ship may carry independent of the emergency installation. Such remuneration shall be the same whatever the rank held by the radio inspector.

The annual inspections held for the issue of certificates in accordance with the provisions of the London Safety of Life at Sea Convention shall be made free of charge.

(Signed) RAMON ESTRADA,
Director-General of Navigation and
Marine Fisheries.

Madrid, September 4th, 1914.

ROYAL DECREE DATED FEBRUARY 20TH, 1917.

Inscribed in the Official Record Under No. 49.

E His Majesty the King (whom God save) inspired by the sentiment of humanity, of which the crews of the merchant ships, which in these difficult times with bravery and with risk to their lives maintain our maritime commerce are deserving, has, in accordance with the proposal of the Director-General of Navigation and Sea Fisheries, designed to decree—

1. All merchant ships of 500 tons and upwards which make long sea voyages or long coasting voyages must carry a wireless installation having a minimum range of 100 miles, as laid down under the International Radiotelegraphic Convention.

2. Similarly the said ships will carry one or more lifeboats in proportion to the number of the crew, each fitted with its own motor, or provided with adjustable motors of such a kind as to answer the same purpose.

3. Local directors of navigation shall allow a certain time for each ship to be provided with these things, the shipowners having to certify before the said authorities that they have taken the necessary steps or made definite contracts to obtain them.

ROYAL DECREE DATED JUNE 22ND, 1917.

F In view of the request made by the "Cia Nacional de Telegrafia sin Hilos," His Majesty the King (whom God guard) has been pleased to order that all the radiotelegraphic stations concerned in the Royal Decree of Feb. 20th last inscribed in the Official Record under No. 49 shall carry emergency installations in accordance with Article 9 of the regulations for the service of installation and inspection of radiotelegraphy on board merchant ships on September 4th, 1914, excepting those installations which have

sources of energy independent of that which forms a regular part of the ship's equipment and is fitted on deck.

Madrid, June 22nd, 1917.

ROYAL DECREE DATED
OCTOBER 12TH, 1917.

Issued in the form of a Circular Published in the Official Gazette of the Spanish Ministry of Marine No. 235 of November 19th, 1917.

G In view of the collection of information by this Administration for the fulfilment of the Royal Orders of February 20th, and June 16th last (inserted in the Official Gazette of this Ministry and numbered 29 and 143 respectively) relative to the complete installation of wireless telegraphs on board merchant vessels of 500 tons and upwards, which are engaged in overseas and extended coasting trade, with a minimum range of 100 miles, on the conditions notified in the regulations governing wireless telegraphy.

And in view of the data recently communicated by the companies "A. E. G. Thomson Houston Iberica" and "Nacional de Telegrafia sin Hilos," the former saying that its resources permit the construction of 25 stations per month and that within one year 300 can be provided, whilst the latter give an assurance that they are able to supply wireless stations with the least possible delay, but not defining the duration of this delay.

It resulting from previous communications from this department that there are 57 stations already fitted and arranged for, and that there remain some 80 to be constructed or fitted.

It resulting, moreover, that this Administration deems a delay of eight months to be sufficient for the "Compañia Nacional de Telegrafia sin Hilos" to supply these 80 stations, that company being looked upon as a firm reputed in the business world as of good standing and with resources fully equal to those of the "A. E. G. Thomson Houston Iberica" and the delay of eight months being the double of that within which the latter undertake to fulfil those engagements.

His Majesty the King (whom God guard) in conformity with the information supplied by the Administration, and in agreement with his Privy Council, has thought it well to dispose that, beyond a delay of eight months from the date of publication of this Royal Order, the sailings of the ships mentioned in his Decree of February 20th of the present year shall be stopped if they fail to be fitted with complete wireless stations in accordance with the existing regulations, and that the Marine authorities in the provinces shall carefully communicate this decision to those who appear in their books as proprietors of the respective ships.

ROYAL DECREE OF
FEBRUARY 8TH, 1917.

H ART. 1.—All civil private wireless stations, whether they be transmitting and receiving stations, receiving alone, or assigned for the use of scientific or auxiliary meteorological observatories, are subject to the inspection of the Government, such inspection being carried out by the Home Office and the General Direction of Posts and Telegraphs.

The inspection shall be carried out by telegraph officials, and its object is to promote public order and interest, and protect the rights of the communication monopoly that belong to the State, in fulfilment of the present dispositions on the matter and in strict observance of the concession conditions.

In accordance with the rights granted by contract with the State to the "Compañia Nacional de Telegrafia sin Hilos," this company can also perform the inspection of the above-mentioned wireless stations at her own expense.

The appointment of inspectors by the company shall be countersigned by the Postmaster-General, and when in performance of their duty will be treated as public officials and be granted the same facilities in the exercise of their duties as those given to the Government inspectors stated in Arts. 3 and 4 of this Royal Decree.

The Home Office shall decide all questions which might arise in the carrying out of this private inspection.

ART. 2.—In addition to the inspection work which the Home Office or the Postmaster-General may at any moment judge convenient to carry out a constant inspection service shall be carried out in the said civil radiotelegraphic stations under the Spanish State authorities.

ART. 3.—To carry out the constant inspection service stated in the preceding article, an inspector for each station shall be appointed by the Postmaster-General, who shall superintend the work, and the station shall not be used even for scientific purposes, except under his personal supervision. The inspector shall adopt such measures as he thinks fit to prevent the station being used during his absence.

When the working of a station cannot be attended to by one official alone, the Postmaster-General may assign two or more inspectors, and distribute between them the work of the station as he may judge convenient.

ART. 4.—Access will be allowed to the inspector of the station at any time of the day or of the night without need of permission, request, or notice of any kind.

For this purpose the keys of the place or places in which the apparatus is installed shall be given to the inspector by the owner or licensee of the station, so that no obstacle or delay may prevent his entrance.

ART. 5.—A weekly report of the general working condition of the station, stating the nature of the service, the day, hour, and minutes when they were effected, and any observation the inspector may judge should be specially noted, should be sent by him to the Telegraph Direction.

Immediate notice shall also be given by the inspector to the General Telegraph Direction of any technical or legal anomaly observed in the working of the station, and the orders of the authority shall be transmitted, executed, or caused to be executed by the said inspector.

ART. 6.—All applications for license to install a radiotelegraphic station must comply with the following conditions, as well as with all others in force at the time:—

(1) The purpose for which the station is to be employed must be clearly expressed.

(2) A plan of the site where the station is to be installed, its communication with the public street or road, and the places where the apparatus are to be mounted in a 2 per cent. scale, and another plan with diagram of connections and details of aerial in a 10 per cent. scale, shall accompany the request for the licence.

(3) A detailed list of the apparatus specifying their nature, trade mark, and manufacture number (if any), must accompany the application.

(4) The name, age, address, and professional title (if in possession of one) of the operator or operators who will work the station must be granted.

The Home Office Minister can grant or refuse the concession of the license, and can also modify the technical conditions of the installation before or after the licence has been granted.

ART. 7.—No modification either of the installation or disposition of the station is allowed without authorisation of the Home Office Minister acting on information of the appropriate inspector.

All modifications should be reported to the General Telegraph Direction by the inspector of the station.

ART. 8.—Before a station is opened the proprietor or licensee will deposit a sum of 5,000 pesetas in the general safe of deposits at the disposal of the Postmaster-General, and set aside to cover the pecuniary obligations which the proprietor or licensee might incur.

This sum must be replaced should it diminish or disappear in making good the obligations for which it is set aside.

ART. 9.—The proprietor or licensee must pay all expenses incurred by the final inspection. These expenses comprise a sum which will be fixed by the Postmaster-General, and which must not exceed 2,000 pesetas per annum, to be given to the inspector in monthly payments as a reward for his services, and in payment of all office expenses.

Office accommodation should also be provided for the inspector of the "Compañía Nacional de Telegrafía sin Hilos," should there be one.

Should there be no telegraph office in the place where the station is installed, the proprietor or licensee must provide decent food and lodging for both the official and private inspectors, should there be any.

ART. 10.—The General Direction will classify as major or minor offences any infringements by the proprietor or licensee or any of their staff of this Royal Decree or any other standing orders in this regard.

In all cases the following will be considered as a major offence:—

(1) Not fulfilling the conditions of the licence.

(2) Any modification in the installation or arrangement of the station without due authorisation of the Home Office.

(3) Deliberate obstruction of the inspector with regard to free access to the station under his charge.

(4) The using of the station for any service without the presence of the inspector.

(5) Infringement of the terms of Art. 8 of the Royal Decree.

ART. 11.—Apart from other criminal or civil responsibilities involved in the offences enumerated in the preceding article, the following penalties will be exacted:—

(a) Fine of 100 to 500 pesetas for petty offences.

(b) Fine of 501 to 2,000 pesetas for serious offences, together with loss of the licence and apparatus. The station will be dismantled at the General Direction of Telegraph's will.

The working of the station may be immediately suspended by the inspector on his discovery of any of the offences enumerated in numbers 1, 2, 3 and 4 of the preceding articles.

ART. 12.—Apart from other criminal responsibilities binding upon the inspector, acts of commission or omission infringing this Royal Decree or any other standing regulations on the matter will be considered as serious offences, and will be punished in accordance with the rules and regulations of the Post and Telegraph Corporation. Should the inspector not belong to the said corporation (*i.e.*, hold the rank of private inspector), the offence will be punished with the fine of 100 to 2,000 pesetas and disability from continuing in his office, the "Compañía Nacional de Telegrafía sin Hilos" being responsible for the payment of the fine.

ART. 13.—Any illicit station discovered shall be immediately dismantled, the General Direction taking possession of all apparatus. The proprietor and any other persons who may be found guilty of installing or working such a station shall, apart from other criminal responsibilities to which they be liable, be punished with a fine of 2,000 to 5,000 pesetas.

The owner of the building, director of the establishment, society, or corporation in whose premises a clandestine station is installed, and who, as soon as it comes to his knowledge, does not report the fact immediately in the quickest possible way to the General Direction, will incur the same responsibilities.

ART. 14.—Trial for these offences shall be held in public.

An informer shall be entitled to half of the amount of the imposed fine.

ART. 15.—The use of radiotelegraphy granted to official centres for scientific purposes and worked by public officials is not subject to constant inspection, and is excused the deposit referred to in Article 8. The service will not be suspended, nor the apparatus confiscated, should any infringement be committed by the licensee or staff; but the persons guilty of the offence shall be subject to the criminal or civil responsibilities which may personally affect them. A report will be sent in by the Minister of the Home Office to the Minister under whose supervision the station is administered of the offences committed in order to assure the observance of this Royal Decree, and that these offences should be noted in the personal service records.

ART. 16.—The terms of the Royal Decree do not concern the "Compañía Nacional de Telegrafía sin Hilos" (except those which specifically affect this company), and the inspection of these stations will be subject to the conditions of the contract with the State.

ART. 17.—The authorisation for the working of radiotelegraphic stations granted with priority under the Royal Decree must be carried into effect. The General Direction of Telegraphs will immediately organise the constant inspection service for the stations not comprised in Articles 15 and 16.

A term of eight days is granted from the date of publication of this Royal Decree for all private authorised existent stations to send in to the General Direction the information referred to in numbers 2, 3, and 4, of Article 6, and also make the deposit ordered in Article 9. If the term expires before the fulfilment of these obligations, the station will be considered as illicit, and immediate proceedings taken under Article 13, unless the licensee shall present before the expiration of the fixed term a renunciation of his license to the Minister of the Home Office through the General Direction. He must as a preliminary thereto have dismantled the apparatus.

The same term of eight days is given to those in charge of existing radiotelegraphic stations to hand over to the General Direction the information asked for in numbers 2, 3, and 4 of Article 6. Should the term expire without the fulfilment of these conditions proceedings will be taken according to Article 15.

CONVENTION OF MADRID, DATED JUNE 17TH, 1918, AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919. CONCERNING WAVELENGTHS TO BE USED BY STATIONS UNDER SPANISH CONTROL.

I. The undersigned have held meetings of a semi-official character in the Ministry of State, Madrid, Spain, on June 12th, 13th, 14th and 15th, 1918, for the purpose of discussing the means for avoiding interference in communications by wireless

telegraphy and for the establishment of a programme which shall benefit mutually the radiotelegraph services of the various Governments represented.

2. Attached and below are three annexes marked (A), (B) and (C), in which are contained the agreements unanimously arrived at by all the representatives present.

Annexe (A) sets forth the agreements adopted.

Annexe (B) contains the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Spanish Army and Navy.

Annexe (C) includes the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Compania Nacional de Telegrafia sin Hilos and of the Ministry of State.

TABLE B AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Call Signs.	Name of Station.	Watching Wave. (Note 1)	Normal Transmitting Wave. (Note 2)	Other Waves used only in case of Interference. (Note 3)	General Watching Wave during (Note 1)	
					First Five minutes of the hour.	Last Ten minutes of the hour.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			MILITARY.			
EGA	Almeria ..	900	900	1200.1590.2100	600	—
EGB	Melilla ..	900	900	1200.1590.2100	600	1590†
EGC	Madrid ..	1500	2100	1500.2500.3750	—	—
EGD	Ceuta ..	1500	1590	900.1200.2100	600	1590†
EGE	Barcelona ..	900	900	1200.1590	600	1590†
EGF	Larrache ..	1200	1200	900.1590.2100	600	1590†
EGG	Valencia ..	900	900	1200.1590	600	1590†
EGH	Bilbao ..	900	900	1200.1590	600	1590†
EGI	Mahon ..	900	900	1200.1590	600	1590†
EGJ	Coruña ..	900	900	1200.1590	600	1590†
EGK	Tetuan ..	2100	2100	900.1200.1590	600	—
EGL	Cape Juby ..	900	900	1200.1590	600	—
EGM	Malaga ..	1500	1590	900.1200.2100	600	—
EGN	La Palma ..	900	900	1200.1590	600	—
			NAVAL.			
EBW	Le Ferrol ..	900	900	*1200.1590	600	450
EBX	Cartagena ..	900	1200	*1200.1590	600	450
EBY	San Fernando ..	900	1200	*900.1500.2100	600	450
EBZ	Madrid ..	—	—	—	—	—
CLZ	La Caraca ..	450	450	—	—	—
—	Large ships ..	900	900	*1200.1590	600	450
—	Small ships ..	900	450	900	600	450

NOTES.—(1) A station is always to be called on his watching wave (columns 3, 6 and 7).

(2) Normally the answer to the call and the signal to transmit should be made on the normal transmitting wave (column 4).

(3) In case of interference only, one of the waves indicated in column 5 may be used temporarily to avoid such interference.

(*) 1590 metre and 2100 metre wavelengths not to be used except when communicating with EGC, EGD, EGF and EGK.

(†) The watch on 1590 metres will not be kept except when ordered.

TABLE C AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Name of Station.	Call.	Watching Wave.	Transmitting Wave.	Wave to communicate with other Land and Ship Stations.	Remarks.
Aranjuez	EAA	—	3800	—	—
Barcelona	EAB	600	2350	—	—
(Ship Stations)					
Cadiz	EAC	600	2500	900	Begins Press at 2030 G.M.T.
(except when working with EAL and EAT)					
Finisterre	EAF	600	600	900	—
Melenara (Las Palmas)	EAL	600	2100	900	Begins Press at 0300 G.M.T.
(except when working with EAC and EAT)					
Soller	EA0	600	600	900	—
Cabo de Palos	EAP	600	600	900	—
Santander	EAS	600	600	900	—
Tenerife	EAT	600	2100	900	Begins Press at 0230 G.M.T.
(except when working with EAC and EAL)					
Vigo	EAV	600	2350	—	Closed temporarily.
Sta. Isabel de Fernando Po.					
Legación de Tánger ..	EAY	600	600	—	—
	AB	900	300	—	Calls EAC on 600 and transmits on 300

3. It is understood that all the agreements and arrangements are subject to the approval of the various Governments represented.

Capitan de Fragata,
Representing the Ministry of Marine.

Major R.M.L.I.
English Representative.

Naval Lieutenant,
French Representative.

Captain,
French Representative.

Corvette Captain,
Italian Representative.

Ensign U.S.I.,
Representative of U.S.A.

Director of the Official School of
Telegraphy,
Representing the Ministry of the Interior.

Commander of Engineers and of the
Army.
Representative of the Ministry for War.

Naval Lieutenant,
Representing the Ministry of State and of the Compania Nacional sin Hilos.

ANNEXE (A).

AGREEMENTS ADOPTED.

1. The Agreements of the International Radiotelegraph Convention of July 5th, 1912, will be strictly observed.

2. Always whenever possible, communication on a wave of 600 metres will be prohibited.

3. In accordance with the Convention, Spanish merchant ships shall continue to use the 600 metre wave when communicating with commercial coast stations and between themselves.

4. Although war vessels are entitled to use any length of wave whatever, it is agreed for mutual convenience that Spanish war vessels shall not communicate with naval and military stations or between themselves on 600 metres, but with the wavelengths specified in the Annexe (B).

5. It is agreed that inter-communication between Spanish coast stations, whether military, naval or commercial, shall not be made with a 600 metre wave, but with the wavelengths fixed and specified in the Annexes (B) and (C).

6. When a Spanish military, naval or commercial coast station desires to send a message to a Spanish coast station (commercial) which listens-in on a wave of 600 metres, the call will be with a wave of 600 metres and immediately afterwards they will give each other the conventional signals to change over to the 900 metre wave, and all subsequent communication will take place on that wave.

7. No operator of a coast station or ship station shall listen-in for more than one wavelength during the same period of time.

8. As far as possible, efforts shall be made that Spanish wireless telegraph stations do not interfere with the advices transmitted by coast stations at fixed hours or with the familiar calls for assistance (*llamadas de auxilio*).

The hours at which those advices are transmitted by stations on a wave of 600 metres are at present as follows:—

Station.	Call Signal.	Time (G.M.T.).
Casablanca ..	CNP	0245, 1045, 1845.
Gibraltar ..	BYW	0830, 2030.
Monsanto ..	CTV	0145, 0945, 1345, 2145.
Orán ..	FUO	0030, 1400.
Toulon ..	FUT	0930, 2040.

Wavelengths longer than 600 metres, on which the aforementioned advices are transmitted, are not used in the Spanish organisation given in the Annexes (B) and (C).

9. As far as practicable, the wavelengths which have been adopted by all the nations for their press messages will be respected and not interfered with.

No press message shall be transmitted with a 600 metre wave.

10. With the object of obviating interference by the North American, English and French stations with the Spanish stations, the wavelengths selected in the Annexes (B) and (C) will not be changed as far as possible.

11. No call signal or any other working signal shall be made more than three times in each call, and no call signal shall be repeated more than three times in a quarter of an hour. (International Radiotelegraph Convention of London, July 5th, 1912, Articles XXV and XXVI.)

12. All nations represented agree to take the necessary steps to obtain the most exact synchronisation possible at all their stations with a view to ensuring the efficiency of the organisation of wavelengths given in the Annexes (B) and (C), and so that the intermediate wavelengths of 300, 750, 1050, 1350, 1650, 2200, 2750, etc., shall remain free for the use of North American, English and French warships and stations.

13. All communications by wireless telegraphy shall be limited as far as possible.

14. Meetings of a semi-official character will be held in Madrid every six months (June 1st and December 1st) between the representatives of the United States, England, France and Spain, with the object of exchanging impressions regarding:—

- (a) Mutual organisation;
- (b) Means for eliminating interference;
- (c) Change of wavelengths;
- (d) Complaints.

ROYAL DECREE OF 18TH JANUARY, 1920.

On wireless telegraph and telephone installations for scientific purposes.

J Wireless telegraph, or telephone, sending and receiving, or only receiving, installations, for scientific purposes, are divided into two classes, viz.: (1) Permanent installations; (2) Provisional installations.

Permanent installations, either for research, or as a complement to meteorological observatories, or for any other purpose, will be subjected to the prescriptions of the Royal Decree dated 8th February, 1917.

Provisional installations, or those fitted with the sole object of scientific experimenting or study of any branch of wireless communication, will be permitted by the Home Minister at his discretion for a given time, under the following conditions:—

(1) Applications shall be accompanied by a full report of the experiments and researches which the applicant intends to carry out, showing the place or places destined for these experiments, with diagrams, if possible, of the aerial, transmitting or receiving apparatus and their category and importance.

(2) It must be stated for how long the license is required in order to carry out experiments and for how many hours per day it is intended to use it.

(3) The installation shall be inspected by an appointed official of the Spanish Telegraphs, and always under the control of the local Chief of the Telegraphs.

(4) As every license will be issued for a fixed time, at the expiration thereof the installation, comprising aerial and apparatus, shall be dismantled and the matter reported to the Director of Posts and Telegraphs.

(5) Employing the installation for other than experimental and research purposes will entail a fine upon the licensee of pesetas 500 to 2,000, in addition to the confiscation of apparatus and aerial, which shall become the property of the telegraph authorities.

(6) The licensee shall bear all expenses consequent upon the official inspection of this class of installation, in accordance with the stipulations of the Director of Posts and Telegraphs.

(7) Installations licensed for experiments in transmission shall be operated only at the hours and on the wavelength authorised by the Director of Posts and Telegraphs, in order to prevent interference with official and public services.

CANARY ISLANDS

The group of islands known under the above name consists of seven large and several small islands, whose combined area amounts to about 2,807 square miles and possesses a population of 520,516. It is commonly supposed that these islands constituted the Fortunate Islands of ancient history. They were forgotten, however, for several hundreds of years, but were re-discovered in 1334, when a French vessel was driven on to them by a storm.

They constitute at the present time a colony of Spain, and are administered by Spanish representatives.

CONTROL.

Wireless telegraphy in the islands is under the control of the *Compañía Nacional de Telegrafía sin Hilos*, which possesses two stations, one at Tenerife and the other at Las Palmas.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. B. Walsh	Chief Engineer	Teneriffe.
Mr. W. Sparkes	Chief Engineer	Las Palmas.

There are five operators at each station.

ORGANISATION.

At the end of 1911 the *Compañía Nacional de Telegrafía sin Hilos* took over the wireless stations of Tenerife and Las Palmas (at that time of 20 kW. power) from the old French company, and held trial programmes with the Poldhu station in England. As a result of this, each station was fitted with a Marconi 3 kW. set for ships. At the present time Tenerife has three valve receivers and one crystal receiver for ships, with a low frequency amplifier. It is anticipated that the Spanish Government will shortly install a direction-finding station, but at present the site has not yet been fixed. The Tenerife station sends out Press Bulletins in English and Spanish daily at 0330, also a meteorological report in code is transmitted twice per day to Carabanchel, a military station in Madrid. Under the jurisdiction of the Canary Islands falls the military radio station at Cabo Juby, on the African mainland. This is a 3 kW. Telefunken set.

ADMINISTRATION.

No special Laws and Regulations exist under which wireless telegraphy and telephony are administered, their working being regulated in accordance with the International Rules.

SPITZBERGEN

(SVALBARD)

(See also Map Section)

Including : Bear Island, North East Land, Prince Charles Foreland, Edge Island, Barents Land, King Karl's Land, Hope Island.

THIS group of barren islands, discovered by Barents in 1596, has formed the starting point for many expeditions in their endeavours to reach the North Pole. They lie in about 80° N. latitude, and between 10° and 30° E. longitude, and possess rich mineral resources. Their total area is 25,000 square miles.

CONTROL AND ORGANISATION.

Frequent attempts have been made in recent years to open up the archipelago commercially, and with that object several companies have been formed. These companies possess wireless stations which correspond with the wireless station at Green Harbour, owned and worked by the Norwegian Government.

The private stations are placed in Advent Bay (*Store Norske Spitsbergen Vulkompani*), Kingsbay (*Kinsbay Kulkompani*), Sveagruvan (*Sveakol*), Coalbay (*Anglo-Russian Crumant Co.*), Calypsobay and Marble Island (*Northern Exploration Co.*), and Capboheman (*Isefjord Coal Co.*). This last named station is not in use.

At Quade Hook is placed a meteorological wireless station which is owned by the Norwegian Meteorological Institute. No laws and regulations yet exist regarding the working of radiotelegraphy, but as the territory has been placed under the suzerainty of Norway their proximate promulgation is to be expected.

On Bear Island, situated about midway between Norway and Spitzbergen a 3 kW. Marconi Station has been erected. This land station is owned privately by the Bear Island Code Company in Tromsø, and is intended for communication direct with the Government wireless station at Ingøy (Norway).

STRAITS SETTLEMENTS

(See also Map Section)

Including : Christmas Island, Labuan, Cocos Islands.

THE Crown Colony of the Straits Settlements comprises Singapore, Penang, and Malacca. These settlements were transferred from the control of the Indian Government to that of the Secretary of State for the Colonies on April 1st, 1867. Labuan, the Cocos Islands and Christmas Island have since been annexed to the Colony.

The administration is vested in the hands of a Governor, aided by an Executive Council, legislation being under the direction of a Legislative Council, presided over by the Governor. The combined area of the colony is about 700 square miles, with a population of 800,000.

ORGANISATION.

Commercial wireless telegraph stations have been erected at Paya Lebar, Singapore, opened for traffic on October 8th, 1915, and Penaga, Penang, opened for traffic on February 21st, 1916. A 6-kW. C.W. transmitter for long distance ship-to-shore and shore-to-shore work was installed at Penang in the latter part of 1922. These installations are Government land stations under the control of the Postmaster-General.

The Brunei Government opened three small 60 watt C.W. stations in August, 1921, for inland communication at Brunei, Labuan and Temburong, thus placing Brunei in direct telegraphic communication with the outside world. Three more stations are available for erection when needed.

Wireless telegraphy is a State monopoly, but licenses to erect and work stations are issued to private companies or individuals.

There are no companies engaged in the manufacture of wireless apparatus, and no wireless societies, clubs, or publications. Arrangements have not yet been completed for the installation of aviation stations, and there are no wireless arrangements for the transmission of meteorological signals.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. C. Sells	Acting Postmaster-General ..	Singapore
Mr. F. H. Dupree	Engineer Operator	Singapore
Mr. S. R. Drayton	Engineer Operator	Penang
Mr. J. W. Machan	Assistant Engineer Operator ..	Singapore
Mr. L. R. Watts	Assistant Engineer Operator ..	Penang
Mr. P. H. F. George	Assistant Engineer Operator ..	Brunei

ADMINISTRATION.

The administration of wireless telegraphy is regulated by the Wireless Telegraph Ordinance of 1912, together with the regulations issued thereunder, which are printed in *extenso* below.

A—Ordinance No. 55, Part V, Wireless Telegraphy.

B—Regulations thereunder.

ORDINANCE No. 55. PART V.

WIRELESS TELEGRAPHY.

A 33. (1) In this Part the expression "wireless telegraphy" means any system of communication by telegraph, as defined in Part I, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(2) Nothing in this Part shall present any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

34. The Governor may, whenever he deems it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

35. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony, except under and in accordance with a license granted by the Governor.

(2) Every such license shall be in such form and for such period as the Governor in Council

determines, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor considers desirable in the public interest.

36. (1) Any person who establishes a wireless telegraph station or installs or works any apparatus for wireless telegraphy without a license shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term which may extend to twelve months, and in either case shall be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license.

(2) No proceedings shall be taken against any person under this Part, except with the previous sanction of the Public Prosecutor.

(3) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction, without a license, he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

37. (1) The Governor in Council may make regulations for

(a) Prescribing the form and manner in which applications for licenses under this Part are to be made;

(b) Prescribing the fees payable on the grant of any license;

(c) Regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) Prohibiting, except with the special or general permission of the Postmaster-General of the Colony, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Colony.

(e) Prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor sees fit to make and either in all cases or in such cases as are deemed desirable.

(2) No regulations made in respect of the matters described in clauses (c), (d) and (e) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

38. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted, subject to such special terms, conditions and restrictions as the Governor thinks fit, but shall not be subject to any rent or royalty.

39. Every omission or neglect to comply with, and every act done or attempted to be done contrary to this Part or any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against this Part, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

40. Any convictions, forfeitures and fines under this Part or any regulations made thereunder may be had and recovered before a District Court.

REGULATIONS.

B In exercise of the powers conferred by section 6 of the Wireless Telegraphy Ordinance, 1912, the Governor in Council is pleased to make the following regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraphy station lawfully established, installed, or worked in the Colony or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship whether British or foreign shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission of the Postmaster-General of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of the wireless telegraphy on board merchant ships whether British or foreign while in the waters of the Colony shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. The Regulations made on the 30th December, 1918, and published as Notification No. 5 in the *Gazette* of the 3rd January, 1919, are hereby cancelled.

E. C. H. WOLFF,

Clerk of Councils.

SUDAN (ANGLO-EGYPTIAN)

(See also Map Section)

THE immense territory known by the above name is situated immediately to the south of Egypt proper. It formed the locale of the war against the Khalifa in 1896-99, when the late Earl Kitchener overthrew this oppressive rebel and restored the country to a state of security and comparative peace. The area of this territory is 1,014,440 square miles, with a population of 3,400,000. By a convention between the Egyptian and British Governments, signed at Cairo on January 19th, 1899, the administration of the territory south of the 22nd parallel of N. latitude lies in the hands of a Governor-General appointed by Egypt with the assent of Great Britain. All ordinances, laws and regulations are made by the Governor-General in Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. Wynne	Director of Posts and Telegraphs	G.P.O., Khartoum
	Chief Engineer, P. & T.	G.P.O., Khartoum
Lieut. R. T. Williams, Royal Corps of Signals	Wireless Engineer	G.P.O., Khartoum
	Assistant Wireless Engineer	G.P.O., Khartoum
Staff-Sergeant G. Stevens, R.E. ..	Wireless Inspector	G.P.O., Khartoum
Staff-Sergeant W. Finding, R.E. ..	Wireless Inspector	G.P.O., Khartoum
Mr. H. A. Woolidge	Wireless Inspector	G.P.O., Khartoum

The wireless inspectors act as superintendents of groups of stations. The other personnel at the stations consist of European foreman engineers where possible in charge of groups of stations, native telegraphmasters and assistants, and native engine drivers and assistants.

ORGANISATION.

The first wireless installation in the Sudan was fitted at Port Sudan in the beginning of 1915, the first three inland stations, Nasser, Malakal, and Gambela, being fitted in the autumn of the same year. Other inland stations have since been added.

All stations have spark transmission, except the new valve station in process of construction at Khartoum, which is designed for a range of 1,500 miles. C.W. reception is at present installed at Malakal and Gambela, and will shortly be fitted at other stations. No arrangements are yet in force for communication with aircraft, or for the transmission of time, weather, hydrographic or press signals or for direction finding.

ADMINISTRATION.

The Regulations affecting Radiotelegraphy in the Sudan are carried out under an Ordinance issued by the Governor-General, and dated at Khartoum, June 4th, 1906. No special regulations have been issued in pursuance of the Ordinance of 1906, and the service is conducted under the Provisions of the International Radiotelegraph Convention, 1912, and the Regulations for its execution. No licenses for private wireless stations have hitherto been issued.

A—Wireless Telegraph Ordinance.

AN ORDINANCE FOR CONSTITUTING WIRELESS TELEGRAPHY A MONOPOLY OF GOVERNMENT. No. 2 of 1906.

A This Ordinance may be cited as "The Wireless Telegraph Ordinance, 1906."

No person shall install or make use of any apparatus for Wireless Telegraphy or transmit or receive messages by means of any such apparatus within the Sudan except the Department of Telegraphs or a duly authorised officer or official of the Sudan Government, unless such person is in possession of a special license in writing from the Governor-General.

SWAZILAND

(See also Map Section)

SITUATED at the south-eastern corner of the Transvaal, this country was originally placed under the administration of the South African Republic. It was, however, not incorporated with it. The British Government now exercises control over this territory. It is under the administration of the High Commissioner for South Africa, assisted by an Assistant Commissioners' Court, situate at Mbabane. It has an area of 6,678 square miles with a population of 133,565.

CONTROL AND ADMINISTRATION.

There is at present no wireless telegraphy or telephony in this country, and no legislation has been made concerning it.

SWEDEN

(See also Map Section)

THE territory of the Kingdom of Sweden includes the eastern and main part of the Scandinavian peninsula. In the extreme north and north-east Norway and Finland are her neighbours. The border on the Finnish frontier is the Torne Elf, a river running from north to south, and falling into the northern end of the Gulf of Bothnia. Norway lies on the west of Sweden; and the Kiel, a chain of highland plateaux and mountains, forms the natural boundary thereof. The Kattegat to the south-west and the Baltic in a southerly and easterly direction separate her from the European continent.

The length of the country is estimated to be 2,500 kilometres from 69° N. to 55° S. latitude, and the size 173,035 square miles. Population, 5,903,762.

Sweden is a constitutional monarchy, with Gustaf V. its reigning head. The Parliament consists of two chambers, and a Cabinet.

CONTROL.

Wireless telegraphy, except in so far as the Navy is concerned, has been placed in the hands of the Kungliga Telegrafstyrelsen, which is a body under the supervision of the Minister of Communication and of which the Radio Bureau forms a special department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. A. E. Orne	Minister of Communications	Stockholm
Mr. Sven Ludvig Herman Rydin	Director-General (Head of the Kungliga Telegrafstyrelsen)	Do.
Mr. S. Ljungqvist	Chief of Radio Bureau	Do.
Mr. A. S. Litström	Inspector of Wireless Installations	Do.
Mr. J. G. Holmström	Director of Radiotelegraphic Instruction	Do.

The first land station in Sweden was organised and owned by the Swedish Navy. At present six land stations belong to the Royal Swedish Telegraph Administration, two to the Swedish Navy, one to the State Railways, and two stations established on lightships to the Royal Pilot Administration.

No private companies, societies or individuals are permitted to work wireless telegraphy or erect stations without a concession from the Government.

ORGANISATION.

Wireless telegraphy was first employed by the Swedish Navy in 1902, and was at the same time installed on the fortresses near Vaxholm, off Stockholm, on the Baltic coast. Wireless rapidly developed in the Navy, and only a few years after the first trials every ship was equipped. In 1904 a ship

station and shore station were built in Karlskrona, but some years elapsed before wireless was introduced into the Mercantile Marine. In 1910 the s.s. *St. Paul*, of Gothenburg, was fitted with a Marconi installation, and soon afterwards there was much wireless activity amongst Swedish shipowners, so that by the end of 1921 some 200 ships of the Mercantile Marine were carrying wireless.

For ship and shore traffic there are stations at Boden, Göteborg, Hernösand, Karlskrona, Gottland, and at Vaxholm, near Stockholm. An important 50-kilowatt station has been erected near Karlsborg.

Wireless stations for aviation purposes have not yet been established. Meteorological and Press services are sent out, more especially for Swedish ships. Experiments with direction finding stations have been going forward for some time, and a station was opened at Vingå on November 15th last. It is controlled by Göteborg which latter is addressed for requests for position.

LIST OF INSTALLATIONS.

Land stations for public traffic to ships	6
Land stations for restricted public traffic.. .. .	5
Ship stations on Government vessels	49
Ship stations on privately owned vessels	205

ADMINISTRATION.

Wireless telegraphy and telephony are controlled by the Act of August 31st, 1907, the Royal Decree of May 13th, 1921, and the Statute 514 of December 23rd, 1915, concerning the equipment of vessels:—

A—Act of August 31st, 1907.

B—Royal Decree of May 13th, 1921.

C—Extract from Statute 514 of December 23rd, 1915.

D—Form of License.

E—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams, (see Norway).

ACT OF AUGUST, 31ST, 1907.

A CONCERNING THE ESTABLISHMENT AND WORKING OF INSTALLATIONS OF RADIOTELEGRAPHY AND RADIO-TELEPHONY.

1. Whosoever desires to establish in Sweden, on land or on board a vessel permanently moored in Swedish waters, an electric installation of radiotelegraphy or radiotelephony for public or private use must apply for an authorisation from the King.

2. The authorisation of the King must likewise be applied for, by any person or persons desiring to establish on board a Swedish vessel other than permanently moored, an installation of the kind referred to in Paragraph 1.

3. The authorisation granted by the King as prescribed in paragraphs 1 and 2, can only be granted for a certain period. In granting the authorisation, His Majesty prescribes under the reservation of private rights, the manner and conditions under which the installation may be established and worked.

4. Whosoever establishes or works, without the authorisation of the King or contrary to the provisions prescribed in the authorisation, an installation within the meaning of the present law, is liable to a fine of from 25 to 1,000 kronen if the penalty incurred by this contravention is not included in the Penal Code.

5. If an installation within the meaning of the present law has been established without the authorisation of the King, or contrary to the provisions prescribed simultaneously with

the authorisation, or if the authorisation has been revoked later by the King, it is the duty of the Governors of Provinces to take the necessary steps to prevent any use being made of the installation.

6. Every fine imposed under the present law reverts to the State. Fines not paid on account of the insolvency of the delinquent are expurgated by terms of imprisonment as prescribed in the Penal Code.

7. The provisions of this law do not apply to State installations.

8. All regulations and all dispositions concerning foreign vessels not permanently moored in Swedish waters, which may be considered necessary for the proper working in Sweden of installations within the meaning of the Act, are made by the King.

ROYAL DECREE OF MAY 13TH, 1921.

B ROYAL DECREE CONCERNING THE WORKING OF RADIOTELEGRAPHIC AND RADIOTELEPHONIC INSTALLATIONS ESTABLISHED ON BOARD FOREIGN VESSELS.

Given at the Palace of Stockholm on May 13th, 1921.

1, Gustave, by the grace of God, King of Sweden, of the Goths and Vendes, make known that on the representation which has been made to us, we hereby repeal the Decree of June 20th, 1913 (No. 125), concerning the working in the Kingdom of radiotelegraphic and radiotelephonic installations established on board foreign vessels, as well as the Decree of September 4th, 1916 (No. 375), concerning the conditions to be observed by those working in Swedish territorial waters, radiotelegraphic or radiotelephonic

installations established on board merchant vessels, which Decrees are replaced henceforward by the following dispositions, decreed on account of the clause inserted at Section 8 of the law of August 31st, 1907 (No. 94), relative to the establishment and working of radio-telegraphic and radiotelephonic installations.

1. Radiotelegraphic or radiotelephonic installations established on board foreign vessels, not stationary in the territorial waters of Sweden are called in the present decree radio installations on board foreign vessels.

2. (i) Radio installations on board foreign vessels must not be used in the vicinity of Swedish ports, without special authorisation to this effect, given by the "Director-General of Telegraphs" in conjunction with the "Chief of the Admiralty," and under reservation of a strict observance of the detailed regulations prescribed by the "Director-General of Telegraphs."

(ii) In the latitude of the territorial waters of Sweden, which are situated at a lesser distance than ten nautical miles of a Swedish coast station the radio installations on board foreign vessels must not be used except in case of distress or in order to communicate to the coast urgently.

(iii) The "Director-General of Telegraphs" must be able, after having arranged to this effect with the "Chief of the Admiralty," to suspend or restrict, except in case of distress, the use of radio installations on board of foreign vessels, even should it be proceeding by other latitudes of the territorial waters of Sweden than those stated in Section 2, para (ii).

3. The Director-General of Swedish Telegraphs has power to issue any necessary regulations concerning the putting out of use of radio installations on board of foreign vessels found in a latitude where conforming to the regulations of Section 2 it is forbidden to use such an installation.

4. The Director-General of Telegraphs will make known to navigators in the way that he judges best the regulations and rules decreed in Section 2, para. (iii), as well as those in Section 3 of the present law, once and for all time, for a certain time, or for some particular case. The said Director will also solicitate the Director of the Administration of Pilotage, the Director-General of Customs, the Departmental Authorities making inspections, and the services subordinate to them respectively, the strict observance of the laws and regulations decreed.

5. When a radio installation on board a foreign vessel is used in the territorial waters of Sweden it must, unless otherwise ordered, conform to the instructions given in the Radio Telegraphic Convention in force with the service rules attached thereto.

6. All infringements of the regulations of the present law or the regulations and orders decreed by the Director-General of Telegraphs in virtue of the same law will be punished by a fine of 25 to 1,000 crowns.

7. The offences shown in Section 6 will be dealt with by the agents of the Civil Administration.

For the competent jurisdiction in the matter of these offences the parties implicated must conform to the rules of Section 328 of the Maritime Code.

The fines imposed on the offenders in this matter will be taken by the Crown. The fines of which the amount would not be paid on account of the insolvency of the delinquent will be commuted in accordance with the penal code.

8. The regulations of Sections 6 and 7 herein described are not applicable to warships.

The present law will enter into force on June 1st, 1921.

In faith of which, etc.

Made at the Palace of Stockholm on May 13th, 1921.

(Signed)

(L.S.)

(Witnessed)

(Minister of Communications.)

EXTRACT FROM SWEDISH STATUTES, 1915.

No. 514 OF 23RD DECEMBER.

Fifth Chapter.

Equipment of Vessels.

I.—Wireless Telegraph Installation.

ART. 56.

Vessels which must be provided with wireless installation.—Vessels which are used for voyages between different countries or between a country and any of its colonies, possessions or protectorates, shall be equipped with wireless telegraph installation; provided, however—

That such installation shall not be required if the vessel has fewer than 50 persons on board or if although the number on board is 50 or over, this is exclusively due to the fact that the master, by reason of sickness among the crew or through other compelling, unforeseen circumstances, has been obliged to supplement the crew, or has saved persons in distress at sea, or by reason of obligation, according to law, has taken with him seamen or other persons;

And that the Board of Trade may, on application, grant exemption from the obligation of having such installation, if the Board, in view of the route or other circumstances concerning the voyage, finds that such installation is not necessary and if such application concerns:—

(a) Vessels which do not go out to a distance of more than 150 nautical miles from the nearest coast;

(b) Vessels which only in exceptional cases and incidentally have 50 persons or more on board for the reason that they take stowers or stowage labourers with them on a certain part of the voyage, and which on the one hand do not sail from one continent to another, and on the other hand are, during the said part of the voyage, between 30° northern and 30° southern latitude; or

(c) Sailing vessels which are of rather primitive construction and which it is practically impossible to equip with wireless installation.

ART. 57.

Concession and classes of vessels.—Concerning H.M.'s permission to carry out such installation as referred to in Art. 56, separate enactments have been issued.

In sanctioning such installation as aforesaid the King will fix the class in which the vessel shall be classified, in accordance with the nature of the attendance of the wireless telegraph station.

ART. 58.

Range of the installation.—The wireless installation shall be sufficiently powerful to be able to transmit in day-time, under normal conditions, signals which can be clearly distinguished at a distance of at least 100 nautical miles from the vessel.

ART. 59.

Spare installation.—Vessels which are to be equipped with wireless installation shall have a spare wireless plant. This shall be placed wholly and entirely in the upper parts of the vessel, as high up as possible, and all its parts shall be fitted up so as to be protected as much as possible.

The spare plant shall have a source of power which is exclusively intended for the spare plant, and which can be brought into action most speedily.

The source of power referred to in the second paragraph of this article shall be capable of acting for at least six hours with a minimum range of 80 nautical miles in the case of vessels, for which uninterrupted attendance of the wireless installation shall have been provided, and of 50 nautical miles in the case of any other vessel.

If the main installation meets the requirements of the first and second paragraphs hereof as regards the spare plant the spare installation shall not be required.

LICENSE.

D FORM OF LICENSE FOR SHIP STATIONS.

License.

Delivered in view of the opening of communication

of the radiotelegraphic station installed with the permission of the King on....(date)..... on board the Swedish vessel belonging to the Port of

The Royal Administration of Swedish Telegraphs certifies by these presents that as the result of the inspection instituted to this effect, the radiotelegraphic station above mentioned(system)..... fulfils the conditions cited in conformity with the regulations of the International Radio-Telegraphic Convention for the "Safety of Life at Sea" actually in force, relative to the station on board the..... class Stockholm.....(date).....192 .

The Director-General of Swedish Telegraphs.

Supplementary inspection made 19.. :
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SWITZERLAND

(See also Map Section)

THE Swiss Confederation is made up of the union of twenty-five separate political entities, or republics, organised into twenty-two cantons.

The area comprises 15,976 square miles, the population (according to the census of December 1st, 1920) numbers 3,880,320. The country extends from 45° 0' to 48° 0' north latitude, its longitude lying between 5° 0' and 11° 0' east of Greenwich. The length from north to south is 137 miles, the width from east to west 216 miles; the furthest points on its boundary are 223 miles apart.

Supreme authority is exercised by the Federal Assembly, which consists of two Councils. Both Chambers unite to elect the Federal Assembly, which wields the supreme authority and higher executive of the Confederation.

CONTROL.

Wireless telegraphy in Switzerland is controlled by the Department of Posts, Telegraphs and Railways, but there is no special branch of the department devoted thereto.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. R. Haab	Head of the Department of Posts, Telegraphs and Railways	Berne
Dr. R. Furrer	Director-General of Post, Telegraphs and Telephones ..	Berne
M. Hauser	Assistant to the Director-General	Berne
A. Muri	Chef de la Division Technique	Berne
Dr. M. Baur	Chef de la Section "Controle et Comptabilité"	Berne
E. Nussbaum	Inspector of Telegraphs	Berne

Wireless telegraphy is a State monopoly, based on the general Federal Law affecting telegraphs and telephones, of December 16th, 1907, of which we print below the apposite clauses.

Licenses are, however, granted for receiving stations only, available for a limited period, where these are to be used solely for the reception of time, weather signals, and general and technical instruction and scientific researches. We append the form of such contracts.

ORGANISATION.

In order to carry out a clause of the International Conference of October 25th, 1913, relative to an international time association, an Order in Council of September 14th, 1920, definitely revoked the prohibition, which had been in force during the war, and the installations have been returned to their owners, and starting with August 1st, 1916, the International Time Signal radiated from the Eiffel Tower is on working days telephonically transmitted by the Telegraph and Telephone Department at Berne to subscribers residing in Switzerland. (See Decree of the Federal Council dated July 21st, 1916.)

The Federal Council, on March 11th, 1921, granted a concession to Marconi's Wireless Telegraph Co. to establish and work an up-to-date wireless station with valve transmission of 25 kw. This station is worked by the "Marconi Radio Station, S.A.," constituted as a Swiss Société Anonyme for the purpose. It is situated near the village of Münchenbuchsee 7.35 km. north of Berne, at an altitude of 580 m. The geographical position is lat. 47° 0' 52" long. 7° 26' 37" E. of Greenwich. The station has been opened for international public service on April 12th, 1922, and works at high speed on a wavelength of 3,400.

A new law relating to the exploitation of radiotelegraphy and telephony was presented to the Federal Assembly on June 6th, 1921, and will probably become law on January 1st, 1923.

The Federal Postal, Telegraph and Railways Department has put forward a request concerning the law of concession, for the establishment and exploitation of radiotelegraphic and telephonic services for the Aerodromes of Genève and Lausanne and for the organisation of a "broadcasting service."

ADMINISTRATION.

The texts of the ruling Laws and Regulations reprinted here are:—

- A**—The Federal Telegraph and Telephone Law of 1907.
- B**—Extract from the Legal Resolutions governing the concession to Radiotelegraphic Receiving Stations.
- C**—License for Time, Weather and Experimental Receiving Stations.
- D**—Authorisation to hold a conference upon Radiotelegraphy with accompanying experiments demonstrating the reception of radiotelegraphic messages.
- E**—Federal Decree establishing Telephonic instead of Wireless Reception of International Time Signals.

FEDERAL LAW REGULATING THE ORGANISATION OF TELEGRAPHIC AND TELEPHONIC ADMINISTRATION.

(Dated December 16th, 1907.)

CHAPTER I.

A ART. 1.—The right to establish and exploit any form of electrical telegraph and telephone in Switzerland, or to issue licenses for any such apparatus is vested solely in the Confederation.

ART. 2.—Localities whose commercial, industrial, or political status warrants the establishment of telegraphic or telephonic stations shall contribute their just quota towards the expense of such establishment.

Subject to appeal to the Federal Council the Telegraph and Telephone Administration shall decide the matter of installation and extent of the facilities granted. The Federal Council shall specify the rules governing the subvention and guarantees to be given by communities and individuals.

ART. 3.—The right of usage of such facilities shall be common to all. No special privilege with regard to fees or priority of transmission or reception shall be granted to any.

Nevertheless, official communications of the Federal and Canton authorities, as well as messages concerning the Service of Posts, Telegraphs, Telephones, and Railways shall have priority over those of individuals.

ART. 4.—The Supreme Direction of Telegraphic and Telephonic Administration shall belong to the Federal Council.

All regulations affecting this branch of service shall be issued by the Federal Council, so far as the latter shall not have delegated its authority to the Postal, Telegraphic, and Railway Departments or to the responsible officials thereof.

ART. 5.—The Federal Council shall conduct all negotiations concerning general telegraphic and telephonic agreements abroad.

Ratification of such agreements must be made by the Federal Assembly.

The Federal Council may, however, finally ratify agreements concluded with bordering countries on the basis of the general conventions affecting telegraphy and telephony.

ART. 6.—The Federal Council shall appoint all telegraphic and telephonic officials and employees. The nomination of individual employees or fixed classes of employees may however be delegated to the Postal and Railway Department or to the Managing Director of Telegraphs and Telephones.

ART. 7.—The immediate superintendence of all the administration of telegraphs and telephones is delegated to the Postal and Railway Department which is moreover entrusted with the necessary executive power.

CHAPTER II.

This chapter contains Articles 8, 9, and 10, which enumerate the classes of chief officials.

CHAPTER III.

This chapter is concerned with the organisation of telegraphic and telephonic zones and the offices and officials to be established in connection therewith. It contains Articles 11 to 16 inclusive.

CHAPTER IV.

Herein are laid down (in Article 17) the classification and maximum salaries of chief officials.

CHAPTER V.

In this chapter we find Articles 18 to 22 embodying the general rules applying to the nomination basis of appointment and responsibilities of the various officials.

CHAPTER VI.

This chapter covers Articles 23 and 24 and concerns itself with offences and penalties. It also includes Article 25 enumerating the previous decrees abolished by this law and Article 26 the formal Direction of Issue.

Extract from the Legal Resolutions governing the concessions to Radiotelegraphic receiving stations.

1.—FEDERAL CONSTITUTION.

ART. 36.—AI. I.—Throughout the whole of Switzerland, the posts and telegraphs are under the control of the Federal Government.

AI. IV.—The inviolability of the secrecy of letters and telegrams is guaranteed.

2.—INTERNATIONAL TELEGRAPHIC CONVENTION OF ST. PETERSBURG (1875).

ART. 2.—They (the principal contracting parties) engage to make all necessary arrangements to ensure the secrecy of correspondence and their proper despatch.

3.—FEDERAL LAW OF JUNE 22ND, 1877, CONCERNING THE TELEGRAPHIC CORRESPONDENCE IN THE INTERIOR OF SWITZERLAND.

ART. 2.—The Federal administration accepts no responsibility whatever on the subject of telegraphic correspondence. On the contrary, it will take all necessary precautions to ensure and accelerate the service and to safeguard the secrecy of the correspondence.

4.—FEDERAL LAW RELATING TO TELEPHONES of the 27th June, 1889, with the alterations made to them by the Federal law of 7th December, 1894, and by the Federal order of 25th December, 1914.

ART. 21.—The granting of a concession does not include any kind of right in that which concerns the use of another's property, of that of the State, of communes, or of private indi-

viduals; the concessionaire must himself procure the authorisation necessary to it from the owners, and come to an agreement directly with them on the questions of an eventual indemnity.

ART. 22.—A concession is only accorded when its execution does not prejudice either the actual exploitation or the future development of the public telegraph and telephone services. These concessions may be revoked at any time without indemnity.

5.—FEDERAL LAW OF THE 16TH DECEMBER, 1907, RELATING TO THE ORGANISATION AND ADMINISTRATION OF TELEGRAPHS AND TELEPHONES.

ART. 1.—The right of establishing and of exploiting electric telegraphs and telephonic installations in Switzerland, or of granting concessions to this effect, belongs exclusively to the Confederation.

ART. 23.—In virtue of the rights of the telegraph and telephones, it is prohibited—

(a) To establish and exploit, by borrowing another's property, any installation, either telegraphic or telephonic, or any other communication with low current, without a concession having been granted to this effect by the competent federal authority.

(This resolution refers, it is true, to such installations of low current linked together by a conductor. In any case, and in virtue of Article 1—above-mentioned—of the Federal Law of the 15th of December, 1907, it applies by analogy to the radiotelegraphic installations, that the antennæ borrowed or not from the property of a third party.)

(b) To utilise any electric installation of low current for any other purpose than that set forth in the concession.

(c) To graft other wires or other apparatus on those of the federal administration without its consent.

ART. 24.—AI. I.—The violations of the rights of telegraphs and telephones are punished by a fine of from 1 to 50 francs. In the case of a repetition of this offence, the fine may amount to 2,000 francs.

SPECIAL RESOLUTIONS.

As to the concession for receiving stations for time signals and meteorological bulletins and experimental and trial stations.

1. The authorisation to establish a radiotelegraphic or radiotelephonic station for the receipt of time signals and meteorological bulletins, and for experiments and trials of a provisional character, is only accorded conventionally.

2.—The administration may, at any time, cancel a granted concession or cause to discontinue the use of a station by the application of suitable measure without having to pay any indemnity whatever or to make known its reason for such decision.

3. The administration reserves the right to decide whether any concession may be granted or not.

4. No authorised station may be transferred to a third party without the written consent of the Director-General of Telegraphs.

5. The concessionaire must conform to all rules which the authorities may lay down in matters concerning wireless telegraphy or telephony.

6. The granted installation must at all times and in all its parts be accessible to the representatives of the administration of telegraphs and telephones entrusted with the control.

7. The installation will serve only for the purpose specified in the concession. All other uses shall be considered as violation of the rights.

Such will be considered culpable of infraction of the rights as—

Whoever exchanges with transmission stations in Switzerland or abroad any correspondence takes place of a personal or private character.

Whoever takes notes, in whatever manner, of the correspondence collected by his station and destined for a third party, or whoever makes known to a third party the meaning or the existence of these communications.

Whoever communicates to a third party, either out of politeness or for financial gain, any messages having a public signification, and of which the receipt is authorised by the act of concession for the personal use of the concessionaire.

Whoever, without having been authorised by the Administration, transfers the conceded installation to any other place, or makes use of public demonstrative experiments, or for a commercial purpose, etc.

8. The use of registering receivers of all kinds is forbidden (Morse rapid, parlograph, syphon, recorder, ordinary Morse registrar, etc.).

9. The concessionaire must notify the administration of all modifications of whatever importance which may be introduced later into the conceded installation.

When it is a question of experimental and trial stations, the concessionaire just present a report on any modifications as have been introduced at least once a year.

The following, among others, are modifications which are considered important—

Each modification or displacement of the antennæ (an immediate notification indispensable), the substitution, in view of the improvement of the reception, of crystal or electrolytic detectors by the Andiaon system, or amplifiers; the increase in numbers of the stages of amplification; the introduction indirect in place of direct reception; the use of any other device, either by reaction or by means of a heterodyne, for the receipt of sustained waves; the modification of the station in view of extending the interval of wavelengths to be received, etc.

10. The establishment of aerial antennæ in the neighbourhood of installations of high current is forbidden.

11. When it concerns the establishment of antennæ borrowing public property, or situated in the neighbourhood of installations of low current belonging to the State (cross or parallel), the installation must be made by an expert, and in conformity with the orders of the Federal Council on the establishment of electrical installations of low current, and with the special orders issued by the administration of telegraphs and telephones.

12. The aerial antennæ must, if possible, be established out of the hearing of the other installations of low current.

13. The length of the wire used, including the vertical distance between the point of union of the horizontal surface and the terminal of the receiver, shall not as a rule exceed 70 metres when it concerns antennæ of one wire and 100 metres in the case of a horizontal surface of two or more wires.

14. The administration does not incur, by reason of the concession, any kind of responsibility whatever towards the concessionaire or any third parties.

15. The concessionaire is responsible to the administration of telegraphs and telephones for all damage which may be caused by the non-observation of the rules set forth in the present concession.

16. The concessionaire must pay the administration the following fees—

(a) A single fee of 5 francs for the examination of his petition and for the drawing up of the concession.

(b) An annual and indivisible tax of 10 francs concurrent with the civil year.

CONCESSION.

FOR RADIOTELEGRAPHIC RECEIVING STATION.

C In virtue of the legal resolutions relating to the subject (see Appendix) and on the basis of the application presented, it is accorded to

M in the canton of the concession for the installation and use of a radiotelegraphic receiving station with antennæ in the building.

The concession is subject to the rules and regulations which follow—

GENERAL RESOLUTIONS.

1. The authorisation of installation and of exploitation of this station is of a provisional nature, and it is only granted conventionally.

2. The present concession may be cancelled at any time and on whatever date without the Federal authorities being called upon to pay any indemnity, nor obliged to state their motives for so doing. In the case of removal the installation must be taken down at the expense of the concessionaire within the period of eight days to start from the period fixed for the expiration of the concession.

3. In special circumstances the Federal authority may, without paying indemnity, and for an unlimited period, confiscate the entire installation.

4. The conceded installation may not in any way impede the exploitation and the development of the telegraphic and telephonic network of the State and the railway companies.

5. The conceded installation must, at all times, and in all its parts, be accessible to the representatives of the Administration of telegraphs and telephones entrusted with the control.

6. The administration does not incur, in virtue of the concession, any kind of responsibility whatever towards the concessionaire or whomsoever it may be.

7. On the other hand, the concessionaire will be held responsible for all damage which may be caused to the Federal administration by the non-observance of the regulations of the present concession.

8. The grant of a concession does not carry with it any kind of rights or privileges in what concerns the property of another party, whether the State, of the communes, or of private individuals; the concessionaire must therefore himself solicit the required authorisation from the owners and come to an agreement with them on the subject of an eventual indemnity.

9. The concessionaire must conform to all the rules and regulations which the Federal authorities may issue in respect of radioelectric telegraphy and telephony.

RULES RELATING TO THE USE OF RECEIVING STATIONS.

10. The conceded station is registered as and can only be made use of for All other use will be held as a violation of the rights of the Confederation.

11. Such will be found culpable of infraction of the rights—

Whoever exchanges correspondence of a personal or private nature with transmission stations situated in Switzerland or abroad.

Whoever takes notes, in whatever manner, of correspondence collected by his station and destined for a third party, or whoever makes known to a third party the contents, the meaning, or the existence of these communications.

Whoever communicates to a third party, either gratuitously or for financial purposes, radioelectric messages of a public nature, and the reception of which is authorised for the personal use of the concessionaire by the act of concession.

Whoever, without being authorised by the administration of telegraphs and telephones, transfers elsewhere the conceded installation, or uses it for public demonstrative experiments or for commercial advertisement purposes, etc.

12. The use of registering receivers of all kinds is prohibited (Morse apparatus, parlographs, syphon recorder, etc.).

13. The concessionaire shall notify the administration of all modifications of any importance which may be introduced later into the conceded installation.

When it concerns experimental and trial stations, the concessionaire must present, at least once a year, a report on the modifications introduced.

The following, with others, are considered as modifications of some importance—

Each modification or displacement of the antennae (immediate notification indispensable), the substitution, in view of the improvement of the reception, of crystal or electrolytic detectors by the devices Audion, or by amplifiers, the augmentation of the number of the stages of amplification.

The introduction of indirect in the place and stead of the direct reception, the use of any other device, either by reaction or by means of heterodyne, for the reception of sustained waves; the modification of the station relating to the extension of the interval of the wavelengths to be received, etc.

14. The antennae

15. The concessionaire must pay the following fees to the Administration—

(a) A sole fee of 5 francs for the examination of the application and for the drawing up of the act of concession.

(b) An annual and indivisible tax of 10 francs concurrent with the civil year.

Berne, the 192 .

The General Director of Telegraphs.

The undersigned, after having become acquainted with the rules and regulations above enumerated, declare willing to accept and to conform to same.

The 192 .

D Authorisation to hold a conference upon radiotelegraphy, with accompanying experiments demonstrating the reception of radiotelegraphic messages.

Mr.
(Profession)
of
received, on the following conditions, the
authorisation of holding a conference of radio-

telegraphy with accompanying experiments demonstrating the receipt of radiotelegraphic messages.

The conference will take place
on the 192
at o'clock, in (address).
Entrance paying gratis. Strike out what is not required.

1. The demonstrator must make, at the opening of the conference, the following declaration to the audience—

Radiotelegraphy comes under the rights of the telegraphic system. The monopoly of the Confederation in telegraphic affairs is foreseen by Article 36 of the Federal Constitution, and by Article 1 of the Federal Laws of December 16th, 1907, on the organisation of the administration of telegraphs and telephones. Paragraph 1 of Article 36 of the Federal constitution is as follows: "In all Switzerland the posts and telegraphs are under the Federal jurisdiction." Paragraph 4 says: "The inviolability of the secrecy of letters and telegrams is guaranteed."

Article 1 of the Federal Law of the 16th December, 1907, stipulates: "The right of establishing and of exploiting electric telegraphs and telephonic installations in Switzerland, or of according concessions to this effect, belongs exclusively to the Confederation."

By Article 2 of the International Telegraphic Convention at St. Petersburg (1875), the principal contracting parties are engaged "to take all necessary precautions to ensure the secrecy of the correspondence and their proper dispatch."

The Article 2 of the Federal Laws concerning the telegraphic correspondence within the interior of the country reads as follows: "The Federal administrator accepts no responsibility regarding telegraphic correspondence."

On the other hand it will take all necessary measures to assure and accelerate the service and to safeguard the secrecy of the correspondence.

In the interest of the secrecy of radiotelegraphic correspondence, the conferences on radiotelegraphy accompanied by experiments showing the reception of radiotelegraphic messages ought to be announced to the competent authority. Thenceforward such conferences can only be held by authority of the Director-General of Telegraphs.

2. An official of the district administration of telegraphs concerned, or of the first or second-class telegraph office of the district, will attend the conference and assure himself that the reception of the radiotelegraphic messages is carried out within the prescribed limits, that is to say, within the scope of the regulations of the authority granted. This official will be exempt from payment of any entrance fee.

3. It is prohibited, both to the demonstrator and his assistants, to take note of the radiotelegraphic messages heard in the course of the conference, and to communicate their meaning to third parties.

4. The use of tape machines of any kind, including the so-called parlograph apparatus, is prohibited.

5. The use of megaphones for the demonstrative reception of radiotelegraphic messages is likewise prohibited on principle. Exceptions to this rule may be authorised in respect to the reception of messages of a public character, such as time signals, meteorological bulletins, and the articles of newspaper for the purposes of advertisement. The audience must be notified of the public character of these communications

and messages. In this case also nobody is authorised to take notes and to communicate to third parties the tenor of messages so received.

6. The authority given in respect to a conference accompanied by experiments demonstrating the reception of radiotelegraphic messages is only valid for a single sitting. Such authority, including the first, is subject to a tax of 10 francs when a charge for admission is made.

7. Only the receiving apparatus of a conceded station may be used for demonstrating the reception of radio telegraphic messages. The prescriptions of the concession granted for the said station are reserved.

Berne, the

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The Director-General of Telegraphs.

TELEPHONIC TIME SIGNAL SERVICE.
SECTION A.

E Decree of the Federal Council dated July 21st, 1916.

The Swiss Federal Council, acting on the suggestion of its Postal and Railway Department, and in view of the Federal decision of March 27th, 1914, decrees:

1. That the international radiotelegraphic time signal radiated daily at 10.56 and at 11 o'clock (H.E.C.) from the Paris Observatory by the Eiffel Tower Station, shall be—during working days—retransmitted telephonically by the Administration of Swiss Telegraphs and Telephones at Berne.

2. Any regular telephone subscriber may take up a subscription to the telephonic time signal, arranging therefor with his telephone exchange.

3. Subscriptions are monthly or annual, and are valid for the civil month or civil year.

The rates of subscription are:

(a) Fr.2.50 per month, or part of a month.

(b) Fr.25 per year.

For ten months at least they must be paid in advance.

4. Over and above the possibility of regular subscriptions, telephone subscribers may arrange to be supplied with odd time-service messages on such circuits as receive them. Each separate message will be charged for at the rate of 20 centimes, and this fee will be included, with ordinary conversation charges, in the monthly account.

5. The Administrator of Telegraphs and Telephones will accept no responsibility with regard to any irregular working of the Telephonic Time-Signal Service; nevertheless every endeavour will be made to assure and develop the service.

6. If any interruption in telephonic transmission of the time-signal last for more than seven consecutive days, without this arising from any fault on the part of the subscriber, the subscription fee will be refunded proportionately to the duration of the interruption.

7. Every effort shall be made to carry this edict into effect on and from the 1st August, 1916.

The Postal and Railway Department shall take steps to carry this out.

Dated Berne, 21st July, 1916.

SECTION B.

Method of Administration.

1. Every telephone subscriber who desires to subscribe to the Telephonic Time-Signal Service must address a written request to his telephone exchange showing exactly what kind of subscription he desires to take up (see Article 4 of this section, paragraphs (a) to (c)).

2. The telephone exchange which receives an application for such a subscription may, under this rule, accede to the application immediately.

On the reception of a first request for a subscription, the Telephone Exchange puts itself immediately in touch either with the Central Station through whose intermediary the time signal will be sent, or with its own local centre.

3. The originals of all applications for subscription must be sent to the Chief Office, through the intermediary of the local centres.

4. (a) The fees for annual subscriptions must be paid in advance for December, together with the half-yearly fees for the ordinary telephone service.

For periods of less than ten months, starting with the first day of the subscription and until the end of the year, the tax is collected on the basis of the tariff applicable to monthly subscriptions.

An annual subscription becomes automatically renewed from year to year, and may be cancelled at any time upon giving eight days' notice. If, however, it has not run for at least ten months, counting from the beginning of the year up to the date of cancellation, the rate of tax applicable is that of a monthly subscription.

(b) Fees for monthly subscriptions for a settled period (temporary subscriptions) are payable in advance, and for the whole duration of the subscription.

In default of advice to the contrary on the part of the subscriber, his subscription is considered as cancelled on the expiry of the agreed period.

(c) Monthly subscriptions of indeterminate duration are renewed automatically month by month. They may be cancelled at the end of a month by notice given at least eight days in advance; the subscription fees being payable monthly and in advance.

(d) Requests for reception of odd time-service messages are only granted in the case of lines of some importance, and on condition that they are made at latest by 10.50 a.m. Applicants are rung up at 10.55 a.m.

Applications are noted by entering the number of the subscriber on tickets specially prepared for this purpose. These tickets serve as the basis for the rendering of accounts.

When it has not been possible to attend to an application, because the subscriber's line was engaged his enquiry is charged as a local conversation. Fees for odd time-signal messages are charged for at the end of each month on the same invoice as conversation charges.

5. Subscription rates and charges made for odd time-signal messages come under subsection 2(c) of the accounts for messages, and must in consequence be entered, duly classified (see Article 4 of section (a) above) on Form No. 600 under "Other Receipts."

6. The commission allowed to exchange proprietors attached to central stations of Class III, and of intermediary stations, who have to co-operate in the telephonic time-service amounts to 25 per cent. on receipts. This commission is taken into consideration when the annual telephone accounts are adjusted.

Time-service communications in transit should be recorded in the same way as ordinary conversations in transit.

7. When the time-signal message is transmitted to an intermediary station linked up with a central station of Class III, the latter has only a right to a commission of 2 cents per communication in transit, and the commission of 25 per cent. on the message is allotted to the proprietor of the intermediary station.

SYRIA

(See also Map Section)

BY the Treaty of Peace with Turkey (August 10th, 1920), Syria became an independent State, at present under a High Commissioner. It is situated on the Mediterranean, and bordered by Palestine in the south, Mesopotamia on the east, and the Baghdad railway between Chobaubeg and Nisibin.

The area of the state is about 60,000 square miles with a population of somewhat less than 3,000,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any information relating to wireless in Syria.

TANGANYIKA TERRITORY

Late GERMAN EAST AFRICA.

(See also Map Section)

THE territory of the late German East Africa, conquered in 1918, was divided between the British and Belgians. The British area became Tanganyika territory. It is administered by a Governor, assisted by an Executive Council.

The area of the territory is about 365,000 square miles, with a population of 4,002,447.

CONTROL AND ORGANISATION.

There are at present no wireless stations in the territory, nor has any legislation be formulated for its control.

TIMOR (PORTUGUESE)

(See also Map Section)

SITUATED in the Malay Archipelago, Portuguese Timor consists of the Seastern portion of the island of that name. The island was, in 1859, divided between Portugal and Holland. The population is 377,815.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Timor. A reference however, is to be found under Portugal.

TOGOLAND

(See also Map Section)

Including : British Togoland, French Togoland.

SITUATED between the Gold Coast Colony on the west, and French Dahomey on the east, Togoland was formerly a German colony. On its surrender it was divided between Great Britain and France.

The area of British Togoland is 12,600 square miles, and is provisionally, for administrative purposes, attached to the Gold Coast Colony.

French Togoland has an area of 21,200 square miles, and the combined population is estimated at 1,032,125.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Togoland. References are, however, to be found under Gold Coast Colony and France and Algeria.

TONGA ISLANDS

(See under PACIFIC ISLANDS.)

TRIPOLITANA AND CYRENAICA

(See also Map Section)

KNO**W**N generally as Italian Libia, these Italian possessions lie along the coast of Africa between Tunis in the west, and Egypt on the east. For administrative purposes this territory is divided up into the two independent districts of Tripolitana and Cyrenaica, each under a Governor.

The combined area of the territory is estimated at 406,000 square miles with a population of about 1,000,000.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Italian Libia. A reference, however, is to be found under Italy.

TUNIS (AFRIKIYA)

(See also Map Section)

TUNIS is a protectorate of France, under a Resident General, with Sidi Mohamed En Naccur Bacha Bey at the head of the State. It is situated on the Mediterranean, and bounded on the west by the Algerian province of Constantine, and on the south by the Sahara and Libya.

Its area is about 50,000 square miles and has a population of 156,115.

CONTROL AND ORGANISATION.

Up to the time of going to press we have been unable to obtain any special information relating to wireless in Tunis. A reference however, is to be found under France and Algeria.

TURKEY

(See also Map Section)

THE Turkish Empire has suffered a succession of rapid changes during the past few years, and stable conditions are not even yet sufficiently established to give a concise demarkation of the limits of its territory.

After the war of 1914-1919 Mohammed VI became the reigning Sultan, but the Turkish Nationalist movement has since again changed both the map and the Government.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Réfik Halid ..	Director-General of Posts, Telegraphs and Telephones	Constantinople

ORGANISATION.

Up to the time of going to press we have not been able to obtain any information relative to the organisation and administration of wireless in Turkey.

UGANDA PROTECTORATE

(See also Map Section)

UGANDA came under British dominion in 1890, and a portion of the territories was for a time administered by the Imperial British East African Company. The northern boundary is limited by the Sudan, the eastern by Kenya Colony, the western by the Belgian Congo, and the southern by Tanganyikan territory. The population is estimated at 3,071,608, and the area of the Protectorate 110,300 square miles.

The administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and Legislative Council.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. W. G. Tucker ..	Telegraph Engineer	Entebbe
Mr. R. Rabson ..	Assistant Telegraph Engineer	Do.

ADMINISTRATION.

Wireless telegraphy is administered under the following Ordinance :—

ORDINANCE.

1. This Ordinance may be cited as "The Wireless Telegraphs Ordinance, 1908."

2. No person shall use or establish any apparatus or installation for the purpose of operating wireless telegraphs without a license from the Governor.

Any person contravening the terms of this section shall be liable on conviction to a fine not exceeding Rs. 1,500 or imprisonment

of either kind for a term not exceeding twelve months, and any apparatus or installation in respect of which an offence under this section is committed may be forfeited and sold or disposed of as the Governor may direct.

3. It shall be lawful for the Governor from time to time by rules to prescribe the terms and conditions upon which licenses to use or establish apparatus or installations for the purpose of operating wireless telegraphs may be granted.

UNITED STATES OF AMERICA

(See also Map Section)

Including : The States of Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York State, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the Territory of Alaska.

THE declaration of independence of the States of the American Union was adopted by Congress. July 4th, 1776. The Constitution of September 17th, 1787, lays down the basis of government under which (modified by amendments in 1787; 1791, 1798, 1804, 1865, 1868, 1870, 1913, 1919 and 1920) this great and powerful Republic is now governed.

The Union comprises 48 STATES, each of which is provided with a Legislature of two House, a Governor at the head of the Executive and a judicial system. The district of Columbia (D.C.) is the seat of the Federal Government, and was provided by the State of Maryland for this purpose in 1791. It is co-extensive with the City of Washington, and embraces an area of 60 miles. The TERRITORIES of Alaska and Hawaii are governed by local Legislatures, whose Acts may be modified or annulled by Congress. The grand total of the superficies governed under the U.S.A. Constitution amounts to 3,574,658 square miles, with a population of 105,710,620.

N.B.—There are, moreover, DEPENDENCIES administered by the U.S.A. Government. Their rule is undertaken by a Governor and staff appointed by the President. Porto Rico and the Philippines belong to this division, although provided with Representative Government. Guam, in the Marianne Archipelago (Pacific Ocean), and the Samoan Islands are pure Dependencies administered by the U.S. Navy Department. Wireless in all these instances is controlled by the Navy Department in war time, but in peace time the radio stations of Porto Rico, Hawaii and Alaska are under the jurisdiction of the Department of Commerce, and all commercial transmitting radio stations operated in these dependencies must be licensed by this Department, and the operators of such stations must also be licensed.

The "CANAL ZONE" on the Isthmus of Panama ranks as a Dependency, but it has been judged best to print the wireless particulars relating thereto separately under the heading "Panama—Canal Zone."

CONTROL.

The Congress of the United States has delegated to the Department of Commerce the duty of the enforcement of the Wireless Communication Laws and the International Radio-telegraph Convention, and the work is handled through the Bureau of Navigation, Washington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Officials.	Title.	Address.
<i>Navy—</i> Capt. Henry J. Ziegemeier	Director of Naval Communications ..	Washington
<i>Army—</i> Maj.-Gen. Sir G. O. Squier, K.C.M.G ..	Chief Signal Officer	Washington
<i>Commerce—</i> Mr. Herbert Hoover	Secretary of Commerce	Washington
Mr. C. H. Huston	Assistant Secretary of Commerce ..	Washington
Mr. D. B. Carson	Commissioner of Navigation	Washington
Mr. A. J. Tyter	Deputy Commissioner of Navigation ..	Washington
Mr. W. D. Terrell	Chief Radio Inspector	Washington

There are, in addition, twenty-one inspectors and assistant inspectors, stationed at various districts established by the Bureau of Navigation.

ORGANISATION.

In September and October, 1899, Senatore (then Mr.) Marconi installed a radio station for the purpose of reporting the International yacht races between the yachts *Shamrock* and *Columbia*. The *New York Herald* of October 1st, 1899, tells how wireless was used for sending bulletins from the steamships *Ponce* and *Grande Duchesse*, which followed the contending yachts.

According to the most reliable information obtainable, the first regularly operated radio stations in the United States were at Siasconset (Nantucket), Mass., and on Nantucket Shoals Lightship No. 66, work on which was started early in the summer of 1901. These stations were not experimental, or demonstrational, or temporary stations, but were erected for the particular purpose of providing for the regular daily transmission of ship news, and for regular communication and exchange of messages with vessels equipped with similar apparatus. They were owned and operated by the *New York Herald*, and were equipped with Marconi apparatus purchased from, and installed by, the English Marconi Company.

The *New York Herald* of August 17th, 1901, contained an account of how the first radiotelegraphic station at Siasconset got into communication by wireless with the Nantucket Shoals Lightship. The latter, on August 16th, received from the s.s. *Lucania*, of the Cunard Line, at a distance of 72 miles, the first connected wireless message ever radiated to the United States from an approaching vessel. That message ran, "All well on board."

In 1899 (the same year as that of the first wirelessly reported yacht races) the matter of establishing radio services in the TERRITORY of HAWAII was receiving official attention. It was not until March 1st, 1901, however, that radio stations on the island were opened for business, the apparatus being supplied with power by Marconi induction coils. On October 15th, 1908, a 10-kw. station was erected at Kahuku Point, in Oahu (Hawaii) and at that time this was probably the most powerful station on the Pacific. Uninterrupted night communication was established with the wireless station on Telegraph Hill, San Francisco, California, a distance of 2,100 miles. This constituted the first direct radio communication between Hawaii and the U.S.A. On April 1st, 1915, a wireless service was established between the station at Wahiawa, Oahu (Hawaii), and the United States Naval Station at Tuluila, Samoa (2,400 miles distant). A composite system of equipment was used, with a transformer input of 6-kw., and a reliable nightly service has been maintained ever since.

In the TERRITORY of ALASKA radio communication takes the place of wired telegraph and telephone services. The large fish-canning companies rely almost exclusively upon their radio installations for communication between their canning plants, and for the maintenance of touch with their vessels engaged in this industry. Static interference (or atmospherics) is practically unknown there.

The number of wireless stations (excluding amateur installations) licensed in the United States at June 30th, 1922, totalled 16,704, of which 7 are in Hawaii, 52 in Alaska, 21 in the Philippines, and 2,773 are ship stations. On June 30th, 1922, there were 382 stations broadcasting music, concerts, market reports and similar matter.

At June 30th, 1922, the *Government* shore wireless stations numbered 135, of which 157 (including D.F. stations), are in continental United States, 27 in Alaska, 9 in the Philippines, 3 in the Canal Zone, 3 in Panama, 2 in Hawaii, and 1 each in Puerto Rico, Guam, Samoa, China, Haiti, Virgin Islands, and Dominican Republic. The *Government* ship stations total 1,192.

Considerable meteorological services are given under the control of the Department of Agriculture, Weather Bureau, in co-operation with the Office of Communication of the Navy Department. An extensive Hydrographic and Time service is dealt with by the Naval Department.

There are 15 Air Mail Radio Stations used in connection with the mail services of the Post Office Department.

In practically every city of any size in the United States there are one or more radio clubs, composed of men interested in radiotelegraphy from a scientific standpoint, practical radio men, and amateur radio experimenters.* The most important of these clubs is the Institute of Radio Engineers (particulars regarding which may be obtained from the Year-Book published in New York by the Institute).

ADMINISTRATION.

In 1910 an effort to regulate radio communication in the United States was made, when a Bill was prepared and passed by the Senate. It was not reached on the House of Representatives calendar, and therefore did not become effective.

The first Act requiring radio apparatus on certain passenger-carrying vessels was approved June 24th, 1910. Under this Act the Secretary of Commerce and Labour organised on July 1st, 1911, the radio service, composed of three inspectors, with headquarters at New York, N.Y., Baltimore, Md., and San Francisco, Cal.

The second Act, approved July 23rd, 1912, amended the above Act and is printed below.

* For a list of the principal Clubs and Societies see Amateur section of this volume.

The Act to regulate radio communication was approved August 13th, 1912. Under this Act transmitting stations and radio operators are licensed by the Secretary of Commerce. Transmitting stations are inspected to ascertain whether they comply with the requirements of the law. Radio operators are examined in order to determine their qualifications.

In addition to the above-mentioned Acts, the Department also enforces the London International Radiotelegraphic Convention rules of 1912, to which the United States is a party.

On March 4th, 1913, the Act abolishing the Department of Commerce and Labour and creating the Department of Commerce and the Department of Labour became effective. The enforcement of the radio laws was placed under the jurisdiction of the Secretary of Commerce.

The items published in the following pages are :—

- A—Act of July 23rd, 1912.
- B—Act of August 13th, 1912.
- C—Regulations, 1912.
- D—Regulations governing Ship and Land Radio Stations (as amended April 15th and May 1st, 1920).
- E—Regulations governing Radio Operators.
- F—General Information.
- G—Certificate of Radio Inspection.
- H—Master's Certificate of Radio Apparatus.
- I—Radio Declaration, Form 753a.
- J—Master's Certificate, Clearance Form 753b.
- K—License for General Public Service Coast Radio Station.
- L—License for Ship Radio Station.
- M—License for Land Radio Station.
- N—License for Amateur Radio Station.
- O—License to Radio Operator, Commercial Extra First Grade.
- P—License to Radio Operator, Commercial Grade.
- Q—License to Radio Operator, Amateur First Grade.
- R—License to Radio Operator, Amateur Second Grade.
- S—Notice to Berne Bureau.
- T—Act concerning International Communication.
- U—United States Radio Compass Stations.
- V—Public Resolution No. 48, dated June 5th, 1920.

A An Act approved July 23rd, 1912, amending section 1 of an Act entitled "An Act to require apparatus and operators for radio communication on certain ocean steamers," approved June 24th, 1910.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

"SEC. 1. That from and after October first, nineteen hundred and twelve, it shall be unlawful for any steamer of the United States or of any foreign country navigating the ocean or the Great Lakes and licensed to carry, or carrying, fifty or more persons, including passengers or crew or both, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with an efficient apparatus for radio communication, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night. An auxiliary power supply, independent of the vessel's main electric power plant, must be provided which will enable the sending set for at least four hours to send messages over a distance of at least one hundred miles, day or night, and efficient

communication between the operator in the radio room and the bridge shall be maintained at all times.

"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.

"That the provisions of this section shall not apply to steamers plying between ports, or places, less than two hundred miles apart."

SEC. 2. That this Act, so far as it relates to the Great Lakes, shall take effect on and after April first, nineteen hundred and thirteen, and so far as it relates to ocean cargo steamers shall take effect on and after July first, nineteen hundred and thirteen: *Provided*, That on cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log

* The amended Act applies to vessels licensed to carry, as well as those actually carrying, 50 or more persons, etc.

as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life.

The remaining sections of the Act of June 24th, 1910, which are unchanged, read as follows:—

SEC. 2. That for the purpose of this Act apparatus for radio communication shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange, as far as may be physically practicable, to be determined by the master of the vessel, messages with shore or ship stations using other systems of radio communication.

SEC. 3. That the master or other person being in charge of any such vessel which leaves or attempts to leave any port of the United States in violation of any of the provisions of this Act shall, upon conviction, be fined in a sum not more than five thousand dollars, and any such fine shall be a lien upon such vessel, and such vessel may be libelled thereto in any district court of the United States within the jurisdiction of which such vessel shall arrive or depart, and the leaving or attempting to leave each and every port of the United States shall constitute a separate offence.

SEC. 4. That the Secretary of Commerce shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of the Government.

B AN ACT TO REGULATE RADIO COMMUNICATION.

APPROVED AUGUST 13TH, 1912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a license, revocable for cause, in that behalf granted by the Secretary of Commerce upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: *Provided*, That the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a license shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a

fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

SEC. 2.—That every such license shall be in such form as the Secretary of Commerce shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the license is granted; that every such license shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such license shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such license shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as aforesaid be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said license for a period to be fixed by the Secretary of Commerce not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court for each and every such offence: *Provided*, That in case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the radio ship Act of June 24th, 1910.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus

is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce may grant special temporary licenses to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours, and under such conditions as will ensure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

Normal Wavelength.

C 1. Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service, shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Convention in force: *Provided*, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservation made by regulations first and second to accord with any international agreement to which the United States is a party.

Other Wavelengths.

2. In addition to the normal sending wavelength all stations, except as provided herein after in these regulations, may use other sending wavelengths: *Provided*, That they do not exceed 600 metres or that they do exceed 1,600 metres: *Provided further*, That the character of the waves emitted conforms to the requirements of regulations 3 and 4 following.

Use of a "Pure Wave."

3. At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemeter, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

Use of a "Sharp Wave."

4. At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

Use of "Standard Distress Wave."

5. Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force, except on vessels of small tonnage unable to have plants insuring that wavelength.

Signal of Distress.

6. The distress call used shall be the international signal of distress • • • — — • • •

Use of "Broad Interfering Wave" for Distress Signals.

7. When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

Distance Requirement for Distress Signals.

8. Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

"Right of Way" for Distress Signals.

9. All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

Reduced Power for Ships near a Government Station.

10. No station on shipboard when within fifteen nautical miles of a naval or military station shall use a transformer input exceeding 1 kw., nor, when within five nautical miles of such a station, a transformer input exceeding $\frac{1}{2}$ kw., except for sending signals of distress, or signals or radiograms relating thereto.

Intercommunication.

11. Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station, during the hours it is in operation, to listen-in at intervals of not less than fifteen minutes, and for a period not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

Division of Time.

12. At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour,

local standard time. The Secretary of Commerce may, on the recommendation of the department concerned, designate the station or stations which may be required to observe this division of time.

Government Stations to Observe Division of Time.

13. The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

Use of Unnecessary Power.

14. In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

General Restrictions on Private Stations.

15. No private or commercial station not engaged in the transaction of bona fide commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding 1 kw., except by special authority of the Secretary of Commerce contained in the license of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

Special Restrictions in the Vicinities of Government Stations.

16. No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding $\frac{1}{2}$ kw.

Ship Stations to Communicate with Nearest Shore Stations.

17. In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

Limitations for Future Installations in Vicinities of Government Stations.

18. No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations, to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California;

and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin Convention of 1906, and future International Conventions or treaties to which the United States may be a party, at each of the stations above referred to, and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin Convention of 1906 and future International Conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

Secrecy of Messages.

19. No person or persons engaged in or having knowledge of the operation of any station or stations, shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed or their authorized agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punished by a fine of not more than two hundred and fifty dollars or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the court.

Penalties.

For violation of any of these regulations, subject to which a license under sections 1 and 2 of this Act may be issued, the owner of the apparatus shall be liable to a penalty of one hundred dollars, which may be reduced or remitted by the Secretary of Commerce and for repeated violations of any of such regulations the license may be revoked.

For violation of any of these regulations, except as provided in regulation 19, subject to which a license under section 3 of this Act may be issued, the operator shall be subject to a penalty of twenty-five dollars, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any such regulations, the license shall be suspended or revoked.

SEC. 5.—That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanor, and upon conviction thereof the owner or operator,

or both, shall be punishable by a fine of not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio-communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit, or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than two thousand five hundred dollars or imprisonment for not more than five years, or both, in the discretion of the court for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than one thousand dollars or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

SEC. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act, and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this Act shall apply to apparatus for radio communication on any foreign ship.

SEC. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

SEC. 10.—That this Act shall not apply to the Philippine Islands.

SEC. 11.—That this Act shall take effect and be in force on and after four months from its passage.

D REGULATIONS GOVERNING SHIP AND LAND RADIO STATIONS.

SHIP STATIONS.

1. On vessels coming under the Ship Acts, an emergency power supply, independent of the vessel's main electric power plant, must be provided which will enable radio messages to be sent for at least four hours over a distance of at least 100 miles day or night. The emergency power supply and equipment should be located and installed in such manner as to afford maximum protection against accident.

2. The radio transmitting apparatus operated from the emergency power supply, should be capable of functioning within two minutes after unexpected notice to the operator.

3. The complete equipment must be maintained in an efficient condition at sea.

4. The complete emergency equipment should be tested before each sailing and daily at sea by the operator or an inspector and a note of its performance entered in the radio log.

5. Radio inspectors or other duly authorised officers of the Government will occasionally call for test messages to be sent by means of the emergency apparatus, while the vessel is at sea.

6. An "induction coil" connected to "plain aerial" is not recommended as emergency apparatus on account of the high voltages produced which frequently damage the antenna insulation and on account of "vibrator troubles."

7. A motor generator or rotary converter operated by storage battery is probably the most satisfactory means available at present of energising the transmitting apparatus.

8. Any auxiliary engine for wireless purposes must operate on a fuel which will fulfil the requirements of Rule XI, section 5, of the General Rules and Regulations of the Steamboat Inspection Service, reading as follows:

None of the inflammable articles specified in section 4472, Revised Statutes, or oil that will not stand a fire test of 300° F. shall be used as stores on any pleasure steamer or steamer carrying passengers except that vessels not carrying passengers for hire may transport gasoline or any of the products of petroleum for use as a source of motive power for motor boats or launches of such vessels (Sec. 4472, R.S.)

9. Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

10. One extra pair of head telephones, extra cords, and extra detectors must always be kept on hand.

11. A storage battery voltmeter, hydrometer, a supply of electrolyte, and distilled water should be part of the regular equipment, but are not prescribed in terms by statute. The absence of these and similar inexpensive emergency articles will be brought to the attention of the master and of the company installing the apparatus by the radio inspector, in writing, and if after a reasonable interval they have not been supplied, the inspector will communicate the fact to the Commissioner of Navigation.

12. The vessel's electric power for the operation of the main equipment shall, at all times while the steamer is under way, be available for the radio operator's use. On steamers where the dynamo is not run continuously there should be an efficient means of communication between the radio room and the dynamo room, in order that the radio operator may signal for power, as the law provides that he may not leave his post of duty.

13. Efficient communication between the radio room and the bridge must be maintained. A speaking tube or telephone will comply with this requirement. A bell and messenger service will not be acceptable unless there are special conditions justifying this equipment. The speaking tube or telephone must terminate in the radioroom and on the bridge, or in the chart room if readily accessible from the bridge. If the radio room is adjacent to or accessible from the bridge so that orders may be transferred direct, no means of communication will be required. Any arrangement calling for the services of a third person to transmit the messages will not be satisfactory. The radio inspectors will notify the ship authorities whether the means of communication provided is satisfactory at the time of inspection.

14. On vessels of the United States it is the statutory duty of the master to see that one operator is on duty at all times. The radio service of the ship is under the supreme authority of the master.

15. Masters should require operators on duty to communicate with the officer on the bridge every half-hour.

16. Operators must make entries on the radio log *every fifteen minutes*, as evidence that a continuous watch is being maintained. The entries must, if possible, consist of the call letters of other stations communicating and a few words of the intercepted messages.

17. When vessels are in port the key to the radio room must at all times be on board in charge of the proper officer and the radio equipment shall be in such condition as to facilitate Government inspection.

CLASSIFICATION OF SHIP STATIONS AND GRADES OF OPERATORS REQUIRED.

18. First Class: Vessels having a continuous service. There shall be placed in the first-class vessels which are intended to carry twenty-five or more passengers:

(1) If they have an average speed in service of fifteen knots or more.

(2) If they have average speed in service of more than thirteen knots, but only subject to the two-fold condition that they have on board 200 persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports.

19. Second Class: Vessels having a continuous *watch* but a *service* of limited duration. Other vessels placed in the second-class *must*, during navigation, maintain a continuous *watch* for at least seven hours a day, and a *watch* of ten minutes at the beginning of every other hour.

20. Third Class: Vessels which have no fixed periods of service. All vessels which are placed neither in the first nor in the second-class shall be placed in the third-class.

21. *Service* may be defined as preparedness to transmit and receive radio messages or signals at the rate of at least twenty words per minute.

22. *Watch* may be defined as preparedness to receive distress signals and call letters slowly. A "watcher" or cargo-grade operator will summon a first or second-class operator if necessary.

23. All American vessels required by the Act of July 23rd, 1912, to be equipped with radio apparatus, and operators *must* at all hours maintain a continuous *watch*; that is to say, an operator or *watcher* must be "listening-in" continuously. This requirement is outside of and above the requirement based on the classification under which the ship's station is licensed.

24. Vessels voluntarily equipped are not required to maintain this continuous *watch*. Vessels voluntarily equipped are, however, subject to the following requirements as to *watch* according to the class assigned to them in their station licenses.

25. If a licence of the second class be issued to a voluntarily equipped vessel, the station *must* maintain a continuous *watch* for at least seven hours a day and a *watch* of ten minutes at the beginning of every hour.

26. The grade of operators required on vessels of each class are prescribed in the London

Convention Service Regulations, Article X. A continuous *watch* may be maintained by one commercial second-grade operator and one cargo-grade operator on cargo steamers.

27. Passenger vessels coming under the Act of July 23rd, 1912, which carry or are licensed to carry twenty-five or more passengers, *must* be placed in the first class:

(a) If they have an average speed in service of fifteen knots or more.

(b) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board 200 persons or more (passengers and crew), and that in the course of their voyage they go a distance of more than 500 sea miles between any two consecutive ports.

The *service* shall be carried on by at least two commercial first-grade operators.

28. Cargo vessels coming under the Act of July 23rd, 1912, which are required to maintain a continuous *watch*, *must* be placed in the second class if continuous *service* is not maintained. On cargo steamers a continuous *watch* may be maintained by at least one commercial second-grade operator and one cargo-grade operator.

29. Passenger vessels coming under the act of July 23rd, 1912, but which are not *required* to be entered in the first class, *may* be entered in the first or second class, according to whether continuous *service* or continuous *watch* is maintained. The number and grade of operators required is determined by *service* or *watch*. On passenger vessels coming under the Ship Act but entered in the second class at least two second-grade operators are required to maintain continuous *watch*.

30. Cargo vessels which coming under the Act of July 23rd, 1912, and are required to maintain a continuous *watch*, may be placed in the first class, if continuous *service* is maintained. (For operators, see par. 28.)

31. All vessels voluntarily equipped with radio apparatus and which have no specified hours of *service* or *watch* *must* be placed in the third class.

32. Any vessel voluntarily equipped may be placed in the first class if continuous *service* is maintained, or in the second class if a continuous *watch*, or a *watch* of limited duration, such as specified above for vessels of the second class is maintained.

33. In all ship stations transmissions shall be made only by operators holding commercial first or second grade licenses or higher.

34. Commercial *service* shall be maintained by not lower than commercial first-grade operators.

35. Vessels which are voluntarily equipped with radio apparatus for their own convenience and for the correspondence of officers and crew *must* employ at least one commercial second-grade operator or higher.

36. Radio telephone apparatus on vessels not coming under the Act of July 23rd, 1912, *must* be operated by a person holding a cargo-grade license or higher.

37. The owners of ship stations desiring to change the classification of a ship *must* apply for a new license.

LAND-STATIONS.

38. Coast stations are stations which transmit messages to vessels at sea or on the Great Lakes, or whose operations can interfere with the exchange of messages between ship and ship or ship and coast. The principal

purpose of the regulation of radio communication, international and national, is to secure the greatest efficiency of maritime communication through this agency, especially as a means of promoting safety to life.

39. Inland stations are stations which cannot transmit messages to vessels at sea or on the Great Lakes and whose operations cannot affect the transmission of messages between ship and ship or ship and coast. This may be due to their geographical location or to their range, dependent on power and aerial, or conditions. In some instances actual inspection may be necessary to determine whether a station should be licensed as a coast station or an inland station. An operator or owner in doubt as to the classification of his station should communicate the facts to the radio inspector of his district when applying for a licence.

40. Stations are bound to give absolute priority to calls of distress from ships, to similarly answer such calls, and to take such action with regards thereto as may be required.

41. The working of stations shall be organised as far as possible in such manner as not to disturb the service of other stations.

42. All coast stations (par. 38), excepting general and restricted amateur stations, are required to be able to transmit on the wavelengths of 300 and 600 metres for the purpose of transmitting or relaying distress messages or signals and messages relating thereto, if necessary.

43. Coast stations primary intended for long waves and long-distance transmission may install an auxiliary antenna and auxiliary transmitter to comply with the short wavelength requirements.

44. The international standard wavelength is 600 metres, and the operators of all coast stations are required, during the hours the station is in operation, to "listen-in" at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiving apparatus tuned to receive this wavelength, for the purpose of determining if any distress signals or messages are being sent and to determine if the transmitting operations of the "listening stations" are causing interference with other radio communication.

45. General public service may be defined as "paid business," conducted on commercial wavelengths between ship and shore or ship and ship.

46. Limited public service may be defined as "paid business" between certain designated land stations, ships or lines of ships, and must be conducted on some authorised wavelength other than 300 or 600 metres.

47. All special service must be conducted on some authorised wavelength other than 300 or 600 metres, not interfering with general public service.

48. Special commercial, special amateur, and all stations which have no authorised rates, shall not transmit or accept public correspondence from other stations, except in case of emergency.

49. If a general public-service coast station also maintains a limited commercial service with other stations on land or with vessels at sea, the limited commercial service must be conducted on some authorised wavelength other than 300 or 600 metres, but this service can be authorised on a general public-service

coast station license without stating the specific hours, it being understood that the limited commercial service is conducted only when no general public service business is on file.

50. If a general public-service coast station also maintains a public service between fixed points on land, the service between the land stations must be conducted on some authorised wavelength other than 300 or 600 metres, and a separate form, No. 761, should be submitted covering "Limited public service," giving the exact hours of such service.

CLASSIFICATION OF LAND STATIONS AND GRADES OF OPERATORS REQUIRED.

51. Both coast stations (the word "coast stations," "shore stations," and "coastal stations" are used interchangeably) and inland stations are divided for the purposes of the administration of the Act into the following classes:

- (1) Public-service stations—
 - (a) General.
 - (b) Limited.
- (2) Limited commercial stations.
- (3) Experiment stations for the development of radio communication.
- (4) Technical and training school station.
- (5) Special amateur stations.
- (6) General amateur stations.
- (7) Restricted amateur stations.

52. CLASS I.—(a) *Public-Service stations, general*, are those open to general business between coast and ships and include those operated by common carriers under the Act of February 4th, 1887, to regulate commerce, amended June 18th, 1910. They are required to maintain a constant service when open. Every coastal station open to public service shall at all times be ready to receive messages of such wavelengths as are required by the International Convention in force. (Sec. 4, Regulation 1, Act of August 13th, 1912.) The station rates are authorised in the licence and published in the Official Berne List. Whenever such stations do not insure a constant service, transmitting and receiving day and night without interruption, the Secretary of the Navy is directed to open naval radio stations within 100 miles thereof to public business. (Sec. 4, Regulation 18, Act of August 13th, 1912.) The Secretary of War is authorised by the Act of May 26th, 1900 (31 Stat., 206), to open Alaskan military stations to public service.

53. General public service shall be conducted only by operators holding commercial first-grade licenses or higher.

54. CLASS I.—(b) *Public-service stations, limited*, are reserved for a limited public service, determined by the object of the correspondence or other circumstances independent of the system employed. Stations of this class transmit and receive public messages to and from certain stations only, which are designated in the license. The rates are authorised in the licenses, and if not published in the official list they may be obtained from the licensee.

55. The service of limited public service coast stations shall be carried on by commercial first-grade operators or higher.

56. The service of limited public service inland stations shall be carried on by commercial second-grade operators or higher,

57. CLASS 2.—*Limited commercial stations* are not open to public service and are licensed for a specific commercial service or services defined in the license. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorised.

58. If a coast station, the operators shall hold a commercial second-grade license or higher. (Par. 57.)

59. CLASS 3.—*Experiment stations*.—The Secretary of Commerce is authorised by section 4 of the Act to grant special temporary licences "to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations." Applicants for such licences should state any technical result they have already produced, their technical attainments, etc. The fact that an applicant desires to experiment with his equipment does not justify or require a license of this class. Most experiments can be made within the limitations of general and restricted amateur station licenses or by use of an artificial antenna to prevent radiation.

60. Experiment stations may be operated by a person holding an experiment and instruction grade license or higher.

61. CLASS 4.—*Technical and training-school stations* will be licensed, according to the degree of technical training attained and imparted and to local conditions.

62. The grade of operators required will be specified when the license is issued.

63. CLASS 5.—*Special amateur stations* may be licensed by the Secretary of Commerce to use a longer wavelength and a higher power on special application. Applications for this class from amateurs with less than two years' experience in actual radio communication will not be approved. The application must state the experience and purpose of the applicant, the local conditions of radio communication, especially of maritime radio communication in the vicinity of the station, and a special license will be granted only if some substantial benefit to the art or to commerce apart from individual amusement seems probable. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

64. Special amateur coast stations must be operated by a person holding a commercial second-grade license or higher. Inland stations may be operated by persons holding amateur second-grade licenses or higher.

65. CLASS 6.—*General amateur stations* are restricted to a transmitting wavelength not exceeding 200 metres and a transformer input not exceeding 1 kw. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

66. CLASS 7.—*Restricted amateur stations*, within five nautical miles of a naval or military station, are restricted to a wavelength not exceeding 200 metres and to a transformer input not exceeding $\frac{1}{2}$ kw. (Sec. 4, Regulation 16, Act of August 13th, 1912.)

67. Amateur first or second grade operators or higher are required for general and restricted amateur stations.

68. The license does not specify the number of operators required, but provides that the station shall at all times while in operation be under the care of an operator licensed for that purpose. The grade and number of operators as required by law is determined by the service of the station.

69. *Special stations for exceptional distances* are land stations designed to carry on trans-oceanic radio communication as between the United States and European countries, or between the Pacific coast and Hawaii, or from the United States over similar long distances at sea to another land station, or (inland) to carry on radio communication overland over exceptional distances. These stations will all come under one of the classifications named above and the license will indicate the stations for which communication is authorised and indicate the range.

REGULATIONS COMMON TO LAND AND SHIP STATIONS.

70. Any change in the characteristics of the radio apparatus or service of the station must be authorised by the Secretary of Commerce.

71. Every land and ship station open to general public service shall have, as a part of the station equipment, a copy of the Official Berne List of Radiotelegraph Stations and supplements thereto, as issued to comply with section 2 of the Act of July 24th, 1910. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

72. The service regulations of the London Convention, Article VII, paragraphs 1 and 2b, require a reduction of power or range under certain conditions. A proper resistance, impedance coil, or reactance regulator in the primary circuit is recommended. In certain cases the reduction of voltage or decreasing of coupling may be approved upon recommendations of radio inspectors.

73. Persons or corporations holding licenses for radio stations, either land or ship, if practicable, must submit the license to the radio inspector for the district, whenever the station or vessel goes out of commission for a period exceeding three months. The Commissioner of Navigation should be notified promptly of any intention to suspend or discontinue the service of any commercial station.

74. If there is no intention to resume the same service or if the station or vessel will enter a different service from that indicated by the license, the radio inspector will submit the license to the Bureau, together with a statement of the facts. Otherwise the radio inspector may retain the license in his files for safe keeping until the date of its expiration, when it will be forwarded to the Bureau for cancellation.

75. When the station goes into commission the owner may apply to the radio inspector for the return of the license. The radio inspector will satisfy himself that the station corresponds to the schedule of the station as shown in the license, and if so, the license will be returned.

76. Stations desiring to conduct tests should communicate with the radio inspector by letter or telephone, stating the probable length of time that will be required. Stations conducting such tests or temporary experiments should "listen-in," to determine that no interference is being caused, and during the tests

should "listen-in" frequently for the interference signal, "QRM." Stations conducting tests should transmit their official call signal frequently. Attention is invited to the Act of August 13th, 1912, section 5:

That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully, or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanor, and upon a conviction thereof the owner or operator, or both, shall be punishable by a fine not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

77. The Department holds that interference caused by tests of the character described above (par. 76) is "wilful" when no "listening-in" precautions are taken and the call signal of the station sending is not repeated at intervals.

APPLICATIONS FOR SHIP AND LAND STATION LICENSES, RENEWALS, AND DUPLICATES.

78. The Act does not apply either afloat or ashore to—

(a) Apparatus for radio communication which merely receives radiograms and is not equipped for sending.

(b) Apparatus for the transmission of radiograms exclusively between points in the same State, if the effect of such transmission does not extend beyond the State (so as to interfere with the radio communication of other States), or if the effect of such transmission does not interfere with the reception of radiograms from beyond the State (so as to interfere with the interstate radio communication of that State).

(c) Apparatus for radio communication which has been issued to the Organised Militia by the War Department or to the Naval Militia by the Navy Department and is used for official purposes only.

79. The owner or operator of any apparatus who may be in doubt whether his apparatus, under this paragraph, is exempt from license may write the facts to the radio inspector for his district before applying for a license.

80. The apparatus for transmission of radiograms, or signals on any vessel of the United States not permanently moored, requires a license.

81. Apparatus for radio communication on land within the jurisdiction of the United States (excluding the Philippine Islands and excluding apparatus of the Government of the United States) must be licensed if—

(a) The apparatus is a means of commercial intercourse among the several States or with foreign nations; or

(b) The apparatus transmits radiograms or signals the effect of which at any time extends beyond the State; or

(c) The apparatus interferes with the receipt of messages in any State from beyond such State.

82. Station licenses for the use and operation of apparatus for radio communication under the Act may be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico.

83. Licenses can be issued to clubs if they are incorporated or if a member will accept the responsibility for the operation of the apparatus, carrying with it the possibility of being penalised for infraction of the laws.

84. Applications for station licenses of all classes should be addressed to the United States Radio Inspector for the district in which the station is located, who will forward the necessary blank forms and information. The limits of the districts and addresses of radio inspectors are given on page 68, paragraph 166.

85. Upon receipt of the forms, properly completed, the radio inspector will make a thorough inspection of the station if practicable.

86. When applications and forms have been properly submitted, ship and amateur stations may be operated in accordance with the laws and regulations governing the class of station for which application for license has been made, until such time as the application can be acted upon unless the applicant is otherwise instructed and provided temporary official call letters are assigned.

87. General and restricted amateur-station licenses are issued directly by radio inspectors. Station licenses of all other classes are issued from the office of the Commissioner of Navigation, Department of Commerce. Applications and forms are forwarded by radio inspectors with recommendations by them.

88. Stations desiring to operate different portions of the day under different classifications shall submit application for each service, giving exact hours for each. If approved, each classification will be specified in the license.

89. The owner of an amateur station may operate his station in accordance with the laws if his application for a license has been properly filed, but has not been acted upon. An application for an operator's license must also have been filed, and every effort made to obtain the license before the station may be operated.

90. "Provisional" station licenses are issued to amateurs remote from the headquarters of the radio inspector of the district in which the station is located. These licenses are issued as a matter of convenience and record. If, under inspection, the station is found to comply with the law, the inspector will strike out the word "Provisional" and insert the date of inspection and his signature at the bottom of the license.

91. If such a station is found not to comply with the law the provisional license may be cancelled until such time as the apparatus is readjusted to meet the requirements of the law: *Provided, however*, That consideration will be given to any reports of interference filed against such a station.

92. All persons are warned that it is unlawful to operate stations after licenses have expired unless application for renewal has been properly made.

93. Owners desiring to renew licenses must complete new forms as prescribed for original applications. Amateur-station licenses issued on current forms may be renewed by the following endorsement on the back, provided no changes in the equipment or location have been made; otherwise a new license will be issued: "This license renewed for one year.

Radio Inspector." The Commissioner of Navigation will be notified of the name and call signal in every case of renewal in this manner.

94. Any person applying for a duplicate license to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector of the district, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate license or a duplicate will be forwarded through the inspector's office.

95. A duplicate license will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

REGULATIONS GOVERNING RADIO OPERATORS.

CLASSES, GRADES AND REQUIREMENTS.

E 96. (1) Commercial extra first grade; (2) commercial first grade; (3) commercial second grade; (4) commercial cargo grade; (5) commercial temporary permit; (6) experiment and instruction grade; (7) amateur first-grade; (8) amateur second grade.

97. The Service Regulations of the International Convention require that "the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject."

98. Such certificates shall attest the professional efficiency of the operator as regards—

(a) Adjustment of the apparatus and knowledge of its functioning;

(b) Transmission and acoustic reception at the rate of not less than twenty words a minute (Continental Morse) for commercial first-grade operators and not less than twelve words per minute for second-grade operators;

(c) Knowledge of the regulations governing the exchange of wireless telegraph correspondence.

(d) The certificate shall furthermore state that the Government has bound the operator to secrecy with regard to the correspondence.

99. The International Convention has been ratified by the principal maritime nations, dominions and provinces. Radio operators holding valid certificates issued by foreign Governments which are parties to the convention will be recognised by this department as persons "skilled in the use of such apparatus" within the meaning of the Act, unless in the case of a specific individual there may be special reason to doubt the operator's skill and reliability. Such certificates should be ready at hand for the inspection of radio inspectors or customs officers before the steamer departs from the United States.

100. In the case of a vessel subject to the Act under the flag of any nation not a party to the International Convention, the radio operator, before the departure of the vessel from the United States, must furnish to the inspector evidence that he is "skilled in the use of the apparatus." This evidence shall consist of an examination on board by the radio inspector.

101. *Commercial extra first class.*—The Department of Commerce will issue a special license, to be known as commercial extra first grade to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition.

102. These licenses will be given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations.

103. Applicants for the commercial extra first-grade license must pass a special examination. To be eligible for this examination they must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the Act of June 24th, 1910, or licenses under the Act of August 13th, 1912, must record eighteen months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by endorsement on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalised for a violation of the radio laws and regulations.

104. A speed of at least thirty words per minute Continental Morse, and twenty-five words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

105. All examination papers, including the code test sheets, will be marked and forwarded to the Commissioner of Navigation, with a recommendation by the radio inspector or examining officer. Examination papers will be marked upon the basis of 100, and licenses will be recommended only if eighty or better is attained.

106. Licenses of this grade will be issued by the Commissioner of Navigation, endorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

107. *Commercial first class.*—The applicant must pass a satisfactory examination in—

(a) The adjustment, operation, and care of the apparatus, including correction of faults and change from one wavelength to another.

(b) Transmitting and receiving by ear at a speed of not less than twenty words a minute in Continental Morse (five letters to the word).

(c) Use and care of storage battery or other auxiliary power apparatus.

(d) Knowledge of the international regulations in force applying to radio communication.

(e) Knowledge of the requirements of the Acts of Congress to regulate radio communication (secs. 3, 4, 5, 6, and 7 of the Act of August 13th, 1912).

108. The commercial extra first grade and the commercial first-grade licenses qualify holders for employment at any ship or land station of any class.

109. *Commercial second class.*—The applicant must pass a satisfactory examination in all the subjects prescribed above for the first grade, with the exception that the minimum speed in transmitting and receiving shall not be less than twelve words a minute in Continental Morse, and the examination in the subjects will not be as comprehensive as that given first-grade operators.

110. *Commercial cargo grade.*—Section 2 of the Act of July 23rd, 1912, provides: "On cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life."

111. The examination will be conducted so as to determine the following facts:

(a) That the applicant is sufficiently familiar with the Continental Morse Code to recognise the distress signal (SOS), when included in a list of other words or signals sent slowly (approximately five words a minute).

(b) That the applicant is sufficiently familiar with the Continental Morse Code to recognise radio call letters of the vessel on which he desires to operate when sent slowly and repeated several times.

(c) That the applicant is sufficiently familiar with the type of the receiving apparatus of the vessel on which he desires to operate to determine by buzzer or similar test that the detector or receiving apparatus is properly adjusted to receive signals.

112. Examining officers and radio inspectors are authorised to issue a certificate, in the form of an amateur first-grade license, after examination, to indicate the facts above enumerated in the case of a member of the crew or other person, and experience under this form will be credited by examining officers if the holder later applies for examination for a commercial license. These licenses will be marked "Cargo" in the upper right-hand corner under the serial number.

113. *Commercial temporary permit.*—Section 3 of the Act of August 13th, 1912, provides: "In case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the Radio Ship Act of June 24th, 1910."

114. The temporary permit, in the form of a letter to the operator, is to be issued only in cases of emergency and will be valid for one voyage from to unless the proper license or properly licensed operator can be obtained en route.

115. The permits should be issued only to persons who the collector of customs has reason to believe are skilled in the use of the apparatus, but have not had the opportunity to present themselves for examination before Government officers authorised to conduct examinations and furnish licenses.

116. The collector of customs will forward to the Department of Commerce (Bureau of Navigation) a report covering each temporary permit issued and the reasons for its issue.

117. *Experiment and instruction grade.*—Experimenters and instructors of scientific attainments in the art of radio communication whose knowledge of the radio laws satisfies the radio inspector or the examining officer may obtain this grade license, provided they are able to transmit and receive in the Continental Morse Code at a speed sufficient to enable them to recognise distress calls or the "keep-out" signals.

118. The operator's license for this grade is a commercial license, endorsed by the Secretary of Commerce with a statement of the special purpose for which it is valid.

119. If the applicant qualifies, the radio inspector or examining officer will forward the papers to the Commissioner of Navigation, with his recommendation. If approved, the license will be properly endorsed by the Secretary of Commerce and delivered to the licensee through the recommending officer.

120. This license has no reference to the instruction of radio operators as such, but is required by those operating apparatus licensed as experimental stations but who are unable to obtain commercial grade operators' licenses.

121. Amateurs before applying for licenses should read and understand the essential parts of the International Radiotelegraphic Convention in force and sections 3, 4, 5, and 7 of the Act of August 13th, 1912. The Department recognises that radio communication offers a wholesome form of instructive recreation for amateurs. At the same time its use for this purpose must observe strictly the rights of others to the uninterrupted use of apparatus for important public and commercial purposes. The Department will not knowingly issue a license to an amateur who does not recognise and will not obey this principle. To this end the intelligent reading of the International Convention and the Act of Congress is prescribed as the first step to be taken by amateurs. A copy of the radio laws and regulations may be procured for this purpose from the radio inspectors or from the Commissioner of Navigation, Department of Commerce, Washington, D.C., but they are not for public distribution. Additional copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

122. *Amateur first grade.*—The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the International Convention and Acts of Congress in so far as they relate to interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive in Continental Morse at a speed sufficient to enable him to recognise distress calls or the official "keep-out" signals. A speed of at least ten words per minute (five letters to the word) must be attained.

123. *Amateur second grade.*—The requirements for the second grade will be the same as for the first grade. The second-grade license will be issued only where an applicant cannot be personally examined or until he can be examined. An examining officer or radio inspector is authorised in his discretion to waive an actual examination of an applicant for an amateur license, if the amateur for adequate reasons cannot present himself for examination but in writing can satisfy the examining officer or radio inspector that he is qualified to hold a license and will conform to its obligations.

EXAMINATIONS.

124. The following requirements and method of conducting examination for radio operators' licenses will be adopted at all examining offices.

125. The test shall consist of messages with call letters and regular preambles, conventional signals and abbreviations and odd phrases, and shall in no case consist of simple, connected reading matter. The test will be conducted by means of the omnigraph or other automatic instrument wherever possible.

126. The test shall continue for five minutes at a speed of twenty words, twelve words and ten words per minute, respectively, for the commercial first, second, and lower grades, and to qualify the applicant must receive twenty, twelve, or ten words in consecutive order.

127. The code test sheets written by the applicant will be forwarded to the Commissioner of Navigation with other papers and the speed attained noted in the lower left-hand corner of the first sheet.

128. An applicant will be given credit for the maximum speed he can attain.

129. The practical and theoretical examination shall consist of seven comprehensive questions under the following headings and values:

	Points, maximum value.
(a) Experience	20
(b) Diagram of receiving and transmitting apparatus	10
(c) Knowledge of transmitting apparatus	20
(d) Knowledge of receiving apparatus	20
(e) Knowledge of operation and care of storage batteries	10
(f) Knowledge of motors and generators	10
(g) Knowledge of international regulations governing radio communication and the United States radio laws and regulations	10
	100

130. Seventy-five constitutes a passing mark for the first-grade commercial. Sixty-five constitutes a passing mark for the second-grade commercial.

131. Applicants who fail to attain twenty words in the code test but who attain a mark of between sixty-five and seventy-five in the written examination may be issued second-class licenses, if they can receive at least twelve words per minute.

132. Question (a) shall determine the applicant's practical knowledge and experience in handling radio apparatus. An applicant's experience will be determined largely from the personal question sheet, and from satisfactory letters or references submitted. Experience, operating first-class amateur apparatus, or the apparatus provided in good training schools, will be given a reasonable value, but applicants who have had experience as apprentices at commercial shore stations or on board vessels will receive higher marks.

133. No applicant who fails to qualify will be re-examined at any examining office within three months from date of the previous examination. All examination papers, whether the applicant qualifies or not, will be forwarded to the Bureau of Navigation for filing as "Operator's record." When the records of the Bureau develop the fact that an applicant has failed to qualify and has applied for re-examination or been re-examined at the same or another office within three months, his existing license may be suspended or

revoked by the Secretary of Commerce. Applicants to whom are issued second-grade licenses will not be examined for first-grade within three months under the same rule.

PLACES WHERE EXAMINATIONS ARE HELD.

134. (Excised.)

135. Naval radio stations: San Juan, P.R.; Colon, R.P.; Honolulu, H.T.

136. United States Army stations: Fort St. Michael, Alaska; Fort Valdez, Alaska.

137. Bureau of Navigation, Department of Commerce, Washington, D.C.

138. Radio inspectors, at their offices and elsewhere, by special arrangement.

139. Additional opportunities for taking the examination will be afforded as may be deemed necessary, and these special dates and places may be ascertained by communication with the Commissioner of Navigation, or nearest radio inspector.

140. All licenses, when awarded, will be delivered through the officer who conducted the examination.

141. Examinations for the commercial extra first-grade licenses will be held at the following offices only by appointment.

142. (Excised.)

143. United States radio inspectors, custom-houses: New Orleans, La.; San Francisco; Cal.; Seattle, Wash.; Chicago, Ill.; Boston, Mass.; New York, N.Y.; Baltimore, Md.; Detroit, Mich.; Norfolk, Va.

144. Commissioner of Navigation, Department of Commerce, Washington, D.C.

145. In special cases, upon application to the Commissioner of Navigation, arrangements may be made for examinations at other points.

APPLICATIONS FOR EXAMINATIONS FOR RADIO OPERATORS' LICENSES, RENEWALS, AND DUPLICATES.

146. An operator's license may be granted to any person without regard to sex, nationality or age if the applicant can fulfil the requirements for the class of license desired.

147. Applicants for licenses should communicate in writing with the commandants, commanding officers, or officers in charge at navy yards, and army posts, with the Commissioner of Navigation, or radio inspectors, in order to fix the date when they can be examined. (See pars. 134-145.)

148. Commercial licenses can only be obtained by personal examination. Where applicants are at remote points or cannot proceed to examining offices, efforts will be made to examine them through radio inspectors when they are in that vicinity, but special trips cannot be made for that purpose.

149. Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 (application for operator's license) and to the radio inspector in their vicinity for Form 762 (application for license for land station). If the application for operator's license is also made to the radio inspector, both applications should be forwarded in the same envelope.

150. Amateur operators at points remote from examining officers and radio inspectors may be issued second-grade amateur licenses without personal examination. Examinations for first-grade licenses will be given by the radio inspector when he is in that vicinity, but special trips cannot be made for this purpose (see par. 123).

151. Persons holding radio operator's licenses, amateur second grade, should make every effort to appear at one of the examination points to take the examination for amateur first-grade license or higher.

152. Persons holding radio operator's licenses of any class or grade should, before their licenses expire, apply to the nearest radio inspector or examining officer for renewal and submit Form 756 in duplicate.

153. Radio operators of the commercial class or cargo grade whose licenses show on the service records satisfactory service for three months out of the last six months of the license term may be issued new licenses without re-examination. Other operators who submit satisfactory evidence to the examining officer, showing actual operations of radio apparatus for three months during the last six months of the license term, may be issued new licenses without re-examination. All others will be re-examined in the usual manner.

154. Whether or not a new license is issued, the radio inspector or examining officer will forward one copy of Form 756, properly completed, to the Commissioner of Navigation, Department of Commerce. If a new license is not issued, the reason therefor will be stated on the back of the form.

155. Any operator applying for a duplicate license to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector or examining officer who issued the original, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate license. A duplicate license will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

156. Operators' licenses are not valid until the oath for the preservation of the secrecy of messages is properly executed before a notary public or other officer duly authorized to administer oaths. Licenses must indicate on their faces that the oath has been taken and the officer administering the oath on the back of the license should sign also in the blank provided on the face.

157. Operators' licenses should be framed and posted in the radio room, and licenses for stations should be accessible at all times to inspectors.

158. Under the supervision of a licensed operator an apprentice or unlicensed person may learn the art by the actual use of the apparatus, but the licensed operator who fails to enforce obedience to the regulations by the apprentice or unlicensed person serving under his supervision is liable to penalties as if he had himself violated the regulations.

159. An individual record is kept in the Bureau of Navigation, Department of Commerce, at Washington, of each licensed operator. Each operator's examination papers and all reports in regard to interference or violations of the radio laws and regulations are filed for reference.

160. Radio operators holding licenses of any grade or class and applying for examination for any other grade or class must submit to the examining officer Form 756, in duplicate. If a new license is issued the license held by the applicant must be surrendered.

161. Radio operators who pass the examination for a higher class or grade license are required to surrender their existing licenses, which will be forwarded to the Commissioner of Navigation with the other papers.

162. Operators desiring to retain their expired or cancelled licenses may make application therefor to the Commissioner of Navigation.

GENERAL INFORMATION.

ADMINISTRATION AND ADMINISTRATIVE DISTRICTS.

F 163. The Department has established, for the purpose of enforcing, through radio inspectors and others, the acts relating to radio communication and the International Convention, the following districts, with the principal office for each district at the custom house of the port named.

164. Communications for radio inspectors should be addressed as follows, and not to individuals: Radio Inspector, Customhouse, (city), (State).

165. Communications for the Bureau of Navigation should be addressed as follows, and not to individuals: Commissioner of Navigation, Department of Commerce, Washington, D.C.

166. (1) BOSTON, MASS.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

(2) NEW YORK, N.Y.: New York (county of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (Counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth Hudson, and Ocean).

(3) BALTIMORE, MD.: New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, and all counties south of the Blue Mountains, and Franklin County), Delaware, Maryland, Virginia, District of Columbia.

(4) SAVANNAH, GA.: North Carolina, South Carolina, Georgia, Florida, Porto Rico.

(5) NEW ORLEANS, LA.: Alabama Mississippi, Louisiana, Texas, Tennessee, Arkansas, Oklahoma, New Mexico.

(6) SAN FRANCISCO, CAL.: California, Hawaii, Nevada, Utah, Arizona.

(7) SEATTLE, WASH.: Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

(8) DETROIT, MICH.: New York (all counties not included in second district), Pennsylvania (all counties not included in third district), West Virginia, Ohio, Michigan (Lower Peninsula).

(9) CHICAGO, ILL.: Indiana, Illinois, Wisconsin, Michigan (Upper Peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

REPORTING OF VIOLATIONS.

167. The regulations established by law, or by the authority of law, or of the International Convention, will be enforced by the Secretary of Commerce through collectors of customs, radio inspectors, and other officers of the Government.

168. The service regulations of the radio-telegraphic Convention in force provide that "no station on shipboard shall be established or worked by private enterprise without authority from the Government to which the vessel is subject." Such authority shall be in the nature of a license issued by said

Government. Stations on foreign ships will be licensed by their Governments respectively. Inspectors will report to the Commissioner of Navigation stations on foreign ships not so licensed.

169. A radio inspector is authorised in exceptional cases to act outside of his district for the convenience of commerce. In such cases he will communicate before or after acting with the inspector in whose district he has acted. Radio inspectors are authorised to communicate directly with collectors of customs and to co-operate with them in the enforcement of the law.

170. Violations of the laws and regulations will be reported to the chief customs officer of the district in which the offence occurs, who will report the case to the Secretary of Commerce (Bureau of Navigation), according to the procedure followed in violations of the navigation laws. Misdemeanours will be reported to the United States district attorney in the usual manner.

171. Collectors of customs and radio inspectors are enjoined that the reports required by paragraph 170 must be precise statements of the facts as the basis for possible proceedings by the United States attorney.

172. Violations by the master of a vessel of the United States of the provisions of the second paragraph of section 1 of the ship act will be reported to the collector of customs directly, and the usual procedure in cases of fines and penalties will be followed.

INSPECTION OF SHIP STATIONS.

173. The radio inspectors and customs officers, as far as practicable shall visit steamers subject to the act before they leave port and ascertain if they are equipped with the apparatus in charge of the operators prescribed by law and regulation.

174. When the radio apparatus is certified as complying with the requirements of law by the competent authorities of a foreign Government, such certificate will be recognised by this Department, but the radio inspector or customs officer may, if he deem it necessary or desirable, satisfy himself that the apparatus is in good working order.

175. Whenever practicable the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of July 23rd, 1912, that the apparatus is efficient and in good working order within the meaning of the Act, and if satisfied he shall issue a certificate in the form of Appendix A (form 752). The duplicate of these certificates will be filed with the collector of customs as a record of the radio equipment on vessels sailing from his port.

176. These certificates will be issued only if the inspection is made within two hours of sailing time.

177. For each clearance the master of a steamer coming under the Act of July 23rd, 1912, is required to furnish to the customs officer a certificate in the form in Appendix B (Form 753). Such certificate shall be retained in the files of the collector of customs. Whenever the radio inspector is absent from his home port he will notify the collector of customs, who will arrange for the collection of certificates and survey of equipment.

178. Where a steamer subject to the radio law is without the apparatus and the operators prescribed, or either of them, and is about to attempt to leave port, the radio inspector or customs officer visiting the vessel shall:

(a) Furnish the master with a memorandum (stub of Form 771) of the particulars in respect of which the law has not been complied with and the penalty;

(b) If convenient, notify the vessel's agents or the proper person in charge of the apparatus so that the necessary corrections may be made before sailing.

179. If a steamer clears in violation of the law the radio inspector or customs officer shall submit to the collector of customs of the port a written report, stating the exact nature of the violation, the section of the law violated, and the penalties involved and all of the circumstances in connection therewith which will be of service to the collector and to the Secretary of Commerce in determining what action shall be taken. A copy of the report will be forwarded to the Commissioner of Navigation.

180. Statements should be obtained from operators, ships officers, or other witnesses at the time the violation is discovered and should accompany the report to the collector of customs.

181. The collector of customs will report the case to the Secretary of Commerce in the usual manner as a navigation fine case.

182. Merchant vessels chartered by the United States Government are subject to the Act of August 13th, 1912, in every case, if the radio apparatus is owned and operated by a commercial company.

183. Merchant vessels chartered by the United States Government for the transportation of persons or supplies are subject to the requirements of the ship act (Act of July 23rd, 1912), if the vessel is controlled and operated by the owners. Vessels commanded wholly or in part by Government officers are not subject to the ship act.

184. Government vessels or vessels chartered by the Government are subject to the act of August 13th, 1912, if the radio equipment is owned and operated by private interests.

185. The ship act does not authorise the refusal of clearance in case of violation of its provisions, but specifically provides for the imposition of a fine in a sum not more than \$5,000.

186. The act does not apply to a vessel at the time of entering a port of the United States. Radio inspectors and customs officers may, however, accept as evidence of the efficiency of the operators and the skill of an operator messages shown to have been transmitted and received by him over a distance of at least 100 miles, by day, during the voyage to the United States.

OPERATORS ON FOREIGN VESSELS.

187. In so far as licensed operators are concerned a sharp distinction should be drawn between the Act of July 23rd, 1912, which requires apparatus and operators for radio communication on steamers and the Act of August 13th, 1912, to regulate radio communication.

188. The Act of July 23rd, 1912, amending the Act of June 24th 1910, is designed to promote safety at sea through the employment of apparatus and operators to transmit and receive distress calls and other calls relating to perils and aids to navigation. It provides that in the case of American and foreign vessels subject to its provisions "the radio equipment must be in charge of two or more persons skilled in the use of such apparatus." This Act does not require that

the operators shall be licensed, and the penalty prescribed in section 3 of the Act is not incurred by the master of a vessel whose operators are "skilled in the use of such apparatus," even though they may not be licensed.

189. The Act of August 13th, 1912, is designed to execute in behalf of the United States the International Radiotelegraphic Convention and thus to promote orderly exchanges by radio communication. For this purpose the International Radiotelegraphic Convention (Service Regulations) provides that the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject.

190. Section 3 of the Act of August 13th, 1912, carries out this provision of the International Convention by providing licenses for operators on American vessels. If an unlicensed person serves in charge or in supervision of the use and operation of the apparatus both he and his employer are liable to a fine of not more than \$100 or imprisonment for not more than two months or both. This section and penalty do not apply to operators on foreign ships. But operators on the ships of foreign nations signatory to the International Radiotelegraphic Convention, as shown above, are required to have certificates or licenses from their own governments, and if not so certificated, the obligations of the convention have not been observed. The convention in the Service Regulations provides for this situation.

191. The Act of July 23rd, 1912, as stated, requires that on American and foreign ships the operators must be "skilled in the use of such apparatus," but does not require that they must be licensed. To facilitate commerce and simplify administration, operators presenting American licenses or foreign certificates are accepted as "skilled in the use of such apparatus," except where there may be special reasons to doubt the operator's skill or reliability. Where operators on American or foreign ships do not have such licenses or foreign certificates, radio inspectors or customs officers under the Act of July 23rd, 1912, may accept other competent evidence of skill or may examine such operators.

OFFICIAL INTERNATIONAL LIST OR COAST AND SHIP RADIO STATIONS OF THE WORLD AND STATION RATES.

192. The list of land and ship stations of the United States including amateurs, giving call letters, wavelengths, nature of service, etc., can be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

193. Supplements to this list are issued monthly and the list is revised annually, as of July 1st. Information concerning amateur stations will not be included in the supplements, but in the annual edition only.

194. The introduction to the list of "Radio Stations of the United States" contains information concerning the assignment of international and amateur call letters.

195. A copy of the Official Berne List, and supplements as issued, are required as a part of the equipment of every station open to general public service.

196. The International List of Radio Stations of the World (edition in English) can be procured from the International Bureau of the Telegraphic Union (Radiotelegraphic Service), Berne, Switzerland.

197. In addition to the information contained in the pamphlet of the United States stations, published by the Bureau of Navigation, the international list shows geographical locations, normal ranges in nautical miles, radio systems and rates.

198. The international list includes the Government and commercial land and ship stations of the United States. The list is divided into three parts. The first part contains a list of ship stations, grouped by countries and arranged alphabetically; the second part contains a list of land stations arranged in the same manner; and the third part contains tables of land line and cable charges from coast radio stations to inland and various other points. In computing the total word rate applicable to a radiogram from a ship station to an inland point or *vice versa*, the three rates must be added. The rates in the international list are stated in francs. For approximate purposes 1 franc equals 20 cents and 5 centimes equals 1 cent. Supplements to the international list will be issued monthly, and will contain new stations and tables of alterations.

199. The International Alphabetical List of Call Letters (stations of the world) is also issued by the international bureau at Berne and supplements will be issued monthly.

200. Neither the international list proper nor the supplements will contain a list of amateur stations.

201. Inquiries as to the subscription price of these lists should be made direct to the Berne bureau, at the address given above. (See par. 196.) Remittances to Berne should be made by international postal money order.

MISCELLANEOUS INFORMATION.

202. Stations equipped to receive only do not require licenses.

203. Operators of receiving stations do not require licenses, but all persons are required to maintain secrecy in regard to messages, as provided in the Act of August 13th, 1912, nineteenth regulation of section 4.

204. Distances under the radio laws are computed in nautical miles.

205. No fees are charged for any operator or station license.

206. Licensed stations must be operated by or under the direct supervision of properly licensed operators.

207. Amateur stations within five miles of naval or military stations need not have been in actual operation on or before August 13th, 1912, to obtain a license for a restricted amateur station.

208. The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radio telegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

209. The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

210. No person shall transmit or make a signal containing profane or obscene words or language.

211. Additional or amendatory regulations will be issued from time to time as they may appear necessary.

Radio Service Form 752.

CERTIFICATE OF RADIO INSPECTION. PORT OF

This is to certify that I have to-day examined the apparatus for radio communication on the s.s. _____, of which _____ is master, about to leave this port for _____, and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Radio Inspector.

(Or)

Customs Inspector.

Radio Service Form 753.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

NOTICE.

The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars. (Act of July 23rd, 1912.)

PORT OF

This is to certify that I have to-day examined the apparatus for radio communication on the S.S. _____, of which I am master, about to leave this port for _____, and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed) _____, Master.

No.

RADIO SERVICE FORM 753A. RADIO DECLARATION.

(To be submitted in duplicate.)

NOTICE.—“The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every

wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.”
—Act of July 23rd, 1912.

Port of _____

Date _____, 19__

This is to certify that the (nationality) _____ s.s. _____ of the (name of company or line) _____ of which I am master, entered this port on _____, 19__ having in crew (number) _____ persons and licensed or certificated to carry (number) _____ passengers; that the said vessel (is/is not) * equipped with radio apparatus as required by the Act of June 24th, 1910, as amended July 23rd, 1912; that the radio station is in charge of (number) _____ properly licensed radio operators and the apparatus is _____

Master or Agent.

in efficient/inefficient † condition.

This form should be filed in duplicate with the Collector of Customs at time of entry, who will furnish one copy to the radio inspector of the district on the date of entry in order that proper inspection may be made of the radio apparatus prior to the clearance of the vessel.

RADIO FORM 753B.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

NOTICE.—“The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.”
—Act of July 23rd, 1912.

CLEARANCE.

Port of _____

This is to certify that I have to-day examined the apparatus for radio communication on the (nationality) _____ s.s. _____

of which I am master, about to leave this port for _____, and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed) _____

Master.

LICENSE FOR GENERAL PUBLIC SERVICE COAST RADIO STATION.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

Pursuant to the Act to regulate radio communication, approved August 13th 1912, _____, a citizen of the State of _____

a company incorporated under the laws of the State of _____ having _____

* Strike out is or is not as the case may be.

† Strike out efficient or inefficient as the case may be.

applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) located in the State of _____ city or town of _____, for the purpose of transmitting to and receiving from ship stations and other land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and the citizens thereof, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The authority conferred by this license is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to regulate commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not willfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station during the hours of operation shall listen-in at intervals of not less than 15 minutes and for a period of not less than two minutes with the receiver tuned to receive messages of 300 metres wavelength.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other commercial station and with any ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Twelfth Regulation by the Act of August 13th, 1912.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Location: State, _____, County; _____; City or Town, _____ Street, _____; No. _____

Geographical location: Latitude, N. °. ' " Longitude, W. °. ' "

Specific hours authorised during which the station must be open to service (local standard time): _____

Power: Transformer input, _____ kw. Normal day range in nautical miles with ships at sea. _____

Time and method, if any, of sending time signals and hydrographic and meteorological radiograms: _____

Call letters. _____

_____; Coast charges: per word. _____ minimum per radiogram. _____

_____; Coast charges: per word. _____ minimum per radiogram. _____

_____; Coast charges: per word. _____ minimum per radiogram. _____

Radiotelegraphic system employed: _____

Characteristics of transmitting system:

Type of spark gap, _____

Approximate spark frequency, _____

Characteristics of receiving system:

Type of receiver, _____

Wavelength of receiving system: From _____ meters to _____ meters.

Antenna: Number of masts, _____; Height, _____

Type of aerial,
 Wires: Number,; Size and
 kind,
 Essential dimensions,

Sending wave-length.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

* Underscore normal.

The station insures rapid exchange with land wire stations of the

(Company.)

(Location telegraph office.)

(Company.)

(Location telegraph office.)

in the following manner:

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license will expire on the day of, 19..

Secretary of Commerce.

Commissioner of Navigation.

Washington, D.C. 19..

INSPECTIONS.

Date.	Inspector.	Remarks.

WAVELENGTHS.

The normal sending and receiving wave-length shall be metres, and no other wave-length shall be used for general public correspondence with any foreign ship or foreign coast station, except for long-range public service or purposes other than general public correspondence.

The station shall at all times, except as provided in the seventh paragraph of this license, be ready to receive messages of such wavelengths as are required by the International Radiotelegraphic Convention; shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions on the receiver shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

No. LICENSE FOR SHIP RADIO STATION. DEPARTMENT OF COMMERCE, BUREAU OF NAVIGATION, RADIO SERVICE.

L Pursuant to the Act to regulate radio communication, approved August 13th, 1912
 a citizen of the State of

For long-range public service and for any service other than general public correspondence the station is authorised to use the following additional wavelengths under 600 or over 1,600 metres:

Metres,; Metres,; Metres,
 Metres,; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

..... a company incorporated under the laws of the State of, having applied therefor, is hereby granted by the Secretary of Commerce for a period of

on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) on the

(Type of vessel.)

....., a vessel of the

(Name of vessel.)
 United States, official number, for the purpose of transmitting to and receiving from other ship stations and land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the International Agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and citizens thereof," and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The authority conferred by this license is subject to the provisions of the act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, except when in case of emergency the Collector of Customs by authority of the Secretary of Commerce shall issue a temporary permit, in lieu of a license, to the operator. The operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station shall be prepared to send the international signal of distress and distress signals on the normal wavelength designated by the International Radiotelegraphic Convention in force with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a ship station equipped with apparatus for sending and receiving equal in all essential particulars to the apparatus of the station herein licensed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use, except for sending signals of distress or signals and radiograms relating thereto, or when, owing to unusual circumstances, communication can be established only by means of an increase of power, a transformer input exceeding 1 kW., or exceeding $\frac{1}{2}$ kW. when within five nautical miles of a naval or military station.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Ship: Name,; Owner,; Home port,; International code letters,
 Radio call letters:
 Nature of service:
 Hours of operation:
 Power: Transformer input, kW.
 Primary source of power,
 Normal day range in nautical miles with other ships at sea,
 Ship charge: Per word,; Minimum per radiogram
 Per word; Minimum per radiogram
 Radiotelegraphic system employed:
 Characteristics of transmitting system:
 Type of spark gap,
 Approximate spark frequency,
 Characteristics of receiving system:
 Type of receiver,
 Wavelength range of receiving system:
 From metres to metres
 Antenna: Number of masts,; Height,
 Type of aerial
 Wires: Number,; Size and kind,
 Essential dimensions,
 Auxiliary apparatus: Type,
 Power: Source,; Normal day range with ships,

Sending wave-length.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

* Under score normal.

WAVELENGTHS.

The normal sending and receiving wavelength shall be 600 metres, and the station shall be prepared to use two sending wavelengths, one of 600 metres and one of 300 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

A wavelength of metres and the following additional wavelengths not exceeding 600 metres may be employed as authorised by law and treaty:

Metres,; Metres,; Metres,
 Metres,; Metres,; Metres,
 Metres,; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels

in distress and in sending distress signals when the transmitter may be tuned to create a maximum of interference with a maximum of radiation.

The station in general shall transmit its radiograms to the nearest coast station. The sender shall have the right, however, to designate the coast station through which he desires to have his radiograms transmitted, and his wishes shall be complied with only if the transmission can be effected without interfering with the service of other stations, or the shipboard station shall wait until such coast station shall be the nearest as provided by the International Convention in force.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license will expire on the
day of 19

[SEAL.] Secretary of Commerce,
Commissioner of Navigation.
Washington, D.C., 19

INSPECTIONS.

Date.	Inspector.	Remarks.

No.

LICENSE FOR LAND RADIO STATION.

Class

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

M Pursuant to the Act to regulate radio communication, approved August 13th, 1912, a citizen of the State of _____ a company incorporated under the laws of the State of _____, having applied therefore, is hereby granted by the Secretary of Commerce for a period of _____ on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) for the purpose of transmitting to and receiving from ship stations and other land stations public correspondence, Government and service correspondence, and distress signals and messages at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter, or for the purpose of conducting experiments for the development of the science of radio communication or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations, the purpose of the station being designated by the classification at the head of this license.

2. Public correspondence or limited commercial correspondence authorized by this license shall be limited to certain stations, ships or lines of ships named hereinafter, which designation is authorized in view of the nature of the service and is independent of the radio system employed.

3. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent Acts and treaties of the United States, in so far as they apply to the class of station indicated by this license.

4. The authority conferred by this license is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

5. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

6. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

7. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall not use a transmitter during the first fifteen minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Regulation 12 of the Act of August 13th, 1912.

10. The President of the United States in time of war or public peril or disaster is authorized by law to close the station and cause the removal therefrom of all radio apparatus, or may authorize the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

11. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

12. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Name of owner
Location: State,; County,
.....; City or town,
.....; Street,
No.

Geographical location: Latitude, N. $^{\circ}$
Longitude, W. $^{\circ}$

This station is licensed for communication only with the following land stations, ships, or lines of ships:

Specific hours during which the station must/may be open to service (local standard time):

Power: Transformer input, kW.
Normal day range in nautical miles,
Time and method, if any, of sending time signals and hydrographic and meteorological radiograms:

Call letters,
.....; Coast charges: per word
minimum per radiogram
.....; Coast charges: per word
minimum per radiogram
.....; Coast charges: per word
minimum per radiogram

Radiotelegraphic system employed,
Characteristics of transmitting system:
Type of spark gap,
Approximate spark frequency,

Wavelength range of receiving system:
From metres to metres.

Antenna: Number of masts,
Height,

Type of aerial,
Wires: Number,; Size and kind,
Essential dimensions,

WAVELENGTHS.

The normal sending and receiving wavelength shall be metres.

If the station be classified as a coast station, it shall be prepared to transmit or relay distress calls or messages using the distress wavelength as provided by the International Radiotelegraphic Convention in force.

In view of special conditions the station is authorised to use for communication exclusively with stations licensed by the United States the

following additional wavelengths under 600 or over 1,600 metres:

Metres,; Metres,; Metres,; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

The station insures rapid exchange with land wire stations at

(Company.)

(Location telegraph office.)

Sending wavelength.	Antenna current (amperes).	Logarithmic decrement.
300 metres		
600 metres		
metres		
metres		
metres		

(Company.)

(Location telegraph office.)

in the following manner:

This license will expire on the day of....., 19..
[SEAL OF DEPARTMENT OF COMMERCE.]

Secretary of Commerce.
Commissioner of Navigation.
Washington, D.C.,19..

INSPECTIONS.

Date.	Inspector.	Remarks.

LICENSE FOR (General or restricted) AMATEUR RADIO STATION.

DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

N Pursuant to the act to regulate radio communication, approved August 13th, 1912, a citizen of the State of having applied therefor, is hereby granted by the Secretary of Commerce, for a period of year, on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said station is located: *Provided*, That no interference other than may result

under the restrictions contained in this license shall be caused with the radio communication of stations of the Government of the United States or licensed stations.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the transformer input shall not exceed $\frac{one}{one-half}$ kilowatt.*

6. The station shall not use a transmitting wavelength exceeding 200 metres.

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the Act of August 13th, 1912.

8. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector or other duly authorised officer of the Government.

SCHEDULE OF STATIONS AND APPARATUS.

Name of owner, Age,
Location: State,
.....; County,
City or town,; Street,
No. Official call,
Name of naval or military station, if within five nautical miles,
Power: Transformer input, W.†

* Strike out "one" if the station be within five nautical miles of a naval or military station; otherwise strike out "one-half."

† Not to exceed 1,000; or if the station be within five nautical miles of a naval or military station, not to exceed 500.

Antenna: Type (T, J, fan, umbrella, etc.),

Height,

Horizontal length,

(Above ground.)

Wires: Number in vertical part,

In horizontal part,

The normal sending and receiving wavelength shall be metres and the

(Not exceeding 200.)

station is authorised to use the following additional wavelengths, not exceeding 200 metres: metres, metres.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license expires on 19..

C. H. HUSTON,

Assistant Secretary of Commerce.

E. T. CHAMBERLAIN,

Commissioner of Navigation.

Delivered by

(Radio inspector.)

Place,

Date, 19.... No....

THE UNITED STATES OF AMERICA.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

LICENSE TO RADIO OPERATOR, COMMERCIAL EXTRA FIRST CLASS.

This is to certify that
O has been examined and passed,
pursuant to the Radiotelegraphic
Convention, in

(a) adjustment, operation and care of
apparatus;

(b) transmitting and sound reading at a
speed of words a minute,
Continental Morse, and words
a minute, American Morse;

(c) use and care of storage battery or
other auxiliary;

(d) knowledge of international regulations
and Acts of Congress to regulate radio
communication;

(e) knowledge of United States Naval
Radio Regulations;

and is hereby licensed, as required by law,
Radio Operator, Commercial Extra First
Grade, for two years.

In testimony of trustworthiness and efficient
service as Radio Operator for
months, of which months were
service at sea, and of superior knowledge
and skill, ascertained by special examination
this extra grade license is granted.

..... Oath of Secrecy executed.
(Examining Officer.)

Secretary of Commerce.

(Title)

Notary Public.

Commissioner of Navigation.

Place Date 19....

This license is not valid until the following
oath has been executed:—

I, do solemnly
swear that I will faithfully preserve the secrecy
of all messages coming to my knowledge through
my employment under this license; that this
obligation is taken freely without mental

reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

(Signature of holder.)

Date of birth,
Place of birth,
Sworn to and subscribed before me this,

day of..... A.D. 19....

.....
Notary Public.

SEAL

SERVICE RECORD.

This is to certify that the holder of this license has served satisfactorily as radio operator under my orders during the period named.

Name of Ship or Land Station.

Period

Master, Manager, or
Superintendent.

[illegible]

Operators must have the service record on the backs of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION,
LICENSE TO RADIO OPERATOR,
COMMERCIAL* CLASS.

P This is to certify that
has been examined and passed, pur-
suant to the Radiotelegraphic Con-
vention, in

(a) Adjustment, operation and care of apparatus:

(b) Transmitting and sound reading at a speed of not less than $\frac{1}{4}$ words a minute, Continental Morse;

(c) Use and care of storage battery or other auxiliary:

(d) Knowledge of international regulations and Acts of Congress to regulate radio communication;

and is hereby licensed as required by law a Radio Operator, Commercial * grade for two years. The candidate's practical knowledge of adjustment was tested on a set of apparatus. His knowledge of other systems is shown below.

* First or Second. † Twenty or Twelve.

HERBERT HOOVER.

Secretary of Commerce.

.....Oath of Secrecy executed.
(Examining Officer.)

E. T. CHAMBERLAIN.

Commissioner of Navigation.

(Title.) *Notary Public.*
 Place Date, 19...

This license is not valid until the following oath has been executed:—

I, do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

(Signature of holder.)

Date of birth,
Place of birth,
Sworn to and subscribed before me this
day of A.D. 19....

.....
Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this license has served as radio operator under my orders during the period named.

Name of Ship or Land Station.

Period.

Master, Manager or
Superintendent.

[illegible]

Operators must have the service record on the backs of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.

LICENSE TO RADIO OPERATOR,
AMATEUR FIRST GRADE.

Q This is to certify that has been examined and shown to have a knowledge of the adjustment and operation and of the regulations of the Radio telegraphic Convention and the Acts of Congress in so far as they relate to interference with radio communication and impose certain duties on all grades of operators sufficient to entitle him to a license, and he is hereby licensed as required by law Radio Operator, Amateur First Grade for two years.

The candidate was examined and shown to have knowledge (excellent or good) in the following additional subjects:

- (a) General adjustment, operation and care of apparatus †.....;
- (b) Transmitting and sound reading Continental Morse at a speed of § words a minute;
- (c) General knowledge of international

* Excellent or good. † Insert speed.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on the back of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

LICENSE TO RADIO OPERATOR,
AMATEUR SECOND GRADE.

R This is to certify that has presented satisfactory evidence that he has a knowledge of the adjustment and operation of apparatus and of the regulations of the Radiotelegraphic Convention and the Acts of Congress, in so far as they relate to interference with radio communication and impose certain duties on all grades of operators, sufficient to entitle him to a license, and he is hereby temporarily licensed as RADIO OPERATOR, AMATEUR SECOND GRADE, for the period of eight months or until he has been duly examined.

regulations and Acts of Congress to regulate radio communication †.....
..... Oath of Secrecy executed.
(Examining Officer.)
.....
(Title.) Notary Public.

Place....., Date....., 19....
HERBERT HOOVER,
Secretary of Commerce.
E. T. CHAMBERLAIN,
Commissioner of Navigation.

This license is not valid until the following oath has been executed:—

I,.....do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

(Signature of holder.)

Date of birth,
Place of birth,
Sworn to and subscribed before me this.....
day of..... A.D. 19....

SEAL. Notary Public.

SERVICE RECORD.

This is to certify that the holder of this license has served as radio operator under my orders during the period named.

He has shown that he has knowledge (excellent or good) of the following additional subjects:

- (a) General adjustment, operation, and care of apparatus.....
(Excellent or good.)
- (b) Transmitting and sound reading Continental Morse at a speed of words a minute.
- (c) General knowledge of international regulations and Acts of Congress to regulate radio communication.....
(Excellent or good.)
- Oath of Secrecy executed
(Certifying Officer.)

(Title.) Notary Public.
Place....., Date....., 19....
HERBERT HOOVER,
Secretary of Commerce.
E. T. CHAMBERLAIN,
Commissioner of Navigation.

I, do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my operations under this license; that this obligation is taken freely, without mental reservation or purpose of evasion; and that I will well and faithfully observe the obligation of a licensed radio operator: So help me God.

(Signature of holder.)

Date of birth,
Place of birth,
Sworn to and subscribed before me this,
day of A.D. 19..

Notary Public.

SEAL.

NOTICE TO BERNE BUREAU.

S The Minister of Marine of the United States of America has notified to the Berne Bureau that the following information is to be published:—

1. The Departments of the United States Government which are concerned with wireless telegraphy regret that they have not yet been able to make arrangements with the land telegraph of the United States owing to the fact that these are in the hands of commercial companies, and have nothing to do with the Government. The idea was to arrange for the free transmission over the land telegraph, in accordance with Article 14, paragraph 2, of the Rules of Service of the London Convention. The information to be transmitted free of charge was all such as related to the date and the hour of the handing in of radio-telegrams on board ship. But the transmission of such information over land lines being subject to a tax, the Government of the United States cannot, at present, conform strictly to this rule of the Convention. The declaration of the American delegation contained in Article 2 of the Final Protocol made provision for such a possible outcome, although its exact nature was not actually set forth.

2. Multiple radiotelegrams, such as are mentioned in article 38, paragraph 5, of the Rules of Service, will be accepted as multiple messages in all wireless transmission between ship and shore stations, but all the companies operating land telegraph lines in the United States will consider, and will charge for, a multiple wireless message as consisting of so many individual telegrams as the addresses it bears may indicate.

3. The United States is not a member of the International Telegraphic Union and consequently is not bound to execute the rules laid down in Article 38, paragraph 8, of the London Convention Rules of Service concerning urgent radiotelegrams. The laws of the United States regulating all reciprocal arrangements between the States forbid the use of the privilege, and consequently all telegraph companies will not allow any priority in favour of telegrams for which any additional tax may have been paid.

T An Act to authorise the President of the United States to arrange and participate in an international conference to consider questions relating to international communication.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is

hereby, requested and authorised in the name of the Government of the United States to call, in his discretion, an international conference to assemble in Washington, and to appoint, by and with the advice and consent of the Senate, representatives to participate therein, to consider all international aspects of communication by telegraph, telephone, cable, wireless telephone, and wireless telegraphy, and to make recommendations with a view to providing the entire world with adequate facilities for international communication on a fair and equitable basis.

SEC. 2.—That the sum of \$75,000, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, the same to be disbursed under the direction and in the discretion of the Secretary of State for expenses incidental to the conference, including personal services in the District of Columbia notwithstanding the provisions of any other Act: Provided, That no part of said sum shall be used in entertainment or for the purchase of medals and badges.

Approved, December 17th, 1919.

U. S. RADIO COMPASS STATIONS.

U (See under U.S.A. in Direction Finding Section)

PUBLIC RESOLUTION:

No. 48—66TH CONGRESS.

V Joint Resolution to authorise the operation of Government-owned Radio Stations for the use of the general public, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled: That all land, ship and airship radio stations, and all apparatus therein owned by the United States may be used by it for receiving and transmitting messages relating to Government business, compass reports and the safety of ships.

SEC. 2. That the Secretary of the Navy is hereby authorised, under terms and conditions and at rates prescribed by him, which rates shall be just and reasonable, and which, upon complaint, shall be subject to review and revision by the interstate Commerce Commission, to use all radio stations and apparatus, wherever located, owned by the United States and under the control of the Navy Department—(a) for the reception and transmission of press messages offered by any newspaper published in the United States, its territories or possessions, or published by citizens of the United States in foreign countries, or by any press association of the United States, and (b) for the reception and transmission of private commercial messages. Provided: That the rates fixed for the reception and transmission of commercial messages, other than press messages, shall not be less than the rates charged by privately-owned and operated stations for like messages and service: Provided further, That the right to use such stations for any of the purposes named in this section shall terminate and cease as between any countries or localities or between any locality and privately operated ships, whenever privately owned and operated stations are capable of meeting the normal communication requirements between such countries or localities or between any locality and privately operated ships, and the

Secretary of Commerce shall have notified the Secretary of the Navy thereof, and all rights conferred by this section shall terminate and cease in any event two years from the date this resolution takes effect.

Sec. 3. That all stations owned and operated

by the Government, except as herein otherwise provided, shall be used and operated in accordance with the provisions of the Act of Congress entitled "An Act to regulate radio communication," approved August 13th, 1912.

Approved, June 5th, 1920.

URUGUAY

(See also Map Section)

THE independence of the Republic of Uruguay, originally part of the Spanish Viceroyalty of Rio de la Plata, and later on a Province of Brazil, was declared on August 25th, 1825, and recognised by Treaty on August 27th, 1828. The constitution was sworn on July 18th, 1830, and reformed in January, 1918. Legislation is administered by a Parliament of two Houses, the Executive being in the hands of a President elected every four years, and a National Administrative Council composed of nine members. The total area of the 19 departments into which the country is divided is estimated at 72,153 square miles with a population of 1,494,953. The capital city is Montevideo, situated on the northern bank of the River Plate Estuary.

CONTROL.

Wireless telegraphy in Uruguay is controlled by the Government, the department in charge being the Ministry of War and Marine. The Government ship stations are also under the control of the Minister of War and Marine. There are no privately owned stations. There are no radiotelegraphic clubs or societies, in fact wireless telegraphy is entirely a Government monopoly.

ORGANISATION.

The installation of wireless telegraphy in Uruguay was authorised by a Government Decree dated June 22nd, 1910. This Decree provided for one long-distance station at Montevideo, minimum range 500 miles; two situated respectively at Paso de los Toros and Rivera (Northern Frontier), with minimum range of 372 miles; two respectively situated at Lobos Island and the English Bank, each with minimum range of five miles; besides installations on the various Government vessels. By the end of the year 1911 the service (supplemented by two Military Field Stations) was in working order.

The Montevideo station, opened to the public in December, 1911, and standing on a hill three miles from the river, is the only installation doing international work. Its location is called Cerrito de la Victoria, and the wireless station generally goes by the name of "Cerrito." The installations situated at Rivera and Paso de los Toros are employed solely for military purposes, and only in times of crisis, should a breakdown of the ordinary wired service eventuate, are they used for public messages.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Arturo Gaye ..	Acting <i>pro tem.</i> , as Minister for War	Montevideo
Sr. Bernardo Kay ..	Engineer Inspector-General. . .	Calle Pereira 74, Montevideo
Sr. Juan P. Camera	Secretary	Calle Ituzaingo 1278, Montevideo
Lieut.-Col. Carlos Du	Chief of Montevideo Station	Montevideo
Pre	(Cerrito)	
Sr. Cesar y Vidal	Chief of Paso de los Toros Station	Paso de los Toros
Pineiro ..		
Sr. Gualberto Oriel	Chief of Rivera Station	Rivera

ADMINISTRATION.

The first Decree regulating the subject was issued by the Ministry of War and Marine on September 5th, 1911, and was followed by a decree dated January, 1912. Under its provisions *all ships calling at the ports of the Republic and destined for passenger service are obliged to be fitted with wireless apparatus.*

We print here the text of both the Decrees above referred to:—

A—Decree of September 5th, 1911.

B—Decree of January, 1912.

C—Decree replacing the Superior Decree of October 20th, 1914, with the Superior Resolution of November 14th, 1919.

DECREE OF SEPTEMBER 5TH, 1911.

A 1. The National Wireless Telegraphy Office is under the direct control of the Ministry of War and Marine, with the Engineer Inspector-General as its head.

2. The National Wireless Telegraph Office is in charge of and controls all the radiotelegraphic stations, whether fixed or military movable ones, on vessels or on lighthouses, together with their staff, apparatus and installations.

3. The Inspector-General will at such times and under such circumstances as he thinks proper make visits of inspection of the stations in order to take personal cognisance of their requirements, and he exercises in regard to the staff, whether military or civil, the character of a staff commander.

4. On the occasions of manœuvres the Inspector-General will designate the country stations which are to take part in accordance with the instructions he receives as to the requirements of the occasion.

5. It is one of the duties of the National Wireless Telegraph Office to propose to the superior department the construction of fresh stations and to report regarding the means for acquiring the same.

6. The Inspector-General controls the sums received for transmission of telegrams, which sums shall be deposited in the Bank of the Republic to the order of the Minister of War and Marine.

7. The National Wireless Telegraph Office will make contracts with the General Post and Telegraph Office and with the shipping companies to be submitted for approval to the Minister of War and Marine; similarly the office is empowered to draw up with the administrations of the neighbouring States radiotelegraphic agreements with the object of improving and amplifying the international wireless telegraph service, all of which shall be submitted for approval by the higher department.

8. The Minister of War and Marine will notify the International Office in Berne of the creation of the National Wireless Telegraph Office in Uruguay, so that in future all questions concerning wireless telegraphy in Uruguay may be referred direct to it.

9. The Inspector-General will report quarterly to the Minister of War and Marine regarding the general conditions and working of the service under his charge, and will compile an annual memorandum upon the general work of his department.

DECREE OF JANUARY, 1912.

B 1. Commencing from May 1st of the present year (1912) all the ships carrying passengers between the harbours of the Republic and those of foreign countries shall be fitted with radiotelegraph installations.

2. The said installations shall be designed to receive and transmit telegrams up to a distance of not less than one hundred kilometres on the ships of river navigation, and four hundred kilometres on those of the oceanic navigation.

3. The installations shall be permanently kept in good conditions of working, and capable of intercommunicating with the stations of the Republic.

4. The stations shall be in charge of persons well acquainted with the use of radiotelegraph apparatus.

5. The service of the stations shall be entirely in accordance with the provisions of the International Radiotelegraph Convention.

6. The agents of the companies will inform, before expiration of the time fixed, the General Inspector of the National Service of Wireless Telegraphy of the characteristics, system, power, etc., of the radiotelegraph apparatus to be fitted on the ships of their companies.

7. The ships which after expiration of the time fixed by Article 1 have not complied with the provisions of this Decree shall not be authorised to carry passengers in the harbours of the Republic.

8. Those ships which do not keep their wireless apparatus in proper working conditions shall be liable to have applied to them the penalty specified in the previous article (7).

9. The General Inspector of the National Service of Wireless Telegraphy is hereby entrusted with seeing that the provisions of this Decree are duly complied with.

C ART. 1.—The Superior Decree of October 20th, 1914, referring to installations of Wireless Telegraphy in this country, as also the modifications made to same contained in the superior resolution of November 14th, 1919, have been cancelled.

ART. 2.—It is allowed to install complete radiotelegraphic and radiotelephonic stations or receiving stations only in the territory of the Republic, except in places where Government stations are installed, nor at a distance of under 50 kilometres from the River Plate or the frontier with Argentina when not in towns of any

importance. The radiotelegraph stations merely for study and those of radiotelephonic which cannot be used for telegraphy can also be installed in places where Government stations exist.

ART. 3.—The installation and working of the radiotelegraphic stations authorised by the aforementioned article will be subject to the following conditions :—

(a) In every case when installing a station, if it be in the Department of Montevideo, the person interested must previously communicate in writing to the General Inspection of Wireless Telegraphy the following data :— Use for which it is destined, class and system of same with specification of power in the antenna and origin of energy with which it will work, class of antenna, height and length of same, place where it will be installed and name of the proprietor, forwarding also a diagram or plan with a memorandum describing the projected installation. In other departments the aforementioned communication should be made to the respective military authorities or to the Chief of Police, who will have it forwarded to the General Inspection of Wireless Telegraphy and there being no observations to be made the data will be noted in the register, a serial number will be allotted and the wavelength with which it may work will be fixed ; installation may then be commenced and when it has once been inspected and tested, communication can be commenced.

In the case of a Receiving Station the person interested will communicate to the corresponding authorities in accordance with the aforementioned giving in such an event only the details which may be requested from him.

(b) They may only be destined for private use or for study, it being absolutely prohibited to carry on a public service or to exploit it in any way.

(c) They will be used exclusively for the communications in the country and may not have a larger range than 20 kilometres for studying purposes, and all others not over 100 kilometres if there be any Government station in that radius and up to 200 kilometres if no such station exists, and all these must only work with the wavelength approved for them.

(d) The stations which are not for private use or purely for reception can only be worked by persons having a license as operators at least of the third-class, issued by the General Inspection of Wireless Telegraphy.

(e) To send messages to parts where there are Government stations all transmission must be made to these stations, payment being made at half the tariff rate for messages.

In no case must an installation be made at a shorter distance from those of the Government, as follows :—In Montevideo : for study, 2 kilometres, and all others at 10, and in the interior at one and five respectively.

(g) In addition to the preceding conditions, the stations will be subject to the dispositions and existing or future regulations for telegraphy, wireless or otherwise, and in the event of these regulations not being followed or when the Government so desires, they can be closed by the respective authorities, and the proprietors can have no right to claims or indemnifications whatsoever.

ART. 4.—For the installation and working of radiotelephonic stations which can also communicate radiotelegraphically, the aforementioned conditions will be observed, and for those only radiotelephonic, the following :—

(h) They can be employed for private or business purposes, as also for public use, for study, educational, information, commercial, meteorological, advertising, concerts and, in general, everything in connection with intellectual instruction or of general interest.

(i) When they are employed for the preceding purposes, that is, for commercial or exploitation purposes, the person interested must previously apply in writing to the Ministry of War and Marine for the technical authorisation corresponding to the installation of the station or stations which will be used for the said purposes, and there must be given in the respective application the same information as is required in (a) of Art. 3 of this Decree. The Ministry of War and Marine will pass it to the General Inspection of Wireless Telegraphy who, if they have no technical observations to make, will note down the characteristics in the respective register, will allot it a serial number and will then forward to the petitioner a certificate of authorisation for the requested installations.

(j) For the exploitation authority which must come after the technical authorisation, those interested must apply to the corresponding Ministry in accordance with existing or future regulations to that effect.

(k) The installation of stations not destined for exploitation purposes as also for those of study or solely receiving stations, will come under the regulations in (a) of Art. 3, with the difference that the wavelength of working will be determined by the respective authorities.

(l) The General Inspection of Wireless Telegraphy will put at the disposal of the Directorate-General of Posts, Telegraphs and Telephones the bands of wavelengths destined for the use of private radiotelephonic stations, and will reserve those corresponding to the Government stations.

(ll) The stations destined for exploitation must be attended by native operators who must hold a first-class professional certificate, issued by the General Inspection of Wireless Telegraphy. These stations may not operate without having been inspected previously by the aforementioned authorities, and who may also inspect the working of same if they deem it necessary.

(m) Radiotelephonic communications can be made at any distance within the country, but for the exterior only up to 50 kilometres, with the exception of those made from the Capital of the Republic, and if for ships can be made up to a distance of 100 kilometres, and if for other parts up to 250 kilometres. When the State possess their own stations, distant communications for the exterior and interior must be made by said stations. In every case the wavelengths authorised by the authorities only will be used, and the Cerrito Station or others that may be available in future will be directed to control them and at the same time to see that the said communications conform to the regulations in force.

(u) In addition to the preceding established conditions the working of the stations will be subject to the existing and future regulations on wireless or other telephones as far as applicable, and in the event of the regulations not being adhered to, the said authorisation can be taken away and the stations closed by the authorities as deemed convenient and the proprietors shall have no claim to indemnification whatsoever.

ART. 5.—Ships carrying the National flag may install radiotelephonic stations, subject to the same regulations as above stations and they must also conform to any international conventions subscribed by this country.

ART. 6.—The General Inspection of Wireless Telegraphy will be in charge of watching and controlling by means of their own stations, the observation of the proper compliance with all the regulations of this Decree, and all operators of wireless telegraphy must comply with and obey any professional direction relating to the service, which may be made by the Government's stations, which shall always have preference in the transmission of any communications.

ART. 7.—Communicate, etc.

URUGUAY, BOLETIN OFICIAL.

August 14th, 1922.

VENEZUELA

(See also Map Section)

THE Republic of Venezuela was formed in 1830 by secession from the other members of the Republic of Colombia. The Constitution in force is that of June 13th, 1914. Legislative authority is vested in a Congress of two Chambers, whilst the Executive power is exercised by a President in conjunction with Cabinet Ministers. The twenty states, two territories and one Federal district of which it is composed cover an area of 398,594 square miles with a population of 2,411,952.

The territory included under the Administration of Venezuela is the same as that which was known, at the time South America was a Spanish colony, as "Capitania General de Venezuela," and extends from British Guiana on the east to the Republic of Colombia on the west. Its northern boundary is the Caribbean Sea, and its southern boundary the Republic of Brazil. There are included in the Venezuelan territory many islands in the Caribbean Sea, the principal being Margarita, Cubagua, Los Roques, Coche, Tortuga.

CONTROL AND ORGANISATION.

Radiotelegraphy in Venezuela is controlled by the Government, the Department in charge being the Ministerio of Fomento assisted by the Director of Federal Telegraphs and Telephones.

There are no privately owned Radiotelegraph stations, neither Clubs or Societies.

The Ministerio has granted permission to several Oil Exploration Companies to erect Radiotelephone stations to communicate from the oilfields to the offices, but no such station has yet been erected.

There exist at present eight stations in the different parts of the country, each open for public service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Antonio Alamo ..	Minister of Public Works..	Caracas
Gral. Julio Hidalgo ..	Director-General of Federal Telegraphs and Telephones	Caracas.
Dr. H. R. von Eichwald	Chief of Radio Communication ..	Caracas.
Lieut. Antonio Toro Key	Director of National Radio School ..	Caracas.

The plan adopted to erect a Radio station in the Capital of each State is still under consideration, as is also the erection of a high power Radio station to work with Europe and the United States of America.

The last named service is actually carried out via Trinidad (VPL) messages being accepted to any part of the world and forwarded via Radio to Trinidad and then by cable. The charges of one bolivar and twenty-five centimos being equally divided between the two stations.

There also exists by decree, dated July 23rd, 1921, a National School of Radiotelegraphy, an Institution destined to provide the country with native operators for the service. The school is directed by Lieut. Antonio Toro Key, who returned some months ago from the United States of America, where he had been sent by the Government in order to gain instruction and experience in the art of Radiotelegraphy.

ADMINISTRATION.

The laws and regulations relating to wireless telegraphy and telephony are contained under the following :—

A—Radiotelegraphic Regulations.

B—Instructions for Radio Telegraphic Stations.

DOCTOR V. MARQUEZ BUSTILLOS,

Provisional President of the Republic,

in virtue of Clause 10 of Article 79 of the National Constitution

A DECREES THE FOLLOWING RADIOTELEGRAPHIC REGULATION. HEADING No. 1.—PRELIMINARY CONDITIONS.

ART. 1.—Wireless telegraphy or radiotelegraphy in Venezuela will be governed by the Law of Telegraphs and Telephones, by the International Radiotelegraphic Convention, by the other special conventions made in respect thereto, by the conditions of the present Decree, and by others that may be prescribed.

ART. 2.—Pre-eminent control and administration of radiotelegraph installations will be in the hands of the Ministry of Public Works; but if the Federal Executive should desire it, they can in war time be placed under the direction of the War Office and Admiralty.

ART. 3.—The National territory is divided into two zones, subject to regulation and jurisdiction. The maritime zone comprises the territorial waters of the Republic, including the navigable rivers. The terrestrial zone embraces all the other installations erected within the Venezuelan territory, including islands, shores and banks.

ART. 4.—With the exception of National or foreign warships, no ship which is anchored may use its radiotelegraph installations, while it is not sailing, unless justified by reason of urgency.

ART. 5.—According to their purpose, radiotelegraph stations are divided as follows:—1st, central station; 2nd, local stations; 3rd, training stations; 4th, portable stations.

ART. 6.—Only the National Government may possess radiotelegraph stations in the terrestrial zone of Venezuela. Private people may be able to use them, subject to the ruling conditions and tariffs.

ART. 7.—All National or foreign merchant vessels carrying more than fifty passengers on an ordinary voyage, whether they put in or anchor at Venezuelan ports, must be in possession of a wireless telegraph installation in perfect condition, and another emergency installation besides, which can work for at least six hours, and be set quickly to work in case of the former apparatus getting out of order in times of danger.

ART. 8.—Boats excepted by the International Conventions and those exclusively devoted to coast navigation through National territorial waters are exempted from carrying wireless installations.

Boats which are exempted from the said obligation may not possess radio installations without previous permission from the Federal Executive.

GENERAL CONDITIONS.

FIRST SECTION.

Signals and Radiotelegraphic Waves.

ART. 9.—The exchange of signals, superfluous words, experimenting or practising that may in any way interrupt radiotelegraphic correspondence is forbidden at ordinary stations.

ART. 10.—The normal length of a wave will be 600 metres. Training and portable stations shall use a smaller one, to be fixed for them, so as not to interfere with ordinary communications.

ART. 11.—Permission is given in exceptional circumstances for other wavelengths to be used in accordance with the limits of the International Regulations.

ART. 12.—The signs used for radiotelegraphic communications will be those of the International Morse alphabet.

ART. 13.—Ships in distress will use the sign adopted by the International Conventions.

ART. 14.—As soon as a station hears danger calls, it shall suspend all correspondence and not resume it until after having made certain that the communication of danger has been concluded; it shall attend to the calls wherever there origin may be, and answer them; it shall in conformity with the notifications from the ship communicate with the authorities of the respective littoral.

ART. 15.—In radio communications between coast and ship stations the call, pauses and inquiries noted in the Regulation annexed to Radiotelegraphic Convention, signed in London on the 5th July, 1912, shall be observed; this will not prevent the use of others for interior service, but in this case the use of those universally adopted signals that might cause confusion is strictly forbidden.

SECOND SECTION.

(*r*) *Personnel of the Radiotelegraph Service.*

ART. 16.—The Director-General of Telegraphs and Federal Telephones will be the head of the radiotelegraph stations in everything concerning the service. Anything relating to the inspection and working of the installations, complaints, fulfilment of regulations and application of penalties is included in his duties which he shall exercise direct, giving an account of each case to the Ministry of Public Works.

ART. 17.—For the supervision of installations, the Ministry of Public Works may appoint inspectors of radiotelegraphy, with jurisdiction over a particular littoral.

ART. 18.—The radiotelegraphic service of each installation shall be performed by an operator who holds a first-class efficiency certificate. The latter includes,—

- (a) A knowledge of the apparatus and of their arrangement and working;
- (b) A capacity for transmitting and receiving audibly at a minimum speed of twenty words a minute;
- (c) A knowledge of the International Regulations, local laws and regulations compulsorily applicable to the service and exchange of radiotelegraph communications.

ART. 19.—In exceptional cases, when the service has to be entrusted to an operator who has only a second-class certificate, the latter must guarantee the same efficiency as a first class, except in regard to speed transmission and reception capacity, which must never be less than twelve words a minute.

ART. 20.—The duties of bookkeeping and filing at radiotelegraph stations are under the charge of the operator and the Exchequer of Federal Telegraphs and Telephones.

ART. 21.—Radiotelegraph stations, according to their importance and local regulations, shall be worked by a requisite subordinate staff in accordance with the dispositions of the Ministry of Public Works, for dealing effectively with the service.

ART. 22.—Radiotelegraph stations shall be connected with the National Telegraph system.

Radiograms may be handed in at ordinary telegraph offices for transmission by wire to the stations. In these cases the receiving clerk must make separate bookkeeping entries.

(b) *School of Radiotelegraphy.*

ART. 23.—The School of Radiotelegraphy is an institution for educating the technical staff of the Republican radiotelegraph and radiotelephone stations.

ART. 24.—The Director-General of Telegraphs and Federal Telephones, the Head Professor and a language Professor will constitute the personnel of the school.

ART. 25.—The Director-General of Federal Telegraphs and Telephones shall exercise control over the school and see that it is well conducted, notifying the Ministry of Public Works every time amendments are necessary or suitable improvements might be adopted.

ART. 26.—The Head Professor, who is immediately subordinate to the Federal Director-General of Telegraphs and Telephones, shall deal with the organisation and working of the institution, and shall besides give instruction on the subjects necessary for the course of training, and in accordance with the programme of studies which he shall elaborate and submit for approval to the Ministry of Public Works.

ART. 27.—The Language Professor shall give pupils the special instruction desired and do his best besides to assist in the good management of the school.

ART. 28.—To be admitted as a pupil in the school the following is necessary:—

- (a) To be over eighteen and under thirty-five years of age;
- (b) A holder of a high grade certificate of instruction;
- (c) To be known to be of good conduct;
- (d) A holder of a certificate from the National Health Office certifying good health;
- (e) Written permission from a legal representative in the case of minors.
- (f) To request registration in a legal form within the prescribed time before the opening of a term. The request shall be addressed to the Minister of Public Works and shall be accompanied by the confirmation that the other requisites herein mentioned are complete.

ART. 29.—The number of pupils that will form a radiotelegraphic course shall in every case be fixed by the Ministry of Public Works.

ART. 30.—Nobody can be appointed to take an operator's position in the Republican Radiotelegraph of Radiotelephone Service who has not obtained a diploma for efficiency.

ART. 31.—In order to obtain the diploma referred to in the previous Article it is necessary to have gone through a course at the School of Radiotelegraphy in the subjects contained in the schedule of studies and to have passed the requisite examination satisfactorily, which shall consist of three divisions:—

- (i) A half an hour's oral test on subjects taken by ballot from the programme which shall be done by numbering slips from one upwards to the number of subjects contained in the programme.
- (ii) To draw up in fifteen minutes a document of the service proposed by the Examining Board.
- (iii) Transmitting and receiving practice for fifteen minutes. In no case will a candidate be approved who has not executed a speed minimum of twelve words a minute.

ART. 32.—The optional examinations for the diploma are always individual ones, and can be arranged at any time on the date fixed by the Ministry of Public Works, in accordance with the request which the candidate must make in legal form, which must bear at the foot thereof the certificate issued by the Director of the School, stating that the candidate has attended the course regularly, been punctual for the classes and done the tasks required in accordance with the schedule of studies.

ART. 33.—If the candidate should be approved, besides the diploma a certificate will be sent him, a first-class one if the transmitting and receiving speed is a minimum of twenty words a minute, and a second-class one if the speed varies between twelve and nineteen words a minute.

ART. 34.—The examining boards for the diploma shall consist of five members: the Director-General of Federal Telegraphs and Telephones, the Head Professor of the School of Radiotelegraphy and three technical specialists, preferably chosen from first-class operators.

THIRD SECTION.

RADIOTELEGRAPHIC SERVICE, OFFICIAL AND PRIVATE.

I.—*Order and Preference.*

ART. 35.—The radiotelegraph service is intended chiefly for commerce and private people. Only when it is a question of messages

sent by the President of the Republic or by the Commander-in-Chief of the National Army, in case of interruption of the ordinary lines or on matters of distinct urgency may the wireless telegraph of the terrestrial zone be used for official communications.

ART. 36.—Radiograms shall be despatched in the following order :—

- (a) Official service, and this will be according to the rank of the sending official.
- (b) Private radiograms in the order in which they are handed in.

ART. 37.—Radiograms referred to in Article 13 shall have absolute priority.

II.—Free Traffic.

ART. 38.—Radiograms will be free that are sent on service matters by officials authorised by the Law on Telegraphs and Telephones of the 20th June, 1918.

ART. 39.—Free traffic is not exempt from the supplementary taxes of ships and other foreign stations that have to handle the communications.

ART. 40.—The right to send a reply free of charge is proved by the presentation of the official radiotelegram or telegram requiring it.

III.—Tariff.

ART. 41.—The radiotelegraphic charge will be :—

I.—For Interior Service.

- (a) *Radiotelegraphic charge, properly so-called* at the rate of B. 0.25 a word with a minimum of ten words for every radiogram.
- (b) *Telegraphic or postal charge*, or both, according to the means of communication to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

II.—For Exterior Service.

- (a) *Radiotelegraphic charge properly so-called* at the rate of B. 0.60 per word, with a minimum of ten words for every radiogram.
- (b) *Coast or ship tax* of the station or ship to which the radiogram is sent according to the special tariff for same.
- (c) *Telegraphic or postal charge*, or both, according to the means of communication that may have to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

Sole paragraph. *In the radiotelegraphic charge properly so-called* the address and signature will be collected both for interior and exterior service.

IV.—Secrecy.

ART. 42.—All legal dispositions relating to keeping correspondence secret shall be applied to radiotelegrams.

ART. 43.—Only the President of the Republic, the Commander-in-Chief of the National Army, the Ministers of the Interior, the Governor of the Federal District and National Diplomatic Ministers or foreign residential ones may send or receive messages in code without any restriction.

ART. 44.—Subordinate employees will also be allowed to send cypher radiograms when dealing with a reply so required by their superiors mentioned in the foregoing Article.

ART. 45.—In International communications private people may for the purposes of economy

use ordinary well-known telegraphic codes ; but in every case the translation of the message must be attached so that it can be filed with the original radiogram.

HEADING No. III. SPECIAL CONDITIONS. FIRST SECTION.—PENALTIES.

ART. 46.—Breaches of the present Regulations will be punished by fines from 100 to 20,000 bolivares, which will be applied by the Director of Federal Telegraphs and Telephones, or imprisonment in proportion. In the event of their being guaranteed these fines will be subject to appeal before the Ministry of Public Works.

ART. 47.—The possession or use of clandestine radio electrical installations will be punishable by fine up to 20,000 bolivares and also by Government confiscation of apparatus and instruments : without prejudice to a prosecution that might be taken up, when besides infringing these conditions the fact constitutes an offence against the security of the State or the Constitutional Powers.

SECOND SECTION.—INSTRUCTIONS.

ART. 48.—By separate resolutions the Ministry of Public Works will draw up the instructions to be observed in the radiotelegraph service ; it will fix the places where the stations shall be installed ; it will grant the permits referred to in Article 8 ; it will organise the instruction and examination of operators ; it will fix bases for bookkeeping, and will prescribe all rules of a technical character that have to be observed in the service.

Given, signed, sealed with the Seal of the Federal Executive and countersigned by the Minister of Public Works, at the Federal Palace, Caracas, on the thirty-first day of the month of January, 1921. The 111th year of Independence and the 62nd of the Federation.

(Place for the Seal.)

V. MARQUEZ BUSTILLOS.

Countersigned.
Seal.

G. TORRES,
The Minister of Public Works.

MINISTRY OF PUBLIC WORKS.
UNITED STATES OF VENEZUELA—MINISTRY OF PUBLIC WORKS—DIRECTION GENERAL OF STATISTICS AND COMMUNICATIONS.

B CARACAS, 31st January, 1921.
111th and 62nd Year.

It is Resolved :

By Order of the Provisional President of the Republic and in conformity with Article 48 of the Radiotelegraphic Regulations for the following to be binding.

INSTRUCTIONS FOR RADIOTELEGRAPHIC STATIONS. PRELIMINARY REMARKS.

The present instructions contain the rules which must be observed by the Venezuelan stations in the execution of the Radiotelegraphic Service.

These rules refer principally :

- (1) To the tariff.
- (2) To the transmission of radiotelegrams.
- (3) To the admission and classification of messages.
- (4) To the signals adopted.

Besides the present instructions, the object of which is to facilitate the regularity of the service, the Venezuelan radiotelegraphic stations will be subject to the Law of Telegraphs and

Telephones, to the International Telegraphic Convention, and the International Radiotelegraphic Convention, as well as the regulations annexed to these. The said date will furnish the basis for the execution of the service in the International régime.

The stations will be also subject to the telegraphic tariff used in Venezuela and to those besides which link up the service with the exterior so as to make up the total rate of each message. Likewise they will be subject to the nomenclature of the radiotelegraphic stations, and finally to all the legal conditions and Venezuelan regulations referring to the radiotelegraphic service.

No. 1.—RADIOTELEGRAPHIC STATIONS.

A. Radiotelegraphic stations are shown in the "nomenclature of radiotelegraphic stations" This nomenclature gives the following particulars in regard to every station:—

(1) For coast stations the name, nationality, and geographical position indicated by the territorial division, and by the longitude and latitude of the place; for ship stations, the name, and nationality of the ship, and in certain cases the name and address of the owner.

(2) The call signal. (The signals are different from one another, and each one is formed by a group of three letters.)

(3) Normal range.

(4) The radiotelegraphic system of transmission (musical spark, tonality expressed by the number of duplicate vibrations, etc.)

(5) Length of waves used. (The length of the normal wave is underlined.)

(6) The nature of the services effected.

(7) The hours of opening.

(8) If the case should arise the hour and method of sending hourly signals and meteorological reports.

(9) The coast and ship tariff.

B. The name of the ship station as shown in the first column of the nomenclature is followed in case of ambiguity by the call signal of the station.

C. The following abbreviations are used in service documents:—

P.G.—Station opened for public correspondence in general.

P.R.—Station opened for restricted public correspondence.

P.—Station opened for private interests.

O.—Station opened only for official correspondence.

N.—Station for permanent service.

X.—Station with no fixed intermission.

D. At coast stations the service will be as far as possible permanent by day and night without interruption. Nevertheless, some stations can carry on a service of limited duration.

Coast stations where the service is not permanent may not suspend their work until having transmitted all their radiotelegrams to the ships which are in the sphere of action, nor until after having received from these ships all the radiotelegrams advised. This condition is likewise applicable when ships signal their presence before the suspension of work has been effected.

E. Ship stations are divided into three categories:—

(1) Stations for permanent service.

(2) Stations for limited service.

(3) Stations with no fixed intermission.

During navigation the following must remain in expectation of reception:—

(1) Stations under the first category.

(2) Those under the second category during service hours, and outside of those hours during the first ten minutes of each hour.

Stations of the third category are not bound by any regular waiting service.

The radiotelegraphic service of the ship station is under the supreme authority of the commander or captain of the ship.

F. Fixed stations of the terrestrial zone are divided according to their purpose into four categories, namely:—

(1) Central station

(2) Local stations.

(3) Training stations.

(4) Portable stations.

G. The central station as regard service is bound by obligations of the coast stations.

Local internal stations, which, on account of their position, are outside of communication with ships, will be worked like ordinary national telegraph offices.

Training and portable stations will be governed by the special provisions concerning them which will be prescribed in each case by separate resolutions.

H. All fixed radiotelegraphic stations will be linked with the telegraphic system of Venezuela. By the latter, radiotelegrams can be sent and received.

No. 2.—RADIOTELEGRAPHIC

CORRESPONDENCE.

A. Every person has the right to make use of International radiotelegraphic communication.

The sender of a private telegram is obliged to prove his identity when asked by the office or station of origin.

The right to correspond radiotelegraphically is subject, nevertheless, to the fulfilment of the local regulations and tariffs.

B. The Government does not accept any responsibility by reason of the radiotelegraphic service supplied to private people.

C. The text of the telegram must be written legibly in characters which have their equivalent on the telegraphic signals used in Venezuela. These characters are as follows:—

LETTERS.

A B C D E F G H I J K L M N O P Q R S

T U V W X Y Z.

ã ñ õ ü.

FIGURES.

1 2 3 4 5 6 7 8 9 0

SIGNS OF PUNCTUATION.

Full stop (.); comma (,); semi-colon (;); colon (:); note of interrogation (?); exclamation mark (!); apostrophe ('); hyphen (-); parenthesis (); inverted commas (""); oblique (/); underline (—).

D. The various parts of which a telegram is composed should be written in the following order:—

(1) Supplementary instructions.

(2) The address.

(3) The text.

(4) The signature.

E. The sender must write on the form immediately before the address the supplementary instructions.

Multiple radiotelegrams will have this remark written immediately before the addresses concerned.

The remark "Urgent" is not admitted in Venezuela except on the ordinary telegraphic system.

F. Every address must contain at least two words. The first giving the name of the addressee, the second indicating the station of destination. Nevertheless, if the address is lacking in further necessary particulars for the addressee to be traced without difficulty by the office of destination the sender shall abide by the consequences of insufficient address.

G. The address of radiotelegrams destined for ships must be as full as possible. They must necessarily contain:—

(a) Name or capacity of the addressee with supplementary particulars if need be.

(b) Name of the boat as shown in the first column of the nomenclature.

(c) Name of the coast stations as shown in the nomenclature.

Nevertheless, the name of the ship may be substituted at the sender's risk by the route indication and determined by the name of the ports of origin and destination or by some other similar remark.

H. Telegrams without text are admitted.

The text may be written in plain language or in secret language, and in the latter case it may be in code language or in cypher language. Each one of these languages may be used singly or in combination with others in the same telegram.

It can also be written by means of the International Code of signals. The radiotelegraphic station will not translate this text when the telegram has to be retransmitted to another station.

I. The station of origin in Venezuela does not admit messages in secret language except on condition that they fulfil the requirements established in Article 45 of the radiotelegraphic Regulations. This provision is not applicable to transit telegrams.

J. Plain language is understood to be that which suggests an intelligible meaning in one or more of the languages authorised for International telegraphic correspondence.

The use of code addresses, commercial signs, international code signals, abbreviations, initials such as f.o.b., c.i.f., or analogous terms do not deprive the telegram of its plain language character.

K. Code language is composed of words that do not form intelligible sentences.

Words actual or artificial must be pronounceable in Spanish, German, French, Dutch, English, Italian, Portuguese or Latin.

Artificial words must not bear accented letters.

Code language words must not have more than ten characters of the Morse alphabet. The ch or any other combination of vowels or double consonants will be counted as two letters in artificial words.

Words formed by the combination of two or more in plain language against the usage of the language are not admitted.

L. Cypher language is that formed by—

(1) Either Arabic cyphers, groups or series of Arabic numbers with a secret meaning, or by letters (unaccented), groups or series of letters with a secret meaning.

(2) Words, names, expressions or combinations of letters which do not fulfil the conditions of plain language nor of code language. The mixture of cyphers and letters with a secret meaning is not admitted in the same group.

The groups referred to under Paragraph J are not considered to be of secret meaning.

M. The signature is not obligatory; it may be written by the sender in accordance with custom or substituted by a registered address.

It is indispensable for every message to be signed in Venezuela, although the signature need not be transmitted, at any rate the registered address used as the signature must be translated at the foot of the telegram.

No. 3.—OFFICIAL RADIOTELEGRAMS.

A. An official message is understood to be that dealing with matters of public service and sent by a Government official in the exercise of his duties.

B. Official radiotelegrams must bear the seal of or a memorandum from the sending official unless there is no doubt of their authenticity.

C. The right to send a reply as an official radiotelegram is proved by the production of the message requiring it.

D. Official radiotelegrams can in any case be written in secret language.

E. The receiving station must repeat official messages; partially if they are written in plain language, and wholly if in secret language.

No. 4.—SERVICE RADIOTELEGRAMS.

A. Only authorised employees can send service radiotelegrams free. This privilege is limited to radios that present an urgent character and they must be written in a concise form. Exclusive of such cases the station may refuse the message or forward a duplicate by post.

B. Service advices may also be exchanged free of tariff between two or more stations respecting repetitions, rectifications, or cancellation of messages or anything affecting the correct transmission.

C. When the service advice is requested by a private person it will be charged according to the tariff. In communications with boats the advice may only refer to the rectification of radios previously transmitted. The letters S.T. must precede the preamble of these radiotelegrams. If there should be need to rectify a word it will be indicated by the position it occupies in the text of the message, independent of the rules of taxation.

No. 5.—METHOD OF COUNTING WORDS.

A. All that which the sender writes on the form for transmission is subject to taxation, and is included in the number of words. Hyphens which separate words and signs of punctuation are only transmitted by special request or when they form groups of signs in secret language, and in these cases they are subject to tariff.

B. The name of the station, number of the radiotelegram, time of handing in and other indications in the preamble are not counted or

charged unless the sender inserts any of these remarks in the text of his radiotelegram, and then they form part of the number of chargeable words.

C. One word is counted for the following in all languages :—

(1) In the address.

(a) The name of the office of destination (or the coast station) written as shown in the first column of the Nomenclature with the relative indications.

(b) The names of the territorial subdivisions respectively written in accordance with the Nomenclature.

(2) The name of the ship as shown in the first column of the Nomenclature.

(3) The code words fulfilling the conditions under paragraph K of No. 2.

(4) Every isolated character, letter or cypher, as well as every sign of punctuation, apostrophe or hyphen transmitted at the sender's request.

(5) The underline.

(6) The parenthesis signs.

(7) The inverted commas.

(8) The supplementary instructions.

D. In plain language any word or authorised group—containing fifteen letters of the Morse alphabet is reckoned as a single word. Any characters in excess, should there be any, are calculated as an additional word.

In code language every ten characters are counted as one word.

In cypher language every five letters or numbers are counted as one word.

E. If in the same message there should be complete sentences in plain language and in code language or cypher language the words in each sentence will be counted according to the former rule; but if there should be code or cypher words intercepted in the plain language the whole radiotelegram will be considered as cypher, and if without cyphers as code language.

F. Words joined by hyphens and apostrophes will be counted as separated and the syllabic sounds by the number of letters of which they are composed.

G. The combination of words against general usage is not admitted. Usage is justified if the point should arise by reference to a dictionary of the respective language.

H. The counting of words at the station of origin is decisive, but if the office of destination should discover an error it may claim the excess from the addressee, and if the latter should refuse to pay it have a service advice sent for the amount to be collected from the sender. When the latter has paid the difference another service advice will be sent authorising delivery of the message.

No. 6.—TARIFFS AND TAXATION.

A. Radiotelegrams originating from a ship are taxed as addressed to the nearest coast station. In the charge the supplementary telegraphic tariff will be included.

B. When the sender gives instructions on his message for the retransmission of the radiotelegram to another station he shall pay the tariff relative to each service. This rule will be applied when the retransmission of a radio sent by land is effected through two or more ship stations.

C. The total rate for telegrams will be collected from the sender except :—

(1) Express charges.

(2) Portage charges by the station of destination.

(3) In cases provided for under letter G of this paragraph.

D. The rate will be collected in bolívares, and foreign tariffs will in each case be converted to this currency.

E. Rates will be fixed in accordance with the particulars in the Nomenclature.

F. Ship stations may obtain information from coast stations when they are not in possession of all the necessary particulars for making up the rate of the telegrams.

G. When the transit tax is not shown in the Nomenclature the office of origin will include in the preamble the remark "tax to be collected." The same thing will be done when it is from a sender in a country not adherent to the International Conventions.

H. The sender of the radiotelegram has the right to ask for a receipt with a note of the amount collected. The office of origin may charge a fee for this of 25 cents.

No. 7.—TRANSMISSION OF RADIOTELEGRAMS.

A. The length of a normal wave is 600 metres. Every station must be equipped so as to be able to send waves of 300 metres as well. But it must always be in condition to receive calls made by means of the normal wavelength.

B. Stations intended exclusively for determining the position of ships must not use wavelengths exceeding 150 metres.

C. The foregoing conditions, indispensable to a good public service shall not prevent, if the case should arise, for the Government to make any variations which it may judge convenient for its radiotelegraphic correspondence.

D. Stations must maintain traffic with the least waste of power. Ship stations must not use more than 1 kW, unless the boat is obliged to communicate at a distance exceeding 200 nautical miles, or when exceptional circumstances require an increase in power.

E. The exchange of signals, superfluous words, experimenting or practice, that may disturb the service of other stations is forbidden. For this reason training and portable stations will use wavelengths different to the normal.

F. Should the foregoing rules be infringed the station must lodge a complaint in detail to the Direction-General of Federal Telegraphs and Telephones.

No. 8.—TRANSMITTING SIGNALS.

A. The Morse Code signals are used in the service.

B. The spacing and length of the signals is as follows :—

(1) The dash is equal to three dots.

(2) The space between the signals of the same letter is equal to a dot.

(3) A space between two letters is equal to three dots.

(4) A space between two words is equal to five dots.

C. Letters are represented by the signal shown in the following table :—

a ● —
 ā ● — ● —
 ä ● — ● —
 b — — ● —
 c — — ● —
 ch — — — —
 d — — ● —
 e ●
 ē ● — — ● —
 f ● — — —
 g — — ● —
 h — — ● —
 i ● —
 j — — — —
 k — — — —
 l — — ● —
 m — —

D. The figures are represented as follows :—

[illegible]

In office repetitions and in the preamble and in cypher telegrams with the remark "in cypher" numbers may be abbreviated as follows:—

1	● —	6	— ● ● ● ●
2	● ● —	7	— ● ● ● ●
3	● ● ● —	8	— ● ●
4	● ● ● ● —	9	— ●
5	● ● ● ● ●	0	—

E. Signs of punctuation and other indications are represented as follows :—

Punto (.)	• • • • •
Coma (,)	— — — — •
Punto y coma (;)	— — — — •
Dos puntos (:)	— — — — •
Punto de interrogación o demanda de una transmisión no com- prendida (?)	• • — — • •
Punto de admiración (!)	— — — — —
Apóstrofe (')	— — — — •
Guión (-)	— — — — •
Raya de fracción (/)	— • — — —
Paréntesis, antes y des- pués de las palabras ()	— — — — —
Comillas, antes y des- pués de las palabras ("...")	• • — — • •
Subrayado antes y des- pués de las palabras o de las frases	• • — — —
Llamada (preliminar de toda transmisión)	— — — — —
Doble guión (=)	• • — — —
Comprendido	• • — — —
Error	• • — — —
Cruz (+)	• • — — —
Invitación a transmitir	— — — — —
Espera	• • — — • •
Fin de trabajo	• • — — —
Señal de siniestro (re- petida a cortos inter- valos)	• • — — —

In the transmission of fractions, whole numbers should be separated from the fractions by the double hyphen (=) so as to avoid—*e.g.*, 11/4 being confused with 1=1/4.

• F. When a station notices the distress signal • • • — — — • • it shall suspend all correspondence, and not renew it until having made certain that the communication which originated by the call for help has been concluded.

G. The station which perceived a call for help must obtain all necessary particulars from the ship making the call as regards the order of the communications or the cessation of them.

H. When a signal for help is addressed to a particular station it devolves upon the latter to reply unless it cannot reply. In the absence of a special indication each station is obliged to answer.

I. Stations must alternate in their transmission of radiotelegrams and each series should not exceed fifteen minutes.

J. A transmission begun shall only be suspended in case of absolute urgency.

K. Radiotelegrams of the same category shall be forwarded in the order in which they are handed in.

L. The order of priority is as follows :—

- (1) Official radiotelegrams in accordance with the rank of the sending official.
- (2) Service radiotelegrams.
- (3) Private radiotelegrams.

M. The call signal is composed of the sign **— • — • —** followed by the call repeated three times by the station called, the word "from" and the signal repeated three times from the station calling.

N. The station called replies by the signal — • — • — followed by the call signal repeated three times from the station in question by the word "from" its call signal, and the sign — • —

O. As a general rule the ship station is the one that calls the coast station whether the latter should have radiotelegrams to transmit or not.

P. Stations which want to communicate with ships without knowing the names of those in their sphere of action may use the exploration signal **— • — — • — • —**

Q. Every station that is obliged to effect transmission of high power first of all sends the advice signal three times — — — — — with the minimum power required for reaching the neighbouring stations. The high power shall not be begun to be transmitted until thirty seconds after the despatch of the advice signal.

R. If a station cannot reply to a call signal which is repeated three times at intervals of two minutes each, the call cannot be repeated until an interval of fifteen minutes has elapsed. The station calling verifying that there is no other radiotelegraphic communication in progress.

5. The ship station must inform each coast station to whom it has signalled its presence when it proposes to cease operations, and how long the interruption will last.

T. As soon as the coast station has replied the ship station will furnish the information that follows, if it has messages to be transmitted to it, the following information will also be given when the coast station asks for it:—

(a) The approximate distance in nautical miles from the ship to the coast station.

(b) The position of the ship shown in a concise manner, clear and applicable to the circumstances of the case.

(c) The nearest port at which the ship will touch.

(d) The number of radiotelegrams, if they are of ordinary length, or the number of words if they are exceptionally long.

The speed of the ship in nautical miles will be specially shown at the particular request of the coast station. The coast station should reply at once and indicate the number of radiotelegrams that it has to transmit.

In case the transmission cannot be made immediately, both should communicate the approximate duration of the time of waiting.

Between two ship stations it devolves upon the station called to fix the order of transmission.

When a coast station receives calls from various ship stations it shall decide the order for reception endeavouring for this purpose to procure from every station taking part the transmission of the greatest number of radiotelegrams.

A telegram which is not in order must not be delayed or refused. It must be received and a request made if necessary by service advice for correction.

U. Before beginning a transmission a ship station shall advise whether it should be done in series or in alternate order; the transmission will then be begun by means of the signal — • • • —

V. The transmission of the radiotelegram is preceded by the signal — • • • • • — The station proceeds at once with the transmission of the preamble in the following order:—

(a) Service remark "radio."

(b) Nature of the radiotelegram by one of the remarks S, A, D, according to whether it is an official message, service advice, or a private urgent message.

(c) The letter B is only used when the station is in direct communication with the station of destination.

(d) Office of origin or ship station.

(e) Number of the telegram.

(f) Number of changeable words.

(g) The time of handing in by two groups of figures: the first showing the day of the month, and the second the hour and minutes. Ship stations shall show the time by the numbers 0-24.

(h) The route to be followed will be shown on the form.

(i) Service remarks.

W. After the preamble the supplementary instructions, the address, the text and the signature will be consecutively transmitted.

The double hyphen (— • • • • —) is transmitted so as to separate the preamble from the supplementary instructions and the other parts of the telegram.

The transmission concludes with a signal — • • • • • — followed by the signal of the sending station and by the signal — • • • —. In the case of a series the signal and the signal — • • • — will not be given until the end of the series.

When a radiotelegram contains more than forty words the sending station may interrupt the transmission after every twenty words more or less by means of a sign of interrogation — • • • — and will not go on with the transmission until the repetition of the last word has been properly received, followed by a note of interrogation or if the transmission is correct by the signal — • • • —. If the operator, who is making the transmission, finds that he has made a mistake he will interrupt it by the error signal — • • • • • —, the last word which was correctly transmitted being repeated and the rectified transmission continued.

In the case of transmission by series the advice of receipt will be given after every radiogram.

The coast stations occupied in transmitting long radiotelegrams must suspend transmission at the end of a period of fifteen minutes, and keep silent for three minutes before continuing the transmission.

X. The advice of receipt will be given by means of the letter R followed by the number of the radiotelegram received. This advice is preceded by the indication signal of the sending station and followed by that of the receiving station.

Y. The conclusion of the operation between two stations is indicated by each one by means of a signal — • • • • • — followed by the relative indication.

Z. When signals are doubtful the radiotelegram may be repeated up to three times. If it is still illegible it is cancelled.

In any case the receiving station can send it to its destination bearing the service mark "reception doubtful."

The sender of a radiotelegram who establishes his identity may cancel it. If it should not have been transmitted the charges will be returned to him with the exception of a tax of 25 cents, bolivares.

If the transmission should have already been effected the cancellation will be made by a taxed service advice.

NO. 9.—FORWARDING TO DESTINATION

A. The sender may order a radio to be sent by telephone. If so, the word "Telephone" shall be written before the address.

B. For despatch to destination radiograms are classified in the same order of priority as for transmission.

C. Radios with the remark "Day" are not delivered during the night; those received during the night are not immediately delivered unless they contain the word "Night," or the receiving station should consider them to be of a real urgent character.

D. The radiogram may be delivered in the absence of the addressee to the members of his family, and to persons in his employ. The remark "M.P." or "manos propias," i.e. (own hands), as well as the remark "Open," are only admitted in official correspondence.

E. When the radiograms cannot be delivered the station of destination shall explain the reason by service advice. If need be, a mistake in the address will be corrected.

F. Radiograms not transmitted shall be sent by post to the Direction-General of Federal Telegraphs and Telephones to be filed.

G. When a radiogram has to be transmitted to a boat and the latter is not yet within range

of the station, it will be treated like a message not transmitted, the sender being advised on the eighth day unless the latter should order another waiting period of nine days. If the station is sure that the ship has sailed from its range it may cancel the message and advise the sender.

Let it be communicated and published.

By the Federal Executive,

G. TORRES.

VIRGIN ISLANDS OF THE U.S.A.

(See also Map Section)

THESE islands were purchased from Denmark on December 22, 1916, by the United States of America, and are administered by a Governor. They have an area of 132 square miles and a population of 26,051.

CONTROL.

There are two wireless stations in the Virgin Islands, which are owned and administered by the United States Navy, and are governed by such laws and regulations as are in force in the United States of America.

WEIHAIWEI

(See also Map Section)

WEIHAIWEI, a territory in the Shantung district of China, leased by that Republic to Great Britain in 1898, lies in latitude $37^{\circ} 30' N.$ and longitude $121^{\circ} 40' E.$ The total area comprises 285 square miles with a population of 147,177.

Negotiations are under way for the formal handing back of Weihaiwei to China, and may possibly be concluded by the time this book is published.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sir J. H. Stewart Lockhart, K.C.M.G.	Commissioner of Weihaiwei ..	Government House, Port Edward, Weihaiwei.
Mr. A. P. Blunt	Senior District Officer ..	Government Offices, Port Edward, Weihaiwei.

ADMINISTRATION.

Wireless Telegraphy in the territory is governed by :

A—Ordinance No. 5 of 1913.

A AN ORDINANCE TO PROVIDE FOR THE
REGULATION OF WIRELESS
TELEGRAPHY.

L.S. August 11th, 1913.

BE IT ENACTED by the Commissioner of
Weihaiwei as follows:—

1. This Ordinance may be cited as "The
Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic
or magnetic telegraph, and includes appliances
and apparatus for transmitting or making
telegraphic, telephonic or other communications
by means of electricity, galvanism, or magnetism.

The expression "Wireless Telegraphy"
means any system of communication by
"telegraph" (as defined in this Ordinance)
without the aid of any wire connecting the
points from and at which the messages or
other communications are sent and received:
provided that nothing in this Ordinance shall
prevent any person from making or using an
electrical apparatus for actuating machinery
or for any purpose other than the transmission
of messages.

3. The Commissioner may whenever he
shall deem it expedient to do so license the
establishment of any wireless telegraph
station or the installation or working of any
apparatus for wireless telegraphy in any place
in the territory or on board any British ship
registered in the territory.

4. (i) No person shall establish any wireless
telegraph station or instal or work any apparatus
for wireless telegraphy in any place in the
territory or on board any British ship registered
in the territory except under and in accordance
with a license granted in that behalf by the
Commissioner.

(ii) Every such license shall be in such
form and for such period as the Commis-
sioner may determine and shall contain
such terms, conditions and restrictions on
and subject to which the license is granted as
the Commissioner shall consider desirable
in the public interest.

5. (i) If any person establishes a wireless
telegraph station without a license in that
behalf or installs or works any apparatus for
wireless telegraphy without a license in that
behalf he shall be liable to a fine not exceeding
one thousand dollars or to imprisonment of
either description for a term not exceeding
twelve months and in either case be liable
to forfeit any apparatus for wireless tele-
graphy installed or worked without a license,
but no proceedings shall be taken against any
person under this Ordinance except with the
previous sanction of the Commissioner.

(ii) If a magistrate is satisfied by infor-
mation on oath that there is reasonable
ground for believing that a wireless tele-
graph station has been established without
a license in that behalf or that any apparatus
for wireless telegraphy has been installed or
worked in any place or on board any ship
within the jurisdiction without a license
in that behalf he may grant a search
warrant to any police officer to enter and
inspect the station, place, or ship, and to
seize any apparatus which appears to him
to be used or intended to be used for wireless
telegraphy therein.

6. (1) The Commissioner may make regula-
tions for all or any of the following matters:—

(i) For prescribing the form and manner
in which applications for licenses under
this Ordinance are to be made;

(ii) For prescribing the fees payable
on the grant of any license;

(iii) For regulating the manner in
which apparatus for wireless telegraphy
on board a merchant ship whether
British or foreign in the waters of the
territory shall be worked so as to prevent
interference with naval signalling or the
working of any wireless telegraph station
lawfully established, installed or worked
in the territory or the waters thereof and
so as not to interrupt or interfere with
the transmission of any wireless messages
between wireless telegraph stations estab-
lished as aforesaid on land and wireless
telegraph stations established on ships
at sea;

(iv) For prohibiting except with the
special or general permission of the Com-
missioner the working or using of any
apparatus for wireless telegraphy on
board a merchant ship whether British
or foreign whilst such ship is in any
of the harbours of the territory;

(v) For prohibiting or regulating in
case at any time in the opinion of the
Commissioner an emergency has arisen
in which it is expedient for the public
service that His Majesty's Government
should have control over the transmission
of messages by wireless telegraphy on
board merchant ships whether British
or foreign in the waters of the territory
the use of wireless telegraphy on board
such ships while in such waters by such
further rules as the Commissioner may
see fit to make from time to time and
either in all cases or in such cases as may
be deemed desirable.

(2) Provided that no regulations made
in respect of the matters described in pa-
graphs (iii), (iv) and (v) of this section
shall apply to the use of wireless telegraphy
for the purpose of making or answering
signals of distress.

7. When an applicant for a license proves
to the satisfaction of the Commissioner that
the sole object of obtaining the license is to
enable him to conduct experiments in wireless
telegraphy a license for that purpose shall be
granted subject to such special terms, condi-
tions and restrictions as the Commissioner
may think proper, but shall not be subject to
any rent or royalty.

8. (i) Every omission or neglect to comply
with and every act done or attempted to be
done contrary to the provisions of this Ordi-
nance or of any regulations made thereunder
or in breach of the conditions and restrictions
subject to or upon which any license has been
issued shall be deemed to be an offence against
this Ordinance, and for every such offence
not otherwise specially provided for the
offender shall in addition to the forfeiture of
any articles seized be liable to a fine of five
hundred dollars.

(ii) All convictions, forfeitures and fines
under this Ordinance or any regulations made
thereunder may be had and recovered
before a magistrate.

9. Ordinance No. 1 of 1904 to regulate the
establishment of wireless electric telegraphy
is hereby repealed.

WESTERN SAMOA (Territory of)

(See also Map Section)

Including • Savaii and Upolu.

SAMOA (or Navigators Islands) is a group of islands in the Western Pacific lying in $13\frac{1}{2}^{\circ}$ to 14° S. lat. and 168° to 173° W. long.

The group consists of nine islands in addition to rocks and islets, having a total area of about 1,300 square miles, with a population of 13,051. Only four islands are of any size, Savaii, Upolu, Tutuila and Manua, the two latter and all other islands east of the 171^{st} degree W. longitude are known as American Samoa and are controlled by the Navy Department of the United States of America.

On the northern side of Upolu is the harbour of Apia and along the shore of the bay is built the town of Apia, which is the centre of political and commercial life in Western Samoa. Apia Radio Station is situated about seven miles inland from the town.

At the outbreak of war in 1914, Western Samoa, which was at that time a German possession, was seized by a force of New Zealanders. The military occupation continued until after the signing of peace.

When the Treaty of Peace was signed, the German Government renounced all right and title to the territory of Western Samoa.

It was agreed between the Allied and associated powers that this territory be administrated by His Majesty, in his Government of the Dominion of New Zealand, Colonel R. W. Tate, C.B.E., being appointed Administrator of the territory by the Governor-General of New Zealand.

CONTROL.

The New Zealand Posts and Telegraphs Department is responsible for the administration of Wireless Telegraphy in Western Samoa.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
E. E. Dunwoodie	Superintendent	Apia
J. H. Dixon	Engineer	"
H. S. Fredericks	Senior Operator	"

ORGANISATION.

There is at present only the one station—Apia Radio—but there is a possibility of Savaii being linked up by wireless telephony during the next 18 months.

Apia Radio has two transmitting sets (Telefunken), a 50 kW. and 8 kW. The station is in direct communication with New Zealand every few hours daily and is also responsible for relaying Tahiti, Rarotonga and Nukualofa traffic to and from New Zealand.

Weather reports are transmitted daily (excepting Sundays) at 2330 G.M.T. on 2,000 metres and at 0830 G.M.T. on 600 metres. These are compiled by the Director of the Samoan Observatory at Apia. No other services such as time, press or hydrographic signals are performed.

ADMINISTRATION.

The administration is exactly the same as that of New Zealand, the Governor-General having extended the Post and Telegraph Act, 1908, with its amendments, to apply to Samoa in the same manner as if that territory were part of it.

WINDWARD PASSAGE

(See under BRITISH WEST INDIES.)

ZANZIBAR

(See also Map Section)

Including : Pemba.

THE Zanzibar Protectorate includes the islands of Zanzibar and Pemba. The main islands, which is known as Zanzibar, covering an area of 640 square miles, lies in 6° south latitude, and is separated from the mainland by a channel 22½ miles across at its narrowest part. It was not until during the sixteenth century that the Arabs of the East Coast succeeded in driving out the Portuguese, and the island was then attached (more or less nominally) to the rules of Muscat.

The area of the islands is 1,020 square miles with a population of 196,733.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. R. Withycombe, M.B.E. . .	Director of Electricity, Railways, and Wireless Telegraphy	
Mr. S. W. Dyer	Assistant do. do.	Zanzibar Zanzibar

ORGANISATION.

The Government maintains wireless stations in Zanzibar, Pemba (see map on p. 554) and Mafia.

ADMINISTRATION.

We append herewith the Decree issued by the Sultan in 1909 in regard to wireless.

WIRELESS TELEGRAPHY DECREE. No. 6 of 1909.

In the name of the Most Merciful God.
It is hereby declared as follows :—

1. (1) No person shall establish any wireless telegraph station or install any apparatus for wireless telegraphy in any place in our dominions except under and in accordance with a license granted in that behalf by our First Minister.

(2) Every such license shall be in such form and for such period as our First Minister may determine, and shall contain the terms, conditions and restrictions on and subject to which license is granted, any such license may include two or more stations or places.

(3) If any person establishes a wireless telegraph station without a license in that behalf or installs or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of an offence against this Decree, and on conviction he shall be liable to a fine not exceeding 1,500 rupees, or to simple imprisonment for a term not exceeding twelve months, or to both, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Decree except by the order of our First Minister.

(4) If the Court is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within its jurisdiction without a license in that behalf, it may grant a warrant to any officer of our police to enter and inspect the station or place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Our First Minister may make regulations for prescribing the form and manner in which applications for licenses under this Decree are to be made and fees payable on the grant of any such license.

2. Where the applicant for a license proves to the satisfaction of our First Minister that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted, subject to such special terms, conditions, and restrictions as our First Minister may think proper, but shall not be subject to any rent or royalty.

3. No person shall work any apparatus for wireless telegraphy installed on any ship whilst that ship is in the waters of our dominions otherwise than in accordance with regulations made in that behalf by our First Minister, and our First Minister may by any such regulations impose penalties for the breach of any such regulations not exceeding 150 rupees for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Decree shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. The term "ship" includes steamers, sailing ships, dhows, lighters, rafts, and every other form of boat. The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Indian Telegraph Act, 1883" without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Decree shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

5. This Decree may be cited as "The Wireless Telegraphy Decree, 1909."

Given under our hand and seal this 9th day of February, 1909.

ALI-BIN-HAMOUD.

Countersigned under the provisions of Article 47 of "The Zanzibar Order in Council, 1906."

JOHN H. SINCLAIR,
British Agent and Consul-General.

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|----------------------|-----------------------|
| 1. Public General | 4. Military |
| 2. Direction Finding | 5. Private Restricted |
| 3. Official | 6. Private |
| 7. Aviation | |

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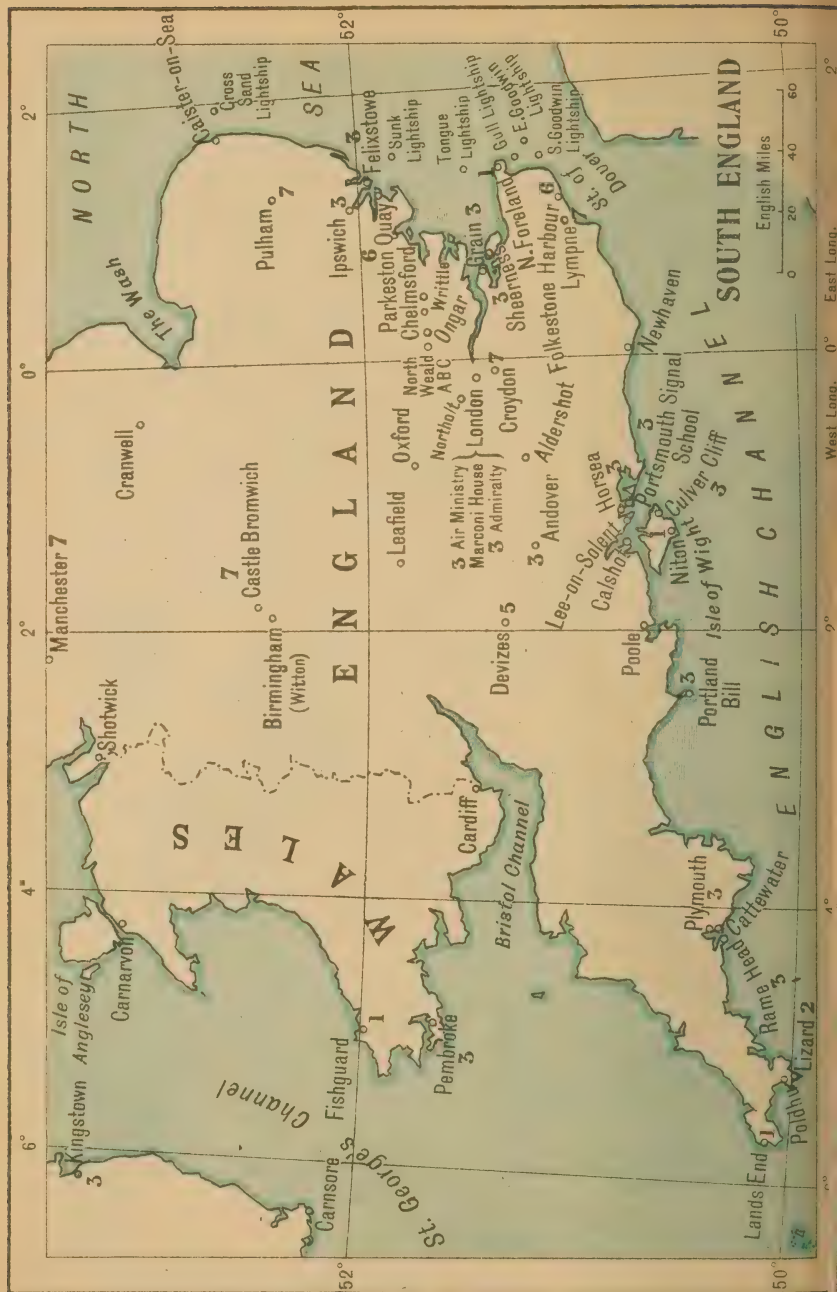


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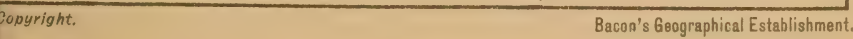
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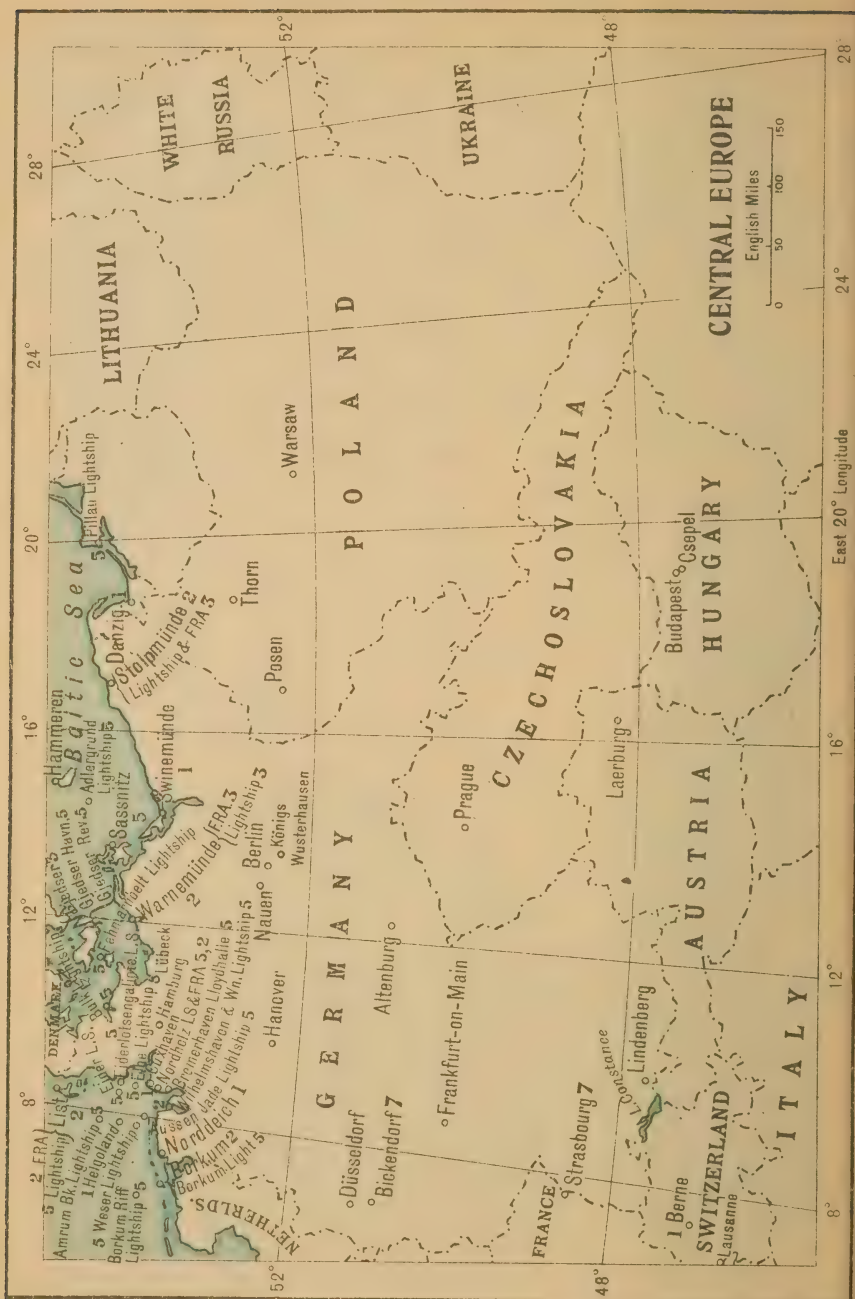
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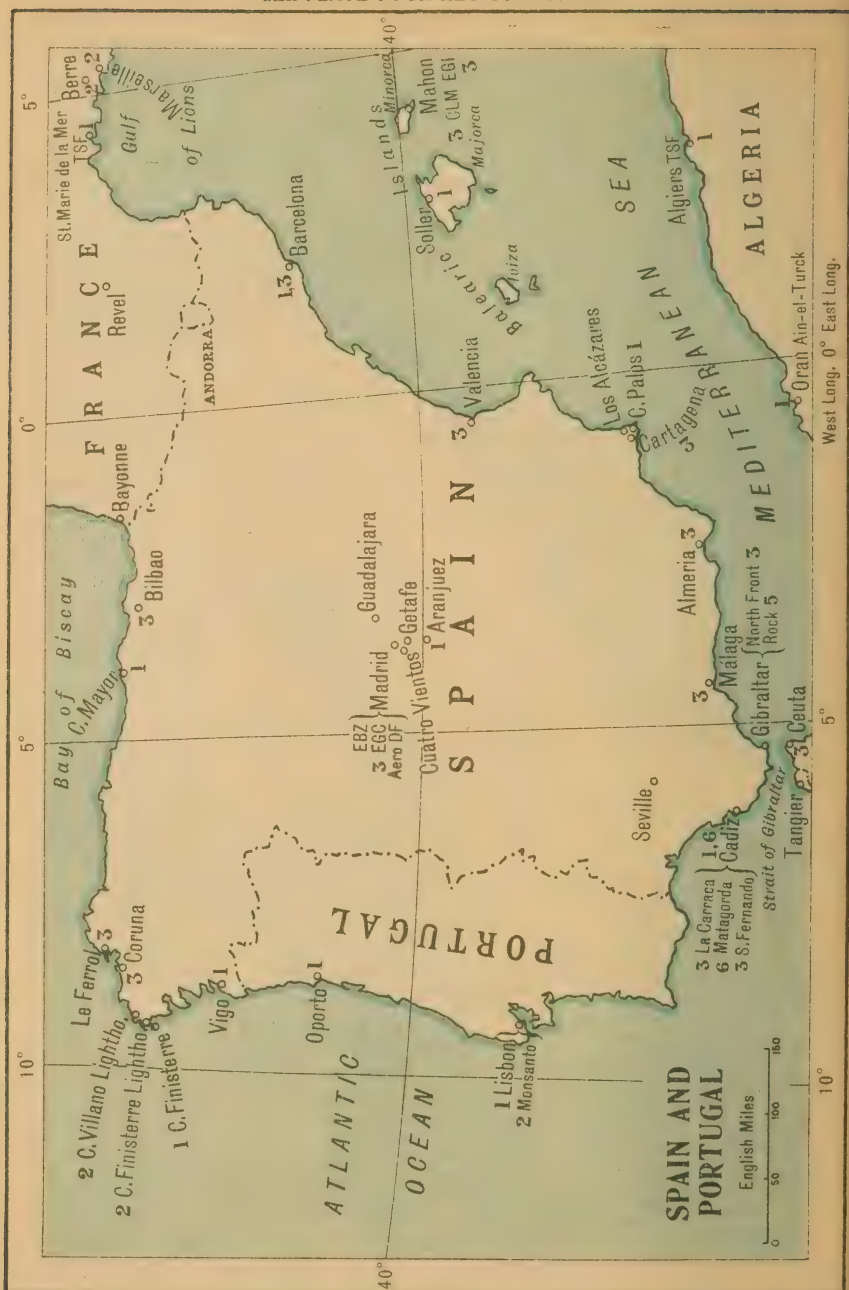




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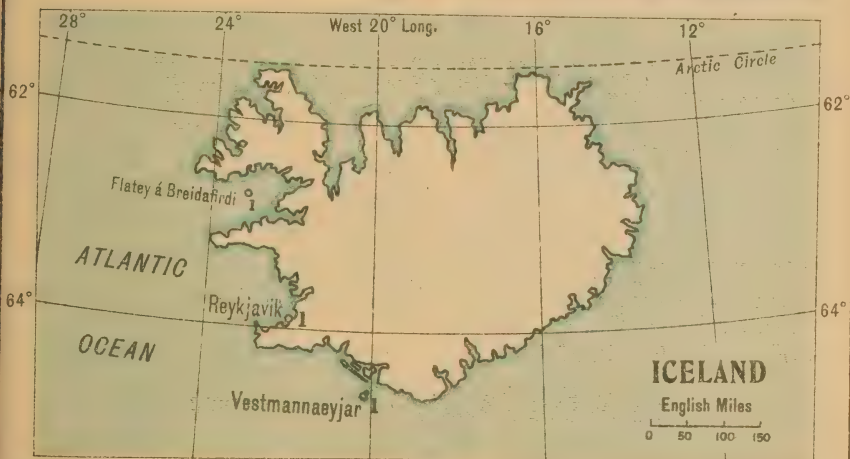
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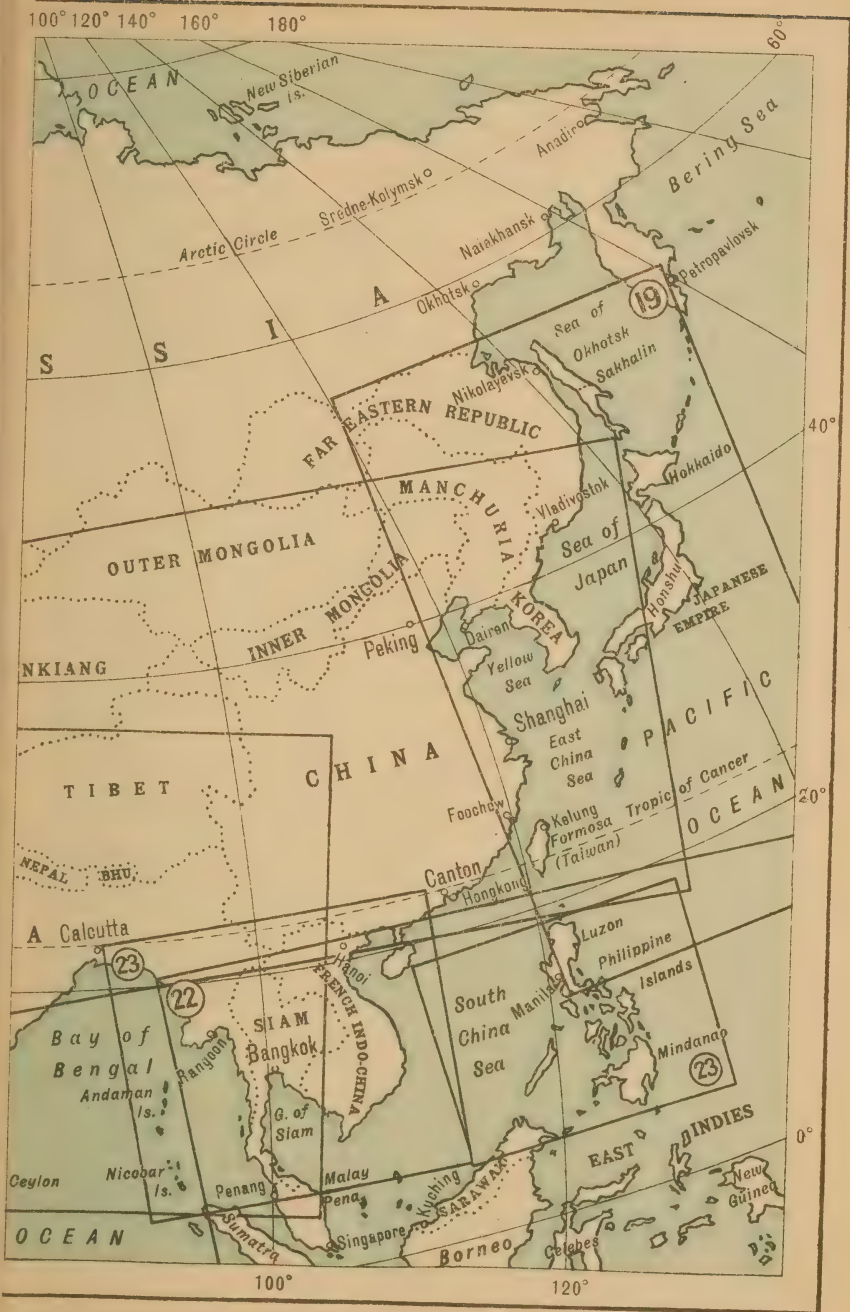
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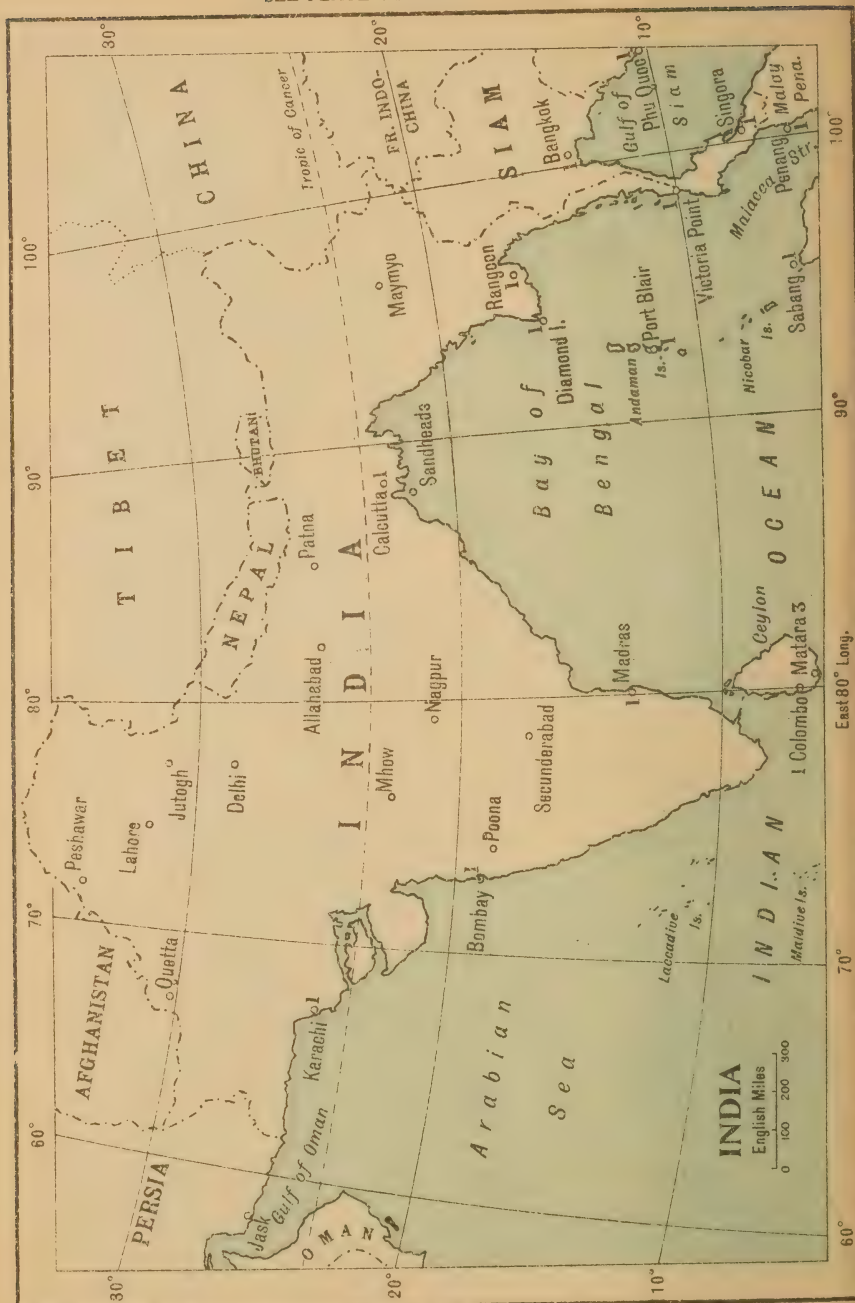
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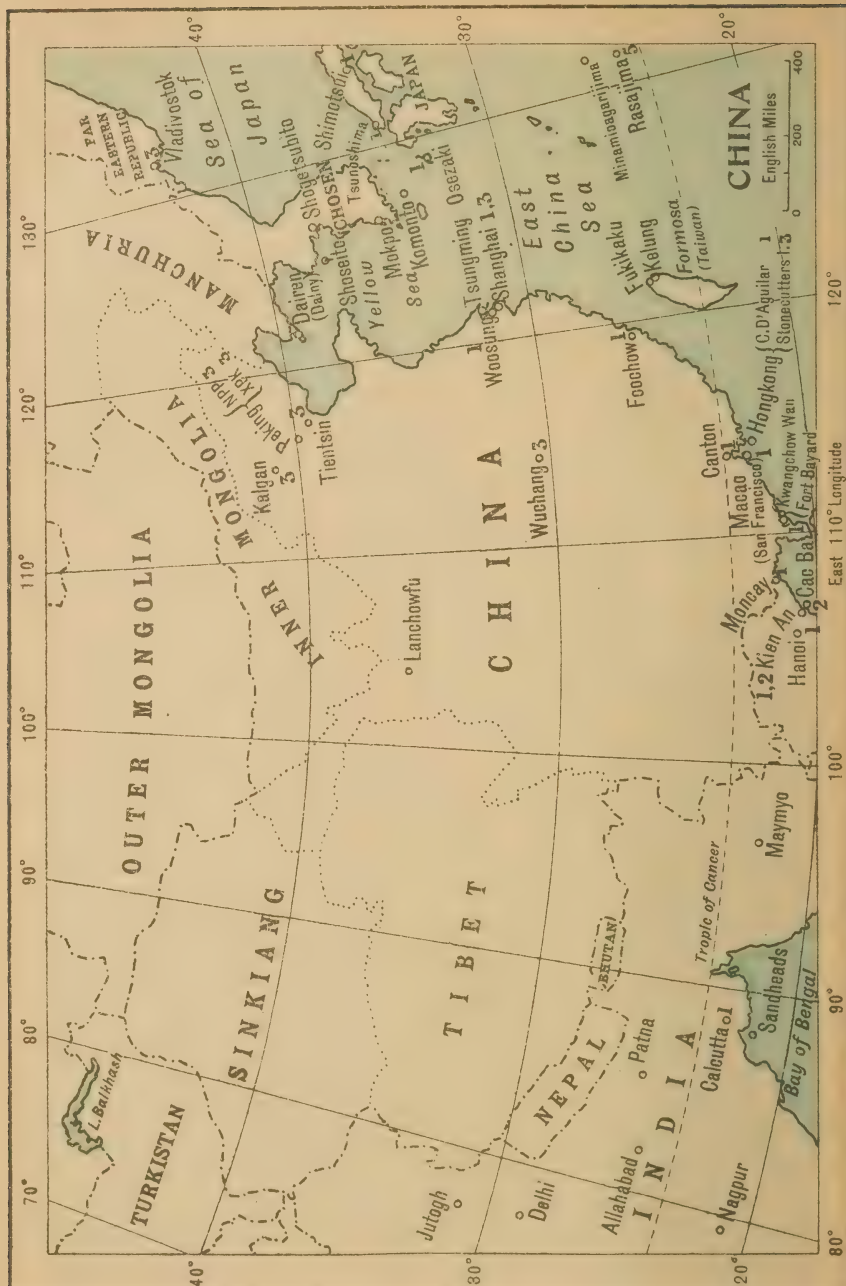


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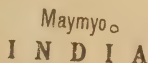
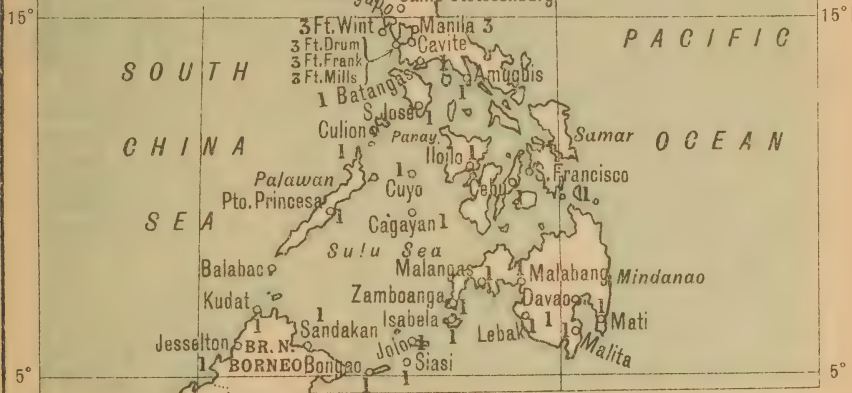
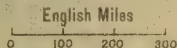
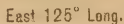


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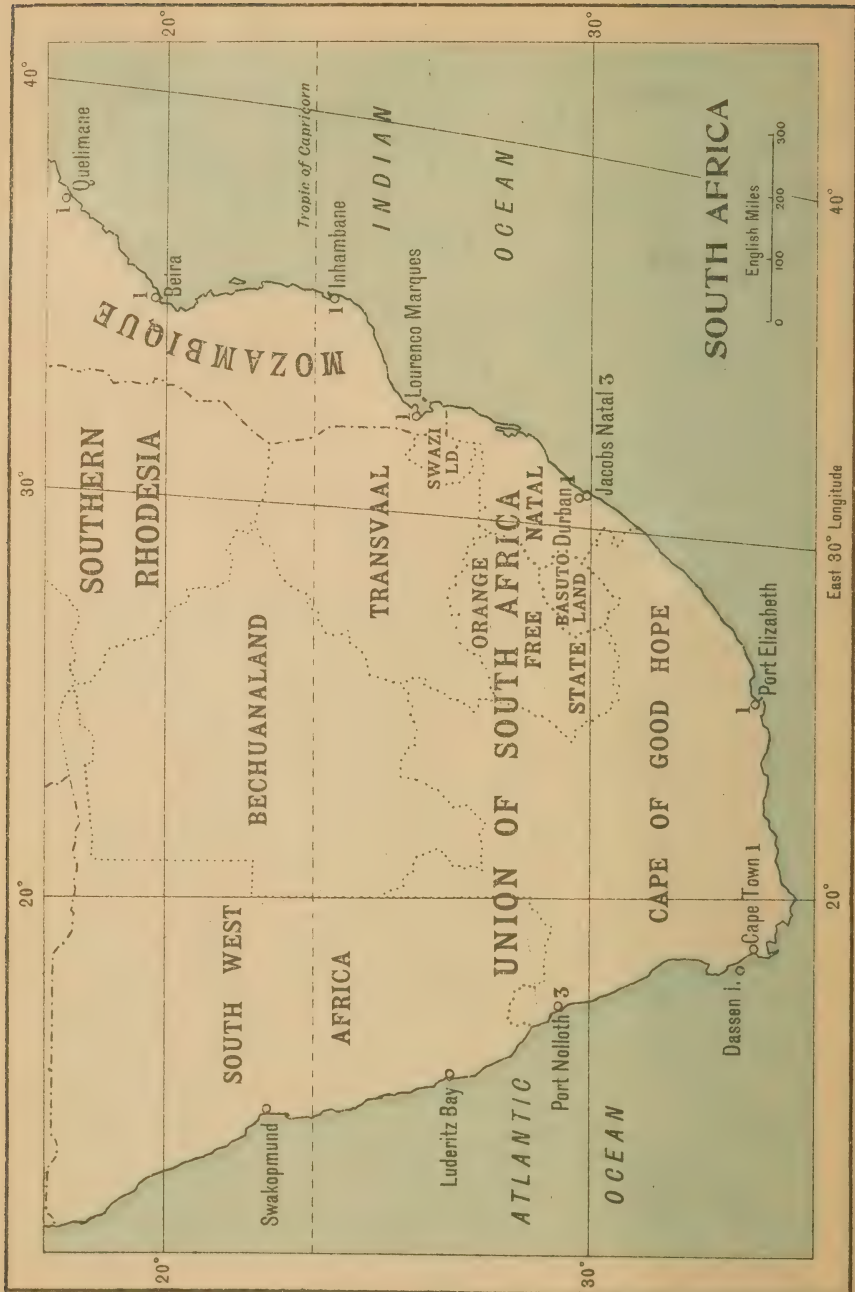


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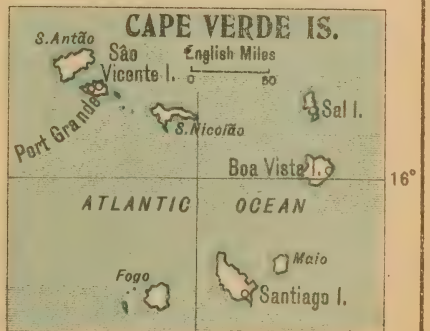
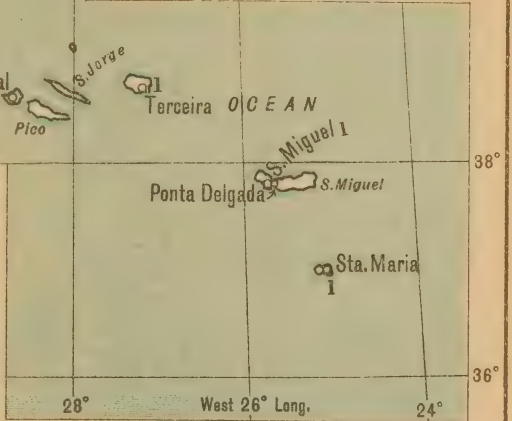
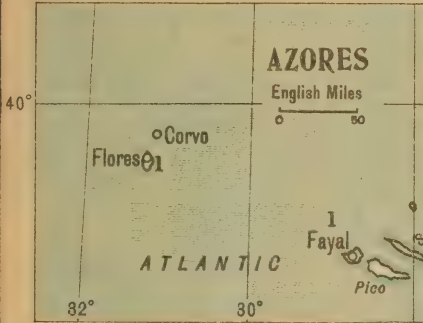
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West 5°40' Long.

East 39° Long.



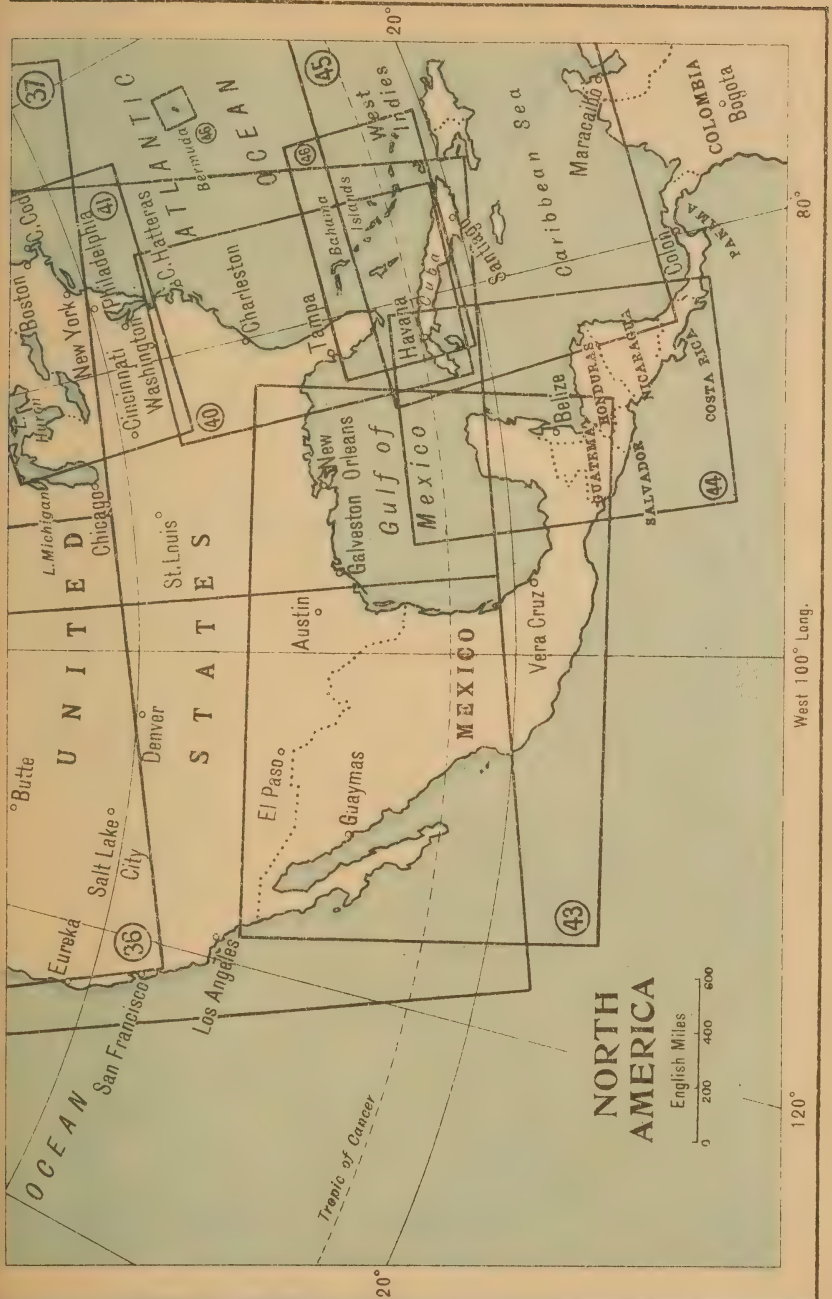
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West 24° Long.

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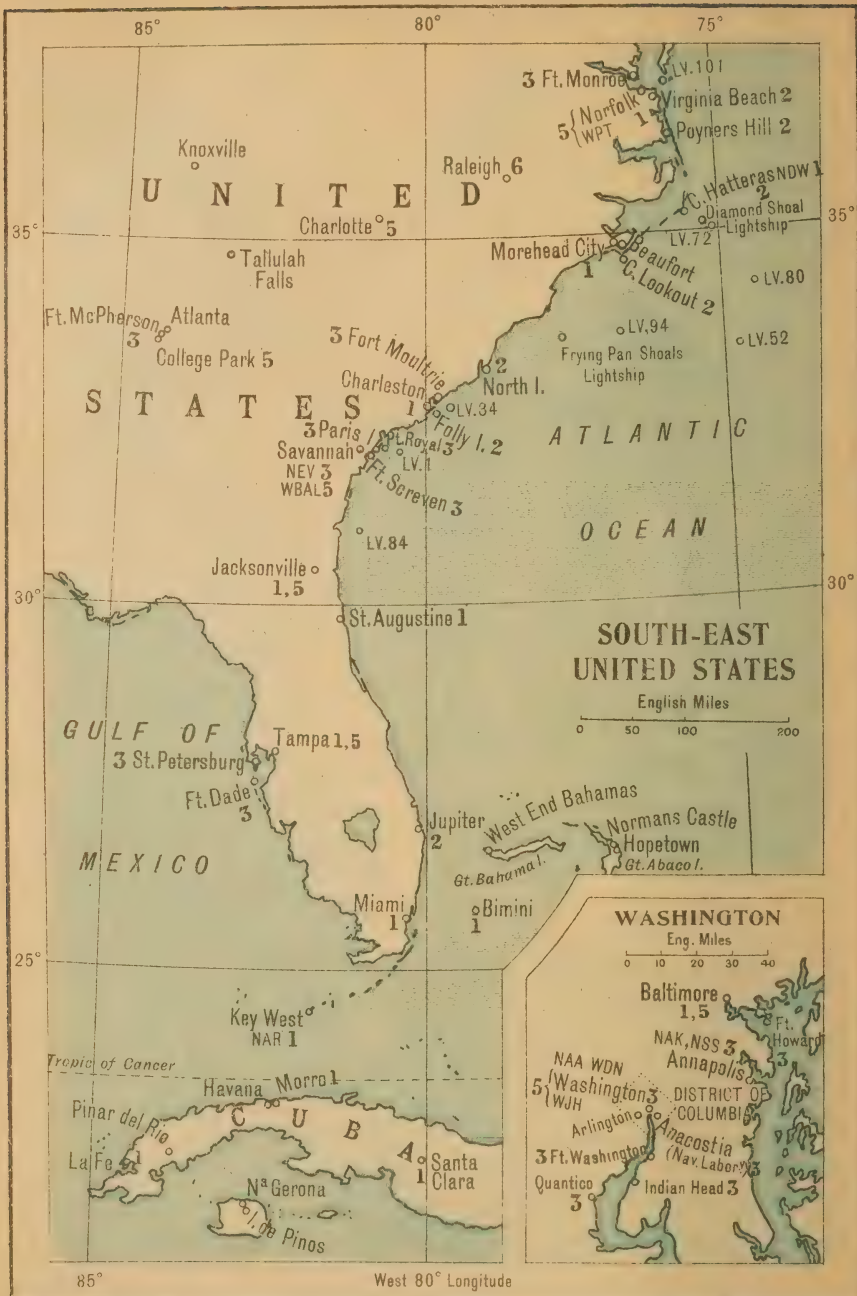


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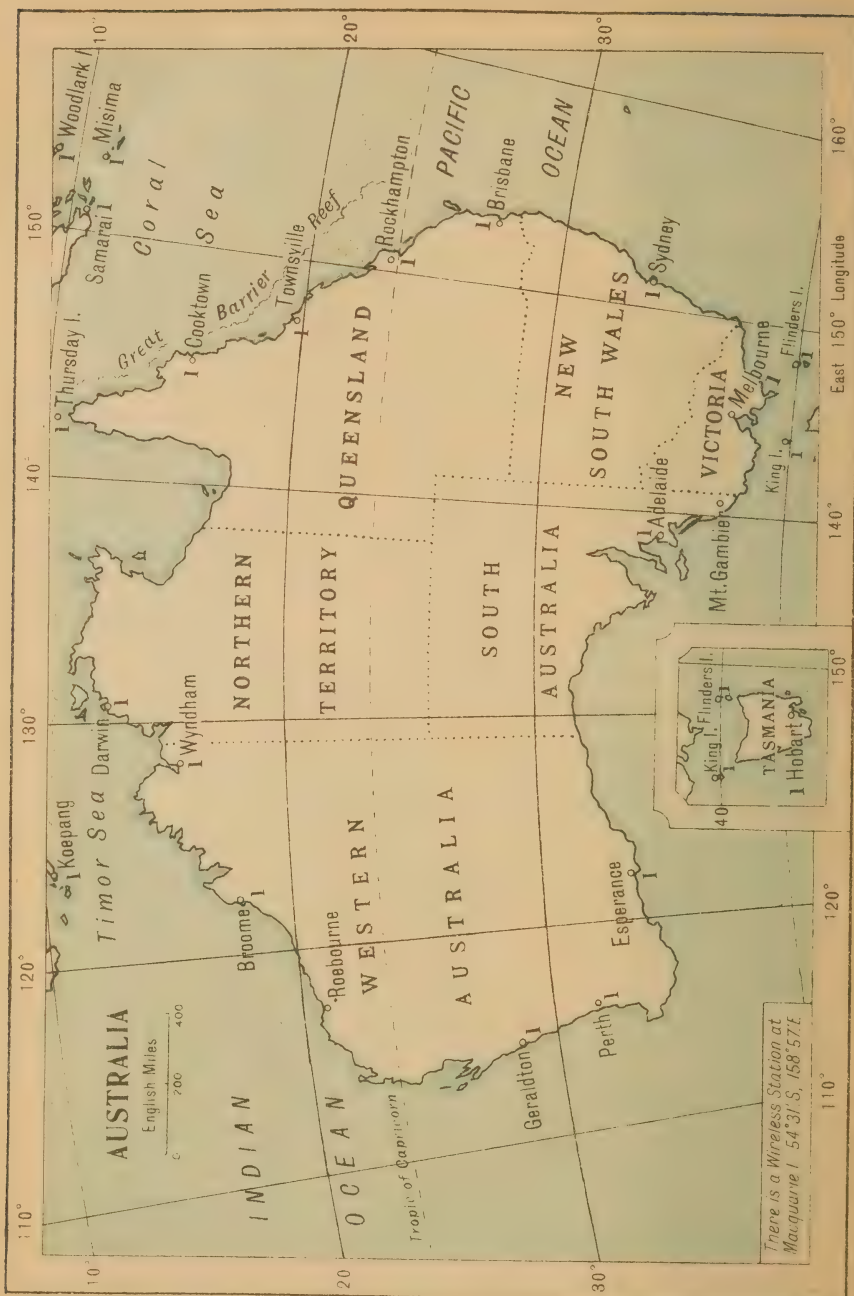
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THE WORLD'S
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STATIONS

LAND STATIONS

The tables of land stations set out in the following pages should be consulted in conjunction with the "Alphabetical List of Call Letters" subsection and the Map Section of this volume. The stations have been grouped together under the names of the countries in which they are situated.

The following abbreviations are used in the Table of Land Stations below :—(Geographical Position) : E—East Longitude ; W—West Longitude ; N—North Latitude ; S—South Latitude. (Nature of Service) : P G—General Public Correspondence ; P R—Restricted Public Correspondence ; O—Official Correspondence ; D F—Direction Finding Service. (Hours of Service) : N—Continuous Service ; X—No fixed working hours.

N.B.—The times shown are G.M.T. unless otherwise stated.

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
ABYSSINIA (Ethiopia)										
Gambela	Meridian of Greenwich 08° 14' 45" N. 34° 35' 30" E.	GMR	250-300	Sudan Government	700	P G	Weekdays 0600 to 1300 Fridays and holidays, 0900 to 1100	—	—	
Mersa Fatma ..	40° 18' 00" E. 14° 14' 00" N.	IRT	100	—	600	—	—	—	—	
ADMIRALTY ISLANDS (See under NEW GUINEA (Territory of))										
ÆGEAN ISLANDS										
DODECANESE	28° 15' 35" E. 36° 27' 10" N.	ICW	—	Italian Army	600	Military only	0000 to 0200 0300 to 0400 0800 to 0900 1040 to 1100 1600 to 1800 2200 to 2230	—	—	† Station takes correspondence for the general public when not engaged in military correspondence of the State
Stampalia	—	IDA	—	Italian Army	—	—	2300 to 2400 X	—	—	
ALASKA (See under U.S.A.)										
ALBANIA										
Saseno	10° 17' 17" E. 40° 29' 52" N.	IDB	—	Army	—	—	—	—	—	

Land Stations—Continued.

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
ARGENTINE REPUBLIC										
Buenos Aires ¹	Meridian of Greenwich.	LH	—	Navy	800	—	4 hours later than Greenwich time	—	—	¹ Under construction
Año Nuevo	Darsena Norte	LIO	432	Navy	600 1,800	P G	0205 1800 to 0600	0.60	6.00	² Time signals transmitted daily. For full particulars see International Time and Weather Signals, Argentina
Cape Virgins	54° 39' 25" S. 64° 03' 10" W. Entrance to the Strait of Magellan	LIF	270	Government	300, 600	P G	N	0.60	6.00	³ The accounts are settled by the General Direction of Posts and Telegraphs, Buenos Aires
Coloquio Militar (Military College)	52° 20' 00" S. 68° 22' 00" W. Buenos Aires	LNG	40	Army	400	O	X	—	—	
Comando 2da Division Ejercito (Com. 2nd Army Div.)	34° 34' 00" S. 58° 33' 00" W. Buenos Aires	LNS	40	Army	400	O	X	—	—	
Comando 1ra Division Ejercito (Com. 1st Army Div.)	34° 33' 00" S. 58° 41' 00" W. Buenos Aires	LNR	40	Army	400	O	X	—	—	
Comodoro Rivadavia (Com. inland waterways)	34° 34' 00" S. 58° 26' 00" W. Gulf of St. George	LIP	270	Government	300, 600	P G	N	0.60	6.00	
Cordoba ¹	45° 51' 20" S. 67° 28' 50" W. Cordoba	LNC	1,000	Army	—	O	X	—	—	
Corrientes LPC	31° 26' 00" S. 64° 11' 00" W. Corrientes	LPC	100	Ministerio de Obras Publicas	1,000	O	X	—	—	
Corrientes ¹	27° 27' 52" S. 58° 50' 38" W.	LIG	—	Navy	—	—	—	—	—	
Dársena Norte	North entrance to the Port of Buenos Aires	LIA	432	Navy	300, 600 , 800	P G ²	N	0.60	6.00	
Direccion General de Arsenales de Guerra (Director Gen. of Arsenals)	34° 35' 00" S. 58° 22' 10" W. Buenos Aires	LNA	40	Army	400	O	X	—	—	
Eldorado	34° 38' 00" S. 58° 24' 00" W.	LIT	—	Navy	—	—	—	—	—	
Faro San Antonio ¹ (S. Antonio Light)	Buenos Aires ¹ Buenos Aires 36° 18' 24" S. 56° 46' 25" W.	LJA	—	Navy	—	—	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs. Per Word.	Mini- mum Charge.	Remarks.
ARGENTINE RE-PUBLIC—<i>contd.</i>										
Rio Grande	Tierra del Fuego 53° 46' 30" S. 67° 46' 00" W.	LJF	270	Navy ..	300, 600	P G ..	2400 to 1200	0.60	6.00	
Rio Grande	Tierra del Fuego 53° 46' 30" S. 67° 46' 00" W.	LIS	270	Government ..	300, 600	P G ..	0600 to 1800	0.60	6.00	
Rio Santiago	La Plata 34° 50' 57" S. 57° 51' 53" W.	LIB	—	Government ..	600	—	—	—	—	
Rio Santiago	Buenos Aires 34° 50' 20" S. 57° 53' 45" W.	LIZ	270	Navy ..	600	O ..	N	—	—	
Rosario de Santa Fé	Buenos Aires 32° 52' 00" S. 60° 39' 00" W.	LPA	100	—	900	O ..	X	—	—	
San Julian ..	49° 17' 26" S. 67° 44' 40" W.	LIM	—	Government ..	300, 600	—	—	—	—	
San Julian ..	Santa Cruz 49° 17' 26" S. 67° 44' 40" W.	LJD	270	Navy ..	300, 600	P G ..	N	0.60	6.00	
Trelew ¹	—	LIB	—	Navy ..	—	—	—	—	—	
Tucuman ¹ ..	Tucuman 26° 51' 00" S. 65° 18' 00" W.	LNT	1,000	Army ..	—	O ..	X	—	—	
Ushuaia ..	Tierra del Fuego 54° 48' 50" S. 68° 20' 00" W.	LIH	324	Government ..	300, 600	P G ..	N	0.60	6.00	
Zarate ..	Buenos Aires 34° 06' 00" S. 59° 02' 00" W.	LIX	270	Navy ..	600 , 800.	O ..	X	—	—	
AUSTRALIAN COMMONWEALTH										
Adelaide ..	South Australia 34° 52' 00" S. 138° 31' 00" E.	VIA	450	Government ..	300, 450, 600 , 2,600	P G ⁴ ..	N	0.30 ^{1,2}	0.60 ^{2,3}	¹ For radiotelegrams to and from ships licensed by the Commonwealth of Australia and New Zealand Administrations ² For radiotelegrams ex-
Brisbane	Queensland 27° 25' 30" S. 153° 01' 45" E.	VIB	450	Government ..	300, 450, 600 ,	P G ⁴ ..	N	0.30 ^{1,2}	0.60 ^{2,3}	

Broome	Western Australia 18° 00' 00" S. 122° 12' 00" E.	VIO	450	Government	..	300, 450, 600	P G ⁵ ..	N	0.30 ^{1 3}	0.60 ^{2 3}	changed with ships other than those subject to the administration of Australia or of New Zealand
Cooktown	Queensland 15° 27' 45" S. 148° 15' 30" E.	VIC	450	Government	..	300, 450, 600	P G ⁵ ..	0600 to 2000 ⁶	0.30 ^{1 3}	0.60 ^{2 3}	³ Meteorological forecasts are transmitted free of charge by coast stations at following hours (Melbourne Time): Adelaide Radio 2130; Melbourne Radio 2100; Sydney Radio 0830 and 2030; Brisbane Radio 2200; Perth Radio 2300.
Darwin	Northern Territory 12° 27' 30" S. 136° 48' 30" E.	VID	450	Government	..	300, 450, 600	P G ⁵ ..	N	0.30 ^{1 3}	0.60 ^{2 3}	
Esperance	Western Australia 33° 51' 00" S. 121° 55' 00" E.	VIE	450	Government	..	300, 450, 600	P G ⁵ ..	0600 to 2000 ⁷	0.30 ^{1 3}	0.60 ^{2 3}	
Flinders Island	Tasmania 40° 01' 00" S. 147° 52' 00" E.	VIL	450	Government	..	300, 450, 600	P G ⁵ ..	0900 to 1200, 1400 to 1800, Sundays ⁸ and public holidays ⁹ closed ⁶ 0600 to 2000 ⁷	0.30 ^{1 3}	0.60 ^{2 3}	⁴ The station transmits time and weather signals (see International Time and Weather Signals)
Geraldton	Western Australia 26° 47' 00" S. 114° 36' 00" E.	VIN ^{4 7}	450	Government	..	300, 450, 600	P G ⁵ ..	0600 to 2000 ⁶	0.30 ^{1 3}	0.60 ^{2 3}	⁵ The station transmits weather forecasts when necessary or when requested by vessels
Hobart Radio	(Queen's Domain) 42° 51' 45" S. 147° 19' 30" E.	VIH	300	Government	..	300, 450, 600	P G ⁵ ..	0600 to 2000 ⁶	0.30 ^{1 3}	0.60 ^{2 3}	⁶ Mean time of the meridian 150° E. of Greenwich
King Island Radio	Tasmania 39° 55' 00" S. 143° 51' 00" E.	VZE	200	Government	..	300, 450, 600	P G ..	0900 to 1200, 1400 to 1800, Sundays ⁸ and public holidays ⁹ closed	0.30 ^{1 4}	0.60 ^{2 4}	⁷ Mean time of meridian 120° E. of Greenwich
Perth	Western Australia 32° 02' 00" S. 115° 50' 00" E.	VIP	400, 1,250 1,500	Government	..	300, 450, 600, 2,500	P G ³ ..	N	0.30 ^{1 3}	0.60 ^{2 3}	⁸ Mean time of meridian 142° 30' E. of Greenwich
Rockhampton	Queensland 23° 23' 45" S. 156° 33' 00" E.	VIR	450	Government	..	300, 450, 600	P G ⁵ ..	0900 to 1730 ⁸	0.30 ^{1 3}	0.60 ^{2 3}	
Roebourne	156° 33' 00" E. 20° 44' 15" S.	VIZ	—	Government	..	300, 450, 600	—	—	—	—	
Melbourne	117° 12' 15" E. 37° 50' 00" S.	VIM	450	Government	..	300, 450, 600	P G ^{3 4} ..	N	0.30 ^{1 3}	0.60 ^{2 3}	
Mount Gambier	144° 58' 30" E. 37° 50' 00" S.	VII	—	Government	..	300, 450, 600	—	—	—	—	
Sydney	New South Wales 33° 40' 00" S. 151° 00' 00" E.	VIS	400 1,500	Government	..	300, 450, 600, 2,500	P G ³ ..	N	0.30 ^{1 3}	0.60 ^{2 3}	
Thursday Island	Queensland, Torres Strait 10° 35' 15" S. 145° 13' 45" E.	VII	500	Government	..	600	P G ⁵ ..	N	0.30 ^{1 3}	0.60 ^{2 3}	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
AUSTRALIAN COMMONWEALTH—contd.										
Townsville ..	Meridian of Greenwich, Queensland 19° 15' 30" E. 146° 50' 00" E.	VIT	400 1,500	Government ..	300, 450, 600	P G ..	N	0.30 ^{1 3}	0.60 ^{2 3}	
Wyndham ..	Western Australia 15° 35' 00" S. 128° 18' 00" E.	VIW	450	Government ..	300, 450, 600	P G ..	0900 to 1800 Closed Sundays ⁷	0.30 ^{1 3}	0.60 ^{2 3}	
AUSTRIA										
Laerburg ..	Near Vienna	OHL	—	—	4,000, 6,500, 9,100	—	—	—	—	
BAHAMAS (See under BRITISH WEST INDIES)										
BATHURST (see under GAMBIA)										
BELGIAN CONGO										
Banana ..	Meridian of Greenwich, 06° 00' 21" S. 12° 27' 06" N.	ONA	—	Posts and Telegraph Office	300, 600	P G ..	Meridian of Greenwich, 0830 to 1000 1400 to 1600 holidays	0.30	—	
BELGIUM										
Anvers Radio (Antwerp)	Meridian of Greenwich, 51° 13' 42" N. 04° 24' 00" E. 50° 25' 00" N. 04° 25' 00" E.	OSA	100, 150	Government ..	500, 600	P G ..	N	0.40 ¹	4.00 ¹	¹ In the communications with the packet boats of the Belgian State making their passage between Ostende and Dover there is no special coast tax. The total wireless tax is 3 francs for 10 words or less and 20 centimes for each word over 10
Brussels ..	—	BAV	—	Army ..	1,400 1,680 c.w. 1,500 ³ 1,680	—	0715, 1315, 1815	—	—	² The call signal is assigned to the Belgium aerodromes. It is followed when necessary, by the name or number of the
Brussels (Royal Meteorological Institute)	—	OPO	—	—	900, 1,400	Aviation	0700, 2000	—	—	
Haren (Air Port of Brussels)	50° 25' 00" N. 04° 25' 00" E.	OPVH ⁴	—	—	1,400, 1,500 1,680	Aviation	X	—	—	
Ostende-Aerodrome (Ostend)	51° 12' 00" N. 02° 55' 03" E.	OPVO ²	—	—	300, 450, 600 , 800, 1,800	P G ..	N	0.40 ¹	4.00 ¹	
Ostende Radio (Ostend)	51° 13' 24" N. 02° 55' 06" E.	OST	Day 250, 500 Night 500, 1,000	Government ..	—	—	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Francs. Per Word.	Minimum Charge.	Remarks.
BRAZIL										
Amaralina ..	Meridian of Greenwich. Bahia .. 13° 01' 00" S. 38° 28' 00" W.	SPA	400	Government	300, 600, 1,000, 2,000	P G ..	N	0.60	6.00	¹ In the case of radio telegrams originating at or intended for the places named against the letter in reference, the charge for transmission between such places and the coast station is included in the coast tax
Anhatomirim ..	S. Catharina 27° 25' 32" S. 48° 34' 20" W.	SOD	600	Navy	600, 1,200, 2,000	O ..	—	—	—	(a) Bahia (San Salvador)
Armacão (Rio) ..	Rio de Janeiro Bay 22° 52' 57" S. 43° 08' 04" W.	SNW	50	Navy	300	O ..	—	—	—	(b) Rio de Janeiro
Babylonia (Rio) ..	Rio de Janeiro 22° 55' 40" S. 43° 10' 10" W.	SPY	—	Government	300, 600	—	—	—	—	(c) Rio de Janeiro or Campos
Cape S. Thomé (C. S. Thomé)	Rio de Janeiro (State) 22° 02' 00" S. 40° 58' 35" W.	SPT	750	Government	300, 600	P G ..	N	0.60	6.00	(d) Fernando de Noronha or Recife (Pernambuco)
Cruzeiro do Sul ² ..	District of Acre 7° 38' 28" S. 72° 36' 15" W.	SQC	400	Government	600, 3,000	— ³	1800 to 0600 ³	—	—	(e) Polotas or Rio Grande do Sul
Escola Naval (Rio) (Naval School)	23° 06' 45" S. 44° 19' 35" W.	SOV	50	Navy	300	O ..	—	—	—	(f) Santos
Escola Radio ⁴ (Rio) (Radio School)	Rio de Janeiro 22° 55' 40" S. 43° 10' 10" W.	SPE	200	—	300, 600	O ..	—	—	—	(g) Olinda or Recife (Pernambuco)
Fernando Nironha ..	32° 25' 12" W. 03° 50' 30" S.	SPN	1,000	Navy	300, 600, 1,800	O ..	N	0.60	6.00	² Interior station for public correspondence in the inland service
Fortaleza da Lage (Rio) (Ft. Lage)	Rio de Janeiro Bay 22° 46' 03" S. 43° 09' 00" W.	PTL	150	Navy	450, 600, 900	O ..	1100 to 1600, 2000 to 2100 ⁵	0.60	6.00	³ Provisionally closed
Fortaleza de Imbuhy (Rio) (Ft. Imbuhy)	Rio de Janeiro (State) 22° 57' 02" S. 43° 06' 56" W.	PTI	150	Navy	450, 600, 900	O ..	1100 to 1600, 2000 to 2100 ⁶	—	—	⁴ Fifth time belt west of the Greenwich belt
Fortaleza de Santa Cruz (Rio) (Ft. Sta. Cruz)	Rio de Janeiro Bay 22° 56' 03" S. 43° 08' 00" W.	PTC	150	Navy	450, 600, 900	O ..	1100 to 1600, 2000 to 2100 ⁶	—	—	⁵ Third time belt west of the Greenwich belt
										⁶ Corresponds with fixed stations only
										⁷ Fourth time belt west of the Greenwich belt

Fortaleza de S. João (Rio) (Ft. S. João)	PTJ	150	Navy	..	450, 600, 900	O	..	2000 to 2100 ^s	—	—
Ilha das Cobras (Rio) (Cobras I.)	SNI	150	Navy	..	600	O	..	—	—	—
Ilha de Boqueirão (Rio) (Boqueirão I.)	SNQ	50	Navy	..	300	O	..	—	—	—
Ilha de Governador (Rio) (Governador I.)	SOH	800	Navy	..	600, 1,200 1,800, 2,000	O	..	—	—	—
Ilha de Mocangá (Rio) (Mocangú I.)	SOQ	50	Navy	..	300	O	..	—	—	—
Ilha Raza (Rio) (Raza I.)	SNZ	150	Navy	..	600	O	..	—	—	—
Juncao	SPJ	750	Government	..	300, 600	P G	..	N	0.60	6.00
Labrea ² Ladario	SOL SNU	—	Government Navy	.. ..	—	—³	..	N —	— —	— —
Manãos ²	SQM	750	Government	..	2,400, 3,500	— ³	..	N	—	—
Mon't Serrat	SPS	200	Government	..	300, 600	P G	..	0600 to 2400 ^s	0.60	6.00
Natal, Norte	SNR	500	Navy	..	600	O	..	N	—	—
Nitheroy	PTN	150	Navy	..	450, 600, 900	O	..	1100 to 1600 2000 to 2100 ^s	—	—
Olinda	SPO	590	Government	..	300, 600	P G	..	N	0.60	6.00
Para (Belém)	SPB	750	Government	..	300, 600, 1,800	— ⁷	..	N	—	—
Porto Velho ²	SQV	750	Government	..	2,400, 3,500	— ³	..	N	—	—
Quartel General	PTQ	150	Navy	..	450, 600, 900	O	..	1100 to 1600 2000 to 2100 ^s	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
BRAZIL—contd.										
Rio Branco	Meridian of Greenwich. 09° 58' 28" S. 67° 52' 05" W.	SQR	210	Government	1,000, 2,000	— ³	1800 to 0600 ⁵	—	—	
Santarém	Para 02° 24' 48" S. 54° 42' 58" W.	SQS	400	Government	600, 2,000	— ³	1800 to 0600 ⁸	—	—	
Somma Madureira ²	District of Acre. 09° 03' 57" S. 68° 39' 35" W.	SQN	400	Government	1,500, 3,000	— ³	N	—	—	
Tarauacá ²	District of Acre 08° 20' 55" S. 70° 43' 30" W.	SQT	210	Government	1,500, 3,000	— ³	1800 to 0600 ⁵	—	—	
Villa Militar	Rio de Janeiro 22° 49' 27" S. 43° 24' 52" W.	PTV	150	Navy	450, 600, 900	O	1100 to 1600 2000 to 2100 ⁶	—	—	
Villegaignon	Rio de Janeiro Bay 22° 52' 00" S. 43° 09' 40" W.	SNV	27	Navy	300	O	—	—	—	
Xapury ²	District of Acre 10° 39' 10" S. 68° 36' 30" W.	SQX	210	Government	1,000, 2,000	— ³	1800 to 0600 ⁵	—	—	
BRITISH EAST AFRICA (See under KENYA COLONY AND PROTECTORATE, ZANZIBAR, AND PEMBA)										
BRITISH GUIANA										
Demerara	Meridian of Greenwich. 06° 49' 00" N. 58° 11' 00" W.	BZL	500 ¹	British Admiralty	600 ⁴ , 1,800 ² , 1,200, 2,200 ³ , 4,200 ³	P R	N ³	0.60	—	¹ 30 kW. spark and 25 kW. arc sets are fitted. ² Transmitting wave to Trinidad 2,200, receiving 1,800 metres. ³ Transmitting and receiving wavelength for Jamaica 4,200 with arc set ⁴ Other wavelengths for official use only

⁴ No official period can be specified. If a ship is unable to gain the attention of the station after calling twice in the usual way, the call should not normally be repeated until an interval of an hour has passed

¹ Traffic for the United States and United Kingdom is handled via the United Fruit Company's station at Swan Island
² This includes the charge for transmission over the telegraph lines of the colony

¹ Acts as a relay station for Belize, British Honduras, for traffic intended for the United States and United Kingdom

¹ Information regarding weather is broadcast at 0630 and 1830 (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time), on 2,000 metres wavelength. Navigational warnings are broadcast five minutes later on 600 metres wavelength
² During the daytime the station is largely occupied with inland communication.

³ Information regarding weather is broadcast at 0700, and 1900 (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time), on 2,000 metres wavelength. Navigational warnings are broadcast 15 minutes earlier on 600 metres wavelength

⁴ Each weather report from this station is immediately preceded by time signals on the Inter-

BRITISH HONDURAS

Meridian of Greenwich.
 17° 30' 39" N.
 88° 11' 20" W.

Belize ..

VPP

400
1,500

Government ..

600, 1,000,
1500, c.w.

P G¹ ..

N3

0.50°

5.00°

SWAN ISLAND

Swan Island ..

VS

United Fruit Co.

—

—¹

—

—

—

BRITISH INDIA

Meridian of Greenwich.
 81° 55' 00" E.
 25° 26' 00" N.

Allahabad Radio ..

VWA

—

Indian Government

2,300

—⁸

X

—

—

Bombay Radio ..

VWB

350

Indian Government

300, 600,
2,000

P G¹ ..

N²

0.60

—

Calcutta ..

VWC

350

Indian Government

300, 600,
2,000

P G³ ⁴

N²

0.60

—

Delhi Radio ..

VWD

—

—

2,700

—⁸

X

—

—

Diamond Island ..

VTD

350

Indian Government

300, 600

P G⁷ ..

N²

0.60

—

Jutogh Radio ..

VWJ

—

—

1,400, 2,300 ew.

—⁸

N

—

—

Karachi Radio ..

VWK

350

Indian Government

300, 600, 2,000

P G³ ..

0130 to 1330

0.60

—

Lahore Radio ..

VWL

—

—

1,900

—⁸

N

—

—

Madras / ..

VWM

350

Indian Government

300, 600, 2,000

P G¹ ..

N²

0.60

—

Maymyo Radio ..

VTM

—

—

3,000

—⁸

X

—

—

Mhow Radio ..

VWH

—

—

1,500, 2,300

—⁸

X

—

—

Nagpur Radio ..

VWN

—

—

2,600

—⁸

X

—

—

Pana Radio ..

VVP

—

—

2,100 c.w.

—⁸

X

—

—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
BRITISH INDIA <i>contd.</i>										
Peshawar Radio	71° 40' 00" E. 34° 02' 00" N.	VWP	—	—	1,800	— ⁸	N.	—	—	national system. (See International Time and Weather Signals)
Poona Radio	73° 50' 00" E. 18° 30' 00" N.	VVO	—	—	1,100 c.w.	— ⁸	X	—	—	³ Information regarding weather is broadcasted at 0700 and 1900 (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 1,200 metres wavelength.
Port Blair	South Adaman Island 92° 46' 00" E. 11° 40' 00" N.	VTP	350	Indian Government	400, 800, 1,200	P G ⁵ ..	N	0.60	—	Navigation warnings are broadcasted five minutes earlier on 600 metres wavelength
Quetta Radio	67° 00' 00" E. 30° 15' 00" N.	VWG	—	—	2,600	— ⁷	N	—	—	³ Information regarding weather is broadcasted at 0630 and 1830 (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 1,200 metres wavelength.
Rangoon	Lower Burma 96° 07' 00" E. 16° 47' 00" N.	VTR	350	Indian Government	300, 800, 1,200	P G ⁶ ?	N	0.60	—	Navigation warnings are broadcasted five minutes earlier on 600 metres wavelength
Sandheads	21° 00' 00" N. 88° 00' 00" E.	VWS	—	Indian Government	300, 600	—	—	—	—	³ Information regarding weather is broadcasted at 0630 and 1830 (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 1,200 metres wavelength.
Secunderabad Radio	78° 33' 00" E. 17° 32' 00" N.	VWX	—	—	3,000	— ⁸	X	—	—	Navigation warnings are broadcasted five minutes later on 600 metres wavelength
Victoria Point	Extreme South of Lower Burma 98° 32' 30" E. 09° 59' 00" N.	VTV	350	Indian Government	300, 800, 700	P G ..	N ²	0.60	—	¹ When Rangoon Radio is occupied with inland traffic ships should communicate with Diamond Island ² Communicates with fixed stations only
BRITISH NORTH BORNEO										
Jesselton	Meridian of Greenwich. 5° 56' 50" N. 116° 03' 10" E.	VQA	400	Government	300, 450, 600, 1,200, 2,800	P G ..	Hong Kong Zone Time 120° E. 0800 to 1100 1400 to 1700 (2000 to 2200) ³	0.40	—	¹ The station sends out time signals at 0800 (local time). (See International Time and Weather Signals) ² Hong Kong zone time
Kudat	6° 52' 40" N. 116° 50' 15" E.	VQD	400	Government	300, 450, 600, 1,200, 2,800	P G ..	0800 to 1100 1400 to 1700 (2000 to 2200) ³	0.40	—	

³ If necessary
⁴ During part of these periods the station may be engaged in point to point working

Sandakan	05° 50' 00" N. 118° 07' 00" E.	..	400	Government	..	300, 800	PG ¹	0800 to 1100 1400 to 1700 (2000 to 2200) ²	0.40	—	—
Tawao	04° 14' 40" N. 117° 54' 00" E.	..	400	Government	..	300 450, 600, 1,200, 2,800	PG	0800 to 1100 1400 to 1700 (2000 to 2200) ³	0.40	—	—
SARAWAK	Meridian of Greenwich.	..	80	Government	..	600	PG	Local Time. 0800 to 1100	0.40	2.00	—
Goebilt	111° 27' 30" E.	..	500	Government	..	600, 1,000,	PG ¹	1300 to 1600 ⁴	0.40	2.00	—
Kuching	01° 37' 50" E.	..	300	Government	..	1,500, 1,800	PG	0800 to 1800 ⁴	0.40	2.00	—
Miri	110° 20' 35" E.	..	150	Government	..	600, 1,800	PG ¹	0800 to 1800 ⁴	0.40	2.00	—
Sadong	01° 33' 20" N.	..	300	Government	..	600	PG	0800 to 1100	0.40	2.00	—
Sibu	114° 07' 00" E.	..	300	Government	..	600, 1,800	PG	0800 to 1100	0.40	2.00	—
BRITISH SOMALI- LAND	Meridian of Greenwich.	..	250	Government	..	300, 600	PG	Mean Time of Aden ⁴	0.60 ³	—	—
Berbera	10° 26' 00" N.	..	—	Government	..	600	—	0600 to 1800 2000 to 2030	—	—	—
Bulhar ³	45° 01' 30" E.	..	—	Government	..	600	—	—	—	—	—
Burao	10° 22' 00" N.	..	—	Government	..	600	—	—	—	—	—
Hargeisa	44° 21' 00" E.	..	—	Government	..	600	—	—	—	—	—
Las Dureh	09° 35' 00" E.	..	—	Government	..	600	—	—	—	—	—
	45° 33' 00" E.	..	—	Government	..	600	—	—	—	—	—
	09° 30' 00" N.	..	—	Government	..	600	—	—	—	—	—
	44° 05' 00" E.	..	—	Government	..	600	—	—	—	—	—
	10° 20' 00" N.	..	—	Government	..	600	—	—	—	—	—
	46° 00' 00" E.	..	—	Government	..	600	—	—	—	—	—
BRITISH WEST INDIES (BAHAMAS)	Meridian of Greenwich.	..	200	Government	..	450, 800, 900	PG	Mean Time of the Meridian 75° W. of Greenwich.	0.30	—	—
Bimini	79° 19' 00" W.	..	125	Government	..	450, 600	PG	0700 to 2100	—	—	—
Governors Harbour	25° 44' 00" N.	..	125	Government	..	450, 600	PG	0700 to 2100	—	—	—
Harbour Island	25° 12' 00" N.	..	125	Government	..	450, 600	PG	0700 to 2100	—	—	—
Hopetown	76° 16' 00" W.	..	—	Government ¹	..	—	—	—	—	—	—
Inagua	25° 30' 00" W.	..	200	Government	..	400, 600, 900	PG	0700 to 1400 1900 to 2100	0.30	—	—
Nassau	26° 30' 00" W.	..	400	Government	..	600, 1,000, 1,600	PG	0700 to 2100	—	—	—
Normans Castle	73° 41' 00" W.	..	—	Government ¹	..	—	—	—	—	—	—
West End Bahamas	25° 05' 00" N.	..	—	Government ¹	..	—	—	—	—	—	—
	77° 22' 30" W.	..	—	Government ¹	..	—	—	—	—	—	—
	77° 10' 00" N.	..	—	Government ¹	..	—	—	—	—	—	—
	26° 34' 00" W.	..	—	Government ¹	..	—	—	—	—	—	—
	79° 00' 00" N.	..	—	Government ¹	..	—	—	—	—	—	—
	20° 40' 00" W.	..	—	Government ¹	..	—	—	—	—	—	—

¹ For inland service communication
² In the case of radio-telegrams neither originating at nor intended for Berbera itself, the coast charge is included in the charge for transmission between Aden and Berbera
³ Temporarily closed
⁴ Three hours in advance of Greenwich time

¹ The station sends out a weather bulletin at 0100 and 1300 (Greenwich mean time) on a wavelength of 1,200 metres. It also issues, when necessary, at the same time a hydrographic message
In the case of radio telegrams originating at or intended for Port of Spain (Trinidad) or Scarborough (Tobago) the charge for transmission between the coast station and either of these places

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
BRITISH WEST INDIES										
BAHAMAS— <i>contd.</i>										
Barbados ..	Meridian of Greenwich. 13° 04' 35" N. 59° 36' 27" W.	VPO	200	—	300, 600	P G ..	N ^a	0.60	—	is included in the coast charge. Coast station gives any information on the charges for other destinations ^a The coast charge is reduced to 15 centimes per word with a minimum of 1 fr. 50 c. for messages exchanged with the ss. "Belize" while that vessel is plying between Trinidad and Tobago ⁴ The station also exchanges public and official correspondence with Trinidad ⁵ The station is closed on Sundays and holidays from 0600 to 1800 (Greenwich mean time)
JAMAICA	Jamaica	BZQ	500	Admiralty	1,200, ¹ 4,200 600	O ¹ P G ..	X	—	—	
Christiana	Jamaica	VQI	100	—				0.60	—	
Kingston ..	17° 57' 41" N. 76° 40' 39.8" W.									
TRINIDAD	11° 12' 00" N. 60° 40' 00" W.	VPM	300	Government	600	P G ⁴ ..	Local Time 0800 to 1700 2200 to 2215	0.60 ^{2,3}	—	
Toco ..	Trinidad 10° 50' 00" N. 60° 55' 00" W.	VQG	150	Government	600	O ..	—	—	—	
Trinidad ..	10° 40' 00" N. 61° 30' 00" W.	VPL	350	Government	600 , 1,800	P G ..	N	0.60 ^{2,3}	—	
WINDWARD PASSAGE										
Navassa Islands ^{1,2}	Meridian of Greenwich. 18° 24' 00" N. 74° 01' 00" W.	NKC	150	U.S. Dept. of Commerce	300, 600	P G ..	N	0.30	—	¹ The accounts are settled by the United States Navy ² United States Department of Commerce
BULGARIA										
Sofia ..	Meridian of Greenwich. 42° 38' 00" N. 23° 15' 00" E.	FF	—	—	900, 3,200	—	—	—	—	Eastern European Time. — 0900 to 1200 1400 to 1800
Varna ..	43° 12' 00" N. 27° 55' 00" E.	LZF	270	Government	300, 600	P G ..		0.30	3.00	

Meridian of	VAF	350	Government, Naval	300, 600, 1,600	P G ¹	N	0.50 ²	1 Weather forecasts transmitted free of charge on request. Messages concerning navigation to any department or officer of the Government handled free of coast tax. Weather and ice reports from captain of a vessel also free of coast charge.
Alert Bay ¹⁵ ..								
Anticosti Island ..	FQ	50	Gaston Menier, Anticosti Island, Quebec	1,600	—	—	—	
Barrington Passage ..	VAL	2,000	Dept. of Marine and Fisheries	1,600, 2,200, 4,200	P G	N	0.52	
Bear Trap Camp ..	FF	25	Col. Thomas Cantley, N.S.	400	—	—	—	
Bhubber Bay ..	FP	100	New Glasgow, N.S.		—	—	—	
Buckley Bay ..	DD	100	Pacific Lime Co., Vancouver, B.C.	600	—	—	—	
Bull Harbour ..	VAG	250	Massett Timber Co., Vancouver, B.C.	600	—	—	—	
Burlington ..	FO	65	Government, Naval	300, 600, 1,600	P G ¹	N	0.60 ²	
Calgary ⁷ ..	CFAC	200	Toronto Power Co., Toronto, Ont.	1,650	—	—	—	
Calgary ⁷ ..	CFCN	250	Radio Corp. of Calgary, Alberta	430	—	—	—	
Calgary ⁷ ..	CHBC	200	W. W. Grant Radio, Ltd., 511, Loughheed Bldg., Calgary, Alta	440	—	—	—	
Calgary ⁷ ..	CHCQ	100	Alberta Pub. Co., Ltd., 229, Eighth Avenue, W. Calgary, Alta	410	—	—	—	
Camp Borden ..	VAY	—	Western Radio Co., Ltd., Herald Bldg., Calgary, Alta	400	—	—	—	
Camperdown ..	VCS	250	Dominion Government	—	O	—	—	
Canso ..	VAX	150	Canadian Government	300, 600	P G ¹ ..	N	0.30 ³	
				800 ¹²	P G, D F	N	—	

¹ Weather forecasts transmitted free of charge on request. Messages concerning navigation to any department or officer of the Government handled free of coast tax. Weather and ice reports from captain of a vessel also free of coast charge.

² For radio telegrams sent by or addressed of the commander of a ship relating to the service of the ship the coast charge is reduced to fcs. 0.25 per word. The preamble of such messages should contain the service instruction S.B.

³ Cape Sable and Sable Island communicate with the land telegraph system through Camperdown. The retransmission charge between these stations and Camperdown is fcs. 0.30 per word. This charge is additional to the ordinary radio and land line rates.

⁴ Not yet in operation.

⁵ For radiotelegrams sent for or addressed to ships engaged in the local service between Victoria, Vancouver and Seattle, the coast charge is fcs. 0.15 per word. The preamble of such radiotelegrams should contain the service instruction F.B.

⁶ Station sends out messages concerning ice dangers and weather. (See International Time and Weather Signal Station)

⁷ Broadcasting station.

⁸ The station is open only during the season of navigation, approximately April to December.

⁹ Weather, ice and other reports transmitted daily.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
CANADA—contd.										
Cape Bear ¹⁴ ..	Meridian of Greenwich. Prince Edward Island 46° 00' 45" N. 62° 27' 15" W.	VCP	150	Dept. of Marine and Fisheries ¹⁵	300, 600	P G ¹ ¹⁶	April to November 0800 to 0800	0.15	—	at 0130 and 1330 (G.M.T.) ¹⁰ For regulations relating to W/T D.F. stations, see under Canada in D.F. Section ¹¹ The station broadcasts press to ships subscribing to service ¹² The station keeps watch, takes bearings, and transmits on the 800 metres wavelength ¹³ The station also communicates with Campdown (Nova Scotia) ¹⁴ The station is provisionally closed
Cape Lazo ¹⁵ ..	British Columbia, east coast of Vancouver Island 40° 42' 20" N. 124° 52' 43" W.	VAC	350	Government, Naval	300, 600	P G ¹ ..	N	0.50 ^{2, 6}	—	
Cape Sable ..	Nova Scotia 43° 23' 20" N. 65° 37' 15" W.	VCU	250	Government ..	300, 600	P G ¹ ^{9, 13, 16}	N	0.85 ³	—	
Chebucto Head ..	Nova Scotia 44° 30' 01" N. 63° 31' 20" W.	VAV	150	Canadian Government	800	D F ⁶ ..	N	—	—	
Clarke City ..	Province of Quebec, North shore of River St. Lawrence 50° 11' 00" N. 66° 37' 15" W.	VCK	250	Government ¹⁸ ..	300, 600	P G ¹ ¹³	N ⁸	0.30	—	¹⁷ The accounts are settled by the Divisional Superintendent, B. C. Division, Government Radiotelegraph Service, Victoria, B.C.
Dead Tree Point ..	British Columbia (Graham Island) 53° 21' 30" N. 131° 55' 55" W.	VAH	200	Government, Naval	300, 600 , 1,600	P G ¹ ..	0800 to 1800 ⁷	0.50 ²	—	¹⁸ These coast Radiotelegraph stations handle the following messages appertaining to the navigation of any ship without charges, viz:— (a) between the captain of the ship and any Government department or Government official. (b) Between the captain of the ship and the officer in charge of any radiotelegraph station. (c) Between the captain of the ship and any person whatever in connection with
Digby Island ¹⁵ ..	British Columbia Prince Rupert 54° 17' 02" N. 130° 22' 33" W.	VAJ	250	Government, Naval	300, 600 , 1,600	P G ¹ ..	N	0.50 ²	—	
Edmonton ¹ ..	Alberta	CJCA	150	The Edmonton Journal, Ltd., Journal Bldg.	450	—	—	—	—	
Edmonton ^{7, 4} ..	Alberta	CHCC	—	Canadian Westinghouse Co., Ltd., Hamilton, Ont.	400	—	—	—	—	

the following:—1. Weather conditions and forecasts. 2. Tide conditions. 3. Ice. 4. Reports on Aids to Navigation as Operated by the Marconi Wireless Telegraph Co., of Canada, under contract									
Edmonton ..	Alberta	DU	—	Bert L. Perry, 10033-102nd St. Edmonton, Alberta	2,000	P G ..	X	—	—
Ellis Bay ..	Anticosti Island, Quebec	GB	—	—	—	—	—	—	—
Ellis Bay ..	Anticosti Island, Quebec	FR	50	Gaston Menier ..	1,600	—	—	—	—
Estevan ..	British Columbia, W. Coast of Vancouver Island 49° 22' 05" N. 126° 32' 22" W.	VAE	500	Government, Naval	300, 600, 1,600	P G ¹ ..	N	0.50 ²	—
Fame Point ..	Province of Quebec, Gulf of St. Lawrence 49° 06' 50" N. 64° 36' 20" W.	VCG	250	Government ¹⁸ ..	300, 600	P G ¹ 0.16	N ⁸	0.30	—
Father Point ..	Province of Quebec, S. Shore of River St. Lawrence 48° 31' 00" N. 68° 27' 40" W.	VCF	250	Government ¹⁸ ..	300, 600	P G ¹ ..	N ⁸	0.15	—
Fort Frances ² ..	Ontario	CFPC	25	International Radio Develop- ment Co. Bert L. Perry, 10033-102nd St., Edmonton, Alberta	400	—	—	—	—
Fort Smith ..	Alberta	FB	—	—	2,000	—	—	—	—
Glace Bay ..	Nova Scotia	DO	—	Marconi Wireless Telegraph Co. of Canada, Mon- treal, Quebec	3,000	P R ..	N	—	—
Glace Bay ..	Nova Scotia	GB	3,000	Marconi Wireless Telegraph Co. of Canada, Mon- treal, Quebec	7,925	P R ..	N	—	—
Glace Bay ..	Nova Scotia, Cape Breton Island 46° 08' 00" N. 59° 55' 00" W.	VAS	—	Marconi Co. of Canada	2,800	Q ¹¹ ..	—	—	—
Conzales Hills ¹⁵ ..	British Columbia, Victoria 48° 24' 50" N. 123° 19' 25" W.	VAK	250	Government, Naval	300, 600, 1,600	P G ¹ 16	N	0.50 ²	—
Gouin Dam ..	Quebec	DW	200	Shawinigan Water and Power Co., Montreal, Quebec	1,900	—	—	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
CANADA—contd.										
Grindstone Island ¹⁹	Meridian of Greenwich. Gulf of St. Lawrence, Magdalen Islands 47° 23' 00" N. 61° 54' 20" W.	VCN	200	Government ¹⁸ ..	300, 600	P G ¹⁸ ..	N	0.30	—	
Grosse Isle ..	Quebec, River St. Lawrence 47° 02' 00" N. 70° 40' 05" W.	VCD	100	Government ¹⁸ ..	300, 600	P G ¹⁸ ..	N.	0.15	—	
Halifax ..	Nova Scotia	CFCE	150	Marconi Wireless Telegraph Co. of Canada	440	—	—	—	—	
Halifax ⁴⁷ ..	Nova Scotia	CJCS	150	Eastern Telephone and Telegraph Co., Ltd. 84, Hollis Street, Halifax, N.S.	410	—	—	—	—	
Halifax ..	Nova Scotia, at Campdown 44° 31' 10" N. 63° 32' 40" W.	VCS	250	Department of Marine and Fisheries ¹⁸	600	— ¹⁸	N	—	—	
Halifax Dockyard ¹⁴	Nova Scotia 44° 39' 30" N. 63° 35' 10" W.	VAA	—	Government ..	—	O ..	—	—	—	
Hamilton ..	Ontario	DZ	50	Wood, Alexander & James, Toronto	1,550	—	—	—	—	
Hamilton ⁴⁷ ..	Ontario	CHIC	—	Canadian Westinghouse Co., Hamilton	400	—	—	—	—	
Hamilton ..	Ontario	CKOC	15	Wentworth Radio Supply Co., 31, John Street, Hamilton	410	—	—	—	—	
Harrington ..	Quebec, Gulf of St. Lawrence 50° 29' 39" N. 59° 27' 45" W.	VCJ	150	Marconi Co. of Canada	300, 600	P G ¹ ..	N ⁸	0.30	—	

Heath Point Lightship	VCI	150	Government ¹⁸	300, 600, 800	¹⁶	The first half of every odd hour from 0700 to 1900 and from 2200 to 2230 ⁸	—
Quebec 49° 05' 20" N. 61° 42' 16" W.							
High River ..	VAW	—	Dominion Govern- ment	—	O ..	—	—
Ikeda Head ..	VAI	—	Government ..	300, 600	—	—	—
Iroquois Falls ..	DS	20	Abitibi Power and Paper Co., Mon- treal, Quebec	1,590	—	—	—
Iroquois Falls ⁷	CFCH	75	Abitibi Power and Paper Co., Mon- treal, Quebec	400	—	—	—
Kingston ..	VBH	350	Government ¹⁸ ..	300, 600, 1,600	P G ¹⁷	N ⁸	0.15
Barriefield Common, Ontario							
Le Pas ¹⁴ ..	CJCF	25	New Records, Ltd., 39, Stn. Cameron Street, Ontario	420	—	—	—
Manitoba 53° 52' 45" N. 101° 21' 30" W.	VBM	600	Government ..	900, 1,800, 2,400	O ¹⁴ ..	X	—
London ⁴⁷ ..	CFCX	—	The London Adver- tiser	430	—	—	—
London ⁴⁷ ..	CHCS	100	London Radio Shops, 37, Or- chard St., London, Ontario	410	—	—	—
London ⁷ ..	CJGC	75	London Free Press Printing Co., Ltd.	430	—	—	—
London ⁷ ..	CKQC	50	Radio Supply Co. of London	410	—	—	—
Louisburg ..	VAS	1,500	Marconi Wireless Telegraph Co. of Canada	2,200, 2,800	P R ..	N	—
Nova Scotia							
Lurcher Shoal Light- ship	VDR	100	Government ¹⁸ ..	300, 600, 800	O ⁶ ..	The first half of every odd hour from 0700 to 1900 and 2200 to 2230 through the year	—
Nova Scotia, off Lurcher Shoal 43° 49' 30" N. 66° 32' 00" W.							
Maisonneuve ..	DH	200	Shawinigan Water and Power Co., Montreal	1,900	—	—	—
Mansel Island ..	VBO	—	Government ..	—	—	—	—
Margaret Bay ..	DL	100	Western Packers, Ltd., Vancouver B.C.	600, 2,000	—	—	—
British Columbia							

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Francs.	Remarks.
								Per Word.	Minimum Charge.
CANADA—contd.									
Markham ..	Ontario	DQ	—	Marconi Wireless Telegraph Co. of Canada	3,300	P R ..	X	—	—
Midland ..	Georgian Bay, Ontario 44° 44' 40" N. 79° 51' 45" W.	VBC	350	Government 18 ..	300, 600, 1,600	P G 117	N ⁸	0.15	—
Montreal 7 ..	Quebec	CFCF	150	Marconi Wireless Telegraph Co. of Canada	440	—	—	—	—
Montreal 47 ..	Quebec	CFZC	—	Canadian Westinghouse Co., Ltd.	400	—	—	—	—
Montreal 47 ..	Quebec	CKAC	250	La Presse Pub. Co., corner S. James' and St. Lawrence Boulevards	430	—	—	—	—
Montreal 7 ..	Quebec	CJBC	150	Depin's Freres, 447, St. Catharine Street	420	—	—	—	—
Montreal 47 ..	Quebec	CKCS	250	Ball Telephone Co. of Canada	—	—	—	—	—
Montreal 7 ..	Quebec	CHCX	50	B. L. Silver Summer Bldg.	420	—	—	—	—
Montreal 47 ..	Quebec	CHYC	250	Northern Electric Co.	410	—	—	—	—
Montreal ..	Quebec	FC	—	Marconi Wireless Telegraph Co. of Canada	13,150	P R ..	N	—	—
Montreal 15 ..	Quebec	VCA	200	Government ..	300, 600	P G 116	N ⁸	0.15	—
Nelson 7 ..	British Columbia	CJCB	50	James Gordon Bennett, 200 Block, Baker St., Nelson	400	—	—	—	—
New Glasgow ..	Nova Scotia	FG	25	Col. Thomas Cantley	400	—	—	—	—
Niagara Falls ..	Ontario	FK	65	Toronto Power Co.	1,650	—	—	—	—
North Sydney ..	Nova Scotia 46° 13' 10" N. 60° 14' 50" W.	VCO	200	Government 18 ..	300, 600	P G 116	N	—	0.30

Ocean Falls ..	British Columbia ..	CD	150	Pacific Mills, Ltd., Vancouver, B.C.	600, 1,600	—	—	—	—
Ottawa ⁷ ..	Ontario ..	CHXC	50	J. R. Booth, Jr., Rosborough, Apts., Ottawa	400	—	—	—	—
Pachena Point ¹⁵ ..	W. Coast of Vancouver Island 48° 43' 40" N. 125° 06' 20" W.	VAD	300	Government, Naval	300, 600	P G ¹⁴	N	0.50 ²	—
Partridge Island ..	New Brunswick 45° 14' 03" N. 66° 03' 05" W.	VCV	—	Government ..	300, 600	—	—	—	—
Pictou ..	Nova Scotia 45° 41' 01" N. 62° 42' 21" W.	VCQ	—	Government ..	300, 600	—	—	—	—
Point Edward ..	Ontario, to the South of Lake Huron 43° 00' 10" N. 83° 24' 55" W.	VBE	350	Government ¹⁸ ..	300, 600, 1,600	P G ¹¹⁷	N ⁸	0.15	—
Point Grey ¹⁵ ..	British Columbia near Vancouver 49° 15' 57" N. 123° 15' 22" W.	VAB	150	Government, Naval	300, 600, 1,600	P G ¹ ..	N	0.50 ²	—
Port Alice ..	British Columbia ..	DK	100	Whalen Pulp and Paper Co., Van- couver, B.C.	600	—	—	—	—
Port Arthur ..	Ontario, Lake Superior, Thunder Bay, 48° 26' 30" N. 89° 13' 45" W.	VBA	350	Government ¹⁸ ..	300, 600, 1,600	P G ¹¹⁶	N ⁸	0.15	—
Port Burwell ..	Ontario, Lake Erie, 42° 38' 35" N. 80° 47' 14" W.	VBF	350	Government ¹⁸ ..	300, 600, 1,600	P G ¹¹⁷	N ⁸	0.15	—
Port Credit ..	Ontario ..	FM	—	Toronto Power Co., Toronto	1,650	—	—	—	—
Port Nelson ..	Hudson Bay, Manitoba, Mouth of Nelson River 57° 03' 20" N. 92° 34' 30" W.	VBN	150, 600	Government ..	300, 600, 1,800	P G ¹⁴ ..	N	0.60	—
Quebec ..	Quebec ..	DX	200	Shawinigan Water and Power Co., Montreal, Quebec	1,900	—	—	—	—
Quebec ¹³ ..	Port of Quebec 46° 48' 25" N.; 71° 12' 25" W.	VCC ^{21 10}	150	Government ¹⁸ ..	300, 600	P G ¹¹⁶	N	0.15	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
CANADA—contd.										
Polytechnic ..	Meridian of Greenwich.	YI	—	Billings Polytechnic Institute	200, 375	—	—	—	—	
Polytechnic ..	Montreal	ZU	—	Glen E. West ..	—	—	—	—	—	
Quebec ..	Montreal 49° 03' 00" N. 61° 30' 30" W.	VCI	—	—	800, 800	DF ..	The first half hour of every odd hour between 0700 and 1900 inclusive and from 1000 to 2200	—	—	
Regina ? ..	Saskatchewan	CKCK	200	Leader Pub. Co. of Regina, Ltd., Regina, Saskatchewan Government ¹⁸ ..	420	—	—	—	—	
Sable Island ..	Nova Scotia 43° 56' 20" N. 60° 01' 40" W.	VCI	300	Government ¹⁸ ..	300, 800	P G ¹ 16	N	0.85 ³	—	
Sault Ste. Marie ..	Ontario 46° 31' 05" N. 84° 17' 50" W.	VBB	350	Government ..	300, 800, 1,600	P G ¹ 17	N ⁸	0.15	—	
Shawinigan Falls ..	Quebec	DG	200	Shawinigan Water and Power Co., Montreal, Quebec Canadian Government	1,475, 1,900	—	—	—	—	
St. John ..	New Brunswick 45° 15' 03" N. 66° 00' 47" W.	VAR	250	McLean, Holt & Co., Ltd., St. John, N.B.	600, 4 800 ⁴	P G, D F ¹⁰	N	0.30	—	
St. John? ..	New Brunswick	CJCI	75	Jones Electric Radio Co., 30, Charlotte St., St. John	400	—	—	—	—	
St. John? ..	New Brunswick	CKCR	50	Whalen Pulp and Paper Co., Ltd., Vancouver, B.C.	400	—	—	—	—	
Swanson Bay ..	British Columbia	DA	150	Shawinigan Water and Power Co.	600	—	—	—	—	
Thetford Mines ..	Quebec	DY	200	Whalen Pulp and Paper Co., Ltd., Vancouver, B.C.	1,475, 1 900	—	—	—	—	
Thurston Harbour ..	British Columbia	DJ	100	Whalen Pulp and Paper Co., Ltd., Vancouver, B.C.	800	—	—	—	—	

Tobemory ..	Ontario, Entrance of Georgian Bay 45° 15' 55" N; 81° 39' 40" W.	VBD	350	Government 18 ..	300, 600, 1,600	P G 117	N 8	0.15	
Toronto ⁷ ..	Ontario	CFCA	250	Star Publishing & Printing Co., 18, King St. W., Toronto, Ontario	400	—	—	—	—
Toronto ⁷ ..	Ontario	CFTC	250	Bell Telephone Co. of Canada, Mon- treal, Quebec	—	—	—	—	—
Toronto ⁷ ..	Ontario	CHCB	150	Marconi Wireless Telegraph Co. of Canada	440	—	—	—	—
Toronto ⁷ ..	Ontario	CHCZ	—	The Globe Printing Co., Yonge and Malinda Streets, Toronto	420	—	—	—	—
Toronto ⁷ ..	Ontario	CHVC	25	Metropolitan Motors, Ltd., Temperance St., Toronto, Ont.	410	—	—	—	—
Toronto ⁷ ..	Ontario	CJCD	10	T. Eaton Co., Ltd., Toronto, Ont.	410	—	—	—	—
Toronto ⁷ ..	Ontario	CJCH	—	United Farmers of Ontario, 130, King Street, E. Toronto, Ont.	410	—	—	—	—
Toronto ⁷ ..	Ontario	CJCN	250	Simons Agency & Co., McKin- non Bldg., 19, Melinda Street, Toronto, Ont.	410	—	—	—	—
Toronto ⁷ ..	Ontario	CJSC	150	Evening Telegraph, 81, Bay Street, Toronto, Ont.	430	—	—	—	—
Toronto ⁷ ..	Ontario	CKCE	250	Canadian Inde- pendent Tele- phone Co., Wallace Avenue and Wards St., Toronto, Ont.	450	—	—	—	—
Toronto ⁴⁷ ..	Ontario	CKCZ	—	Canadian Westing- house Co., Ltd., Hamilton, Ont.	420	—	—	—	—
Toronto ⁴⁷ ..	Ontario	CKKC	50	Radio Equipment and Supply Co., Toronto, Ont.	410	—	—	—	—
Toronto ..	Ontario	FH	50	Wood, Alexan- der & James, Toronto Ont	1,500	—	—	—	—
Toronto ..	Ontario	FN	65	Toronto Power Co., Toronto, Ont.	1,650	—	—	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
CANADA—cont.										
Toronto ..	Meridian of Greenwich. Lake Ontario, Toronto Island 43° 36' 50" N. 79° 23' 10" W.	VBG	350	Government	300, 600, 1,600	P G ¹¹⁷	N ⁸	0.15	—	
Triangle Island ..	50° 51' 48" N. 129° 04' 50" W.	VAG	—	Government	300, 600	—	+	—	—	
Twenty Mile Creek ..	Ontario	FL	30	Toronto Power Co., Toronto, Ont.	1,650	—	—	—	—	
Twin Falls ..	Ontario	DT	20	Abitibi Power and Paper Co., Mon- treal	1,590	—	—	—	—	
Vancouver ? ..	British Columbia	CFCB	150	Marconi Wireless Telegraph Co. of Canada	440	—	—	—	—	
Vancouver ? ..	British Columbia	CFYC	100	V. W. Odlum, David Spencer Bldg., Vancouver	400	—	—	—	—	
Vancouver ? ..	British Columbia	CHCA	200	Radio Corp. of Vancouver, Ltd.	430	—	—	—	—	
Vancouver ? ..	British Columbia	CHOC	—	Vancouver, B.C. Canadian Westing- house Co., Ltd., Hamilton, Ont.	400	—	—	—	—	
Vancouver ? ..	British Columbia	CJCE	150	Vancouver Sun Radio Tele- phones, Ltd., Vancouver, B.C.	420	—	—	—	—	
Vancouver ..	British Columbia	FJ	200	Vancouver Mer- chant Exchange, Vancouver	2,000	—	—	—	—	
Victoriaville ..	Quebec	DV	200	Shawinigan Water and Power Co., Mont., Quebec	1,900	—	—	—	—	
Walkerville ? ..	Ontario	CFCI	250	Motor Products Corp., Corps, Walker Rd. and Seminole St.	440	—	—	—	—	
Winnipeg ? ..	Manitoba	CPCD	—	Canadian Westing- house Co., Ltd., Hamilton, Ont.	440	—	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
CHILE—contd.							Chilian Standard Time ² , 8-10 13-15, 20-22			
Huato ⁴ ..	Meridian of Greenwich. Province of Llanquihue Huato Island 43° 33' 37" S. 74° 49' 30" W.	CCQ	250	Government ..	300, 600 , 1,300	P G ..	—	0.60	—	
Juan Fernandez ⁴ ..	Juan Fernandez Island 33° 37' 00" S. 78° 53' 00" W.	CCJ	250	Government ..	600	P G ..	0900 to 1100 1400 to 1600 2100 to 2300	0.60	6.00	
Las Torpederas ..	Near Valparaiso	CCV	—	Navy Department	—	— ^s	—	—	—	
Llanquihue ..	41° 32' 00" S. 72° 55' 00" W.	CCL	—	Government ..	600 , 2,500, 3,500, 5,000	—	—	—	—	
Llanquihue ..	41° 32' 00" S. 72° 55' 00" W.	CCO	2,000	Government ..	3,500 , 5,000	—	—	—	—	
Llanquihue ..	—	CCU	—	—	3,600	—	—	—	—	
Mocha (La) ⁴ ..	73° 53' 44" W. 38° 22' 12" S.	CCN	200	—	300, 600	P G ..	7-9, 12-14, 19-21	—	—	
Punta Arenas Apostadero ³ ..	53° 10' 00" S. 70° 50' 00" W.	CCX	—	—	300, 600 , 1,300	P R ..	—	—	—	
Punta Arenas ..	53° 10' 00" S. 70° 50' 00" W.	CCP	2,000	3,600	600, 2,500, 3,500 , 5,000	—	—	—	—	
Raper ⁴ ..	Tai-tao Peninsula	CCS	250	Government ..	300, 600 , 1,300	P G ..	0900 to 1100 1400 to 1600 2100 to 2300	0.60	6.00	
Rio Aysen ¹ ..	75° 37' 30" W. 46° 49' 45" S.	CCR	—	—	300, 600 , 1,300	P R ..	—	—	—	
Santiago Espejo ..	75° 37' 30" W. 46° 49' 45" S.	CCI	—	—	—	Aviation	—	—	—	
Santiago Moneda ..	70° 38' 10" W. 33° 26' 00" S.	CCG	300	—	300, 600 , 1,300	O ..	—	—	—	
Santiago Universidad (University)	70° 38' 10" W. 33° 26' 00" S.	CCH	—	—	—	Studies	—	—	—	
Talcahuo Escuela de Torpedos (Torpedo School)	73° 05' 35" W. 36° 44' 00" S.	CCL	250	—	300, 600 , 1,300	Control	N	0.60	6.00	

Talkino Recount	73° 05' 35" W.	700	—	300, 600, 1,300	P G	N	0.00	0.00	Communicates with other coast stations in China
Valparaiso, P. Ancha ¹	36° 44' 06" S.	300	Naval	300, 600, 1,000, 1,300	P G	N	0.60	6.00	
Valparaiso	33° 01' 06" S.	300	Government	300, 600, 1,300	P G	N	0.60	6.00	
	71° 38' 06" W.								
	33° 01' 06" S.								
	71° 38' 06" W.								
CHINA	Meridian of Greenwich.								
Canton	23° 10' 00" N.	Day 650	Government	600, 1,200, 1,600, 2,100	P G	0800 to 2200 ²	0.50	—	
	113° 20' 00" E.	Night 1,300							
Foochow	26° 07' 00" N.	Day 1,300	Government	600, 1,200, 1,600, 2,100	P G	0800 to 2200 ²	0.50	—	
	119° 18' 00" E.	Night 650							
Kalgan	40° 45' 00" N.	Day 1,300	Government	1,200, 1,600, 2,100, 3,000	O	N	—	—	
	115° 20' 00" E.	Night 650							
Kwangchow Wan	21° 03' 34" N.	Day 1,300	French Government	300, 600, 1,800	P G	0700 to 1100 1400 to 1700	0.25	2.00	
	110° 27' 45" E.	Night 500	Government	—	—	—	—	—	
Lanchowfu	Kansu	—							
Peking NPP	39° 55' 00" N.	1,500	U.S. Marine Corps	975, 1,908, 3,950, 4,525, c.w.	O	N	—	—	
	116° 47' 00" E.								
Peking XPK	39° 55' 00" N.	650	Government	1,200, 1,600, 2,100, 3,000	O	N	—	—	
	116° 47' 00" E.								
Shanghai	31° 29' 00" N.	100	U.S. Navy	300, 600 variable	O	X	—	—	
	121° 15' 00" E.								
Shanghai	31° 15' 00" N.	200	Government	600	P G	0800 to 2200	0.50 ^{1,2}	—	
	121° 20' 00" E.								
Shanghai	31° 15' 00" N.	Day 500	Soc. Francaise Radio-Electrique, Paris	600, 900, 1,800	P G ²	N	0.50	—	
	121° 32' 32" N.	Night 1,000							
Tientsin	39° 12' 32" N.	400	U.S. Army	600, 1,000, 600	O	N	—	—	
Tsungming ¹	—	300	—		—	—	—	—	
	Kiang-Su								
	121° 20' 00" E.								
Woosung	31° 30' 00" N.	Day 650	Government	600, 1,200, 1,600, 2,100	P G ¹	N	0.50	—	
	121° 21' 00" N.	Night 1,300							
	121° 25' 00" E.	Day 650							
Wuchang	Hupei	Day 1,300	Government	600, 1,200, 1,600, 2,100, 3,000	O	0800 to 2200 ²	—	—	
	30° 30' 00" N.	Night 1,300							
	114° 23' 00" E.								

COCOS-KEELING ISLANDS. (See under STRAITS SETTLEMENTS)

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
COLOMBIA (REPUBLIC OF)										
Barranquilla ¹	Meridian of Greenwich. 10° 56' 00" N. 74° 46' 00" W.	HJC	—	Government ..	2,200	—	—	—	—	¹ Under construction
Bogota ¹	04° 35' 00" N. 74° 12' 00" W.	—	—	Government ..	5,000	—	—	—	—	² Public correspondence is not admitted until further notice
Cali ¹ ..	03° 25' 00" N. 76° 45' 00" W.	HJE	—	Government ..	1,900	—	—	—	—	³ On 1,200 metre wave
Cartagena ..	10° 40' 00" N. 75° 30' 00" W.	CTG	Day 600 Night 1,200	Ges. für Drahtlose Tel.	600, 1,500, 2,000, 2,500, 3,000	P G ² ..	0600 to 2400	0.50	—	
Cucuta ¹ ..	07° 28' 00" N. 72° 42' 00" W.	HJF	—	Government ..	1,800	—	—	—	—	
Encanto (El) ..	73° 34' 00" W. 00° 56' 00" S.	OAU	220	Government ..	2,000	— ⁶	0630 to 1200	—	—	
Isle de San Andres ..	Caribbean Sea 12° 35' 10" N. ² 81° 41' 30" W.	—	—	Government ..	600, 1,200	P G	0900 ³ to 1400 ³ 1730 ³	—	—	
Medellin ¹ ..	06° 02' 00" N. 75° 50' 00" W.	HJD	—	Government ..	2,000	—	—	—	—	
Puerto Colombia ¹ ..	11° 02' 00" N. 75° 00' 00" W.	HJB	450	Government ..	600, 1,200	P G ..	N	0.50	—	
COSTA RICA										
Port Limon ..	—	X	—	United Fruit Co.	1,000	P G ..	—	0.60	—	
CUBA										
Baracoa ..	Meridian of Greenwich, Province of Santiago de Cuba 20° 25' 48" N. 74° 29' 19" W.	B	300	Government ..	300, 750	P G ..	—	—	—	¹ The working of the station is temporarily suspended ² Meteorological and

Chaparral	Province of	PWD	300	Government	300, 750	P G	—	—	hydrographic information is broadcasted from this station. (See International Time and Weather Signals) ^a For inland service
Fé (La)	Province of Santiago de Cuba 21° 12' 30" N. 76° 27' 40" W.	PWG	500	—	300, 3,800	P G	—	—	
Guantanamo	Province of Pinar del Rio 22° 02' 00" N. 82° 18' 00" W.	NAW	300 1,000	U.S. Navy	300, 600, 1,800 c.w.	P G ²	N.	0.30	
Habana (Havana)	Guantanamo Bay 19° 54' 38" N. 75° 08' 35" W.	M	—	Government	—	—	—	—	
Isla de Pinos	23° 09' 26" N. 82° 21' 22" W.	P	—	Government	—	—	—	—	
Manati	21° 52' 00" N. 82° 42' 00" W.	NMB	—	U.S. Navy	—	—	—	—	
Morro	—	PWA	1,000	Government	700, 2,800	P G	—	—	
Nueva Gerona	Havana 23° 09' 26" N. 82° 21' 29" W.	PWB	400	Government	300, 600	— ³	—	—	
Pinar del Rio	Isla de Pinos 22° 52' 30" N. 82° 42' 00" W.	PWF	300	Government	300, 750	— ³	—	—	
Santa Clara	Province of Pinar del Rio 83° 38' 20" W. 22° 25' 45" N.	PWC	300	Government	300, 750	P G	—	—	
Santiago	Province of Santa Clara ^a 22° 24' 00" N. 79° 50' 30" W. 26° 01' 00" N. 75° 50' 00" W.	SN	—	Government	—	P G	—	0.40	
CURACAO. (See under DUTCH WEST INDIES)	Meridian of Greenwich. 33° 08' 00" N. 33° 59' 00" E.	BXF	—	—	—	O	—	—	
CYPRUS									
Famagusta									
CYRENAICA. (See under TRIPOLI-TANA — ITALIAN LIBYA)									
CZECHOSLOVAKIA									
Prague	50° 05' 00" N. 14° 27' 00" E.	PRG	—	—	4,100 (c.w.) 4,000, 10,000	—	0920, 1545, 2030	—	

Blaavand Radio ¹	North East Coast	Day	Government	300, 450, 600, 800, 1,800	P G ⁷ ..	N	0.10	1.00	Royaume de Danemark, Copenhagen
Christiansø Is, Copenhagen Radio	55° 33' 20" N. 08° 03' 11" E.	200, Night 500.	—	—	—	—	—	1.00	² One hour in advance of Greenwich time
Drogden ⁴	55° 46' 49" N. 12° 36' 32" E.	200	Government	600, 650, 700 300, 600, 1,800	P G ..	N	0.10	1.00	³ The station is open weekdays, 0800 to 2100 (2130 from June 1st to August 31st). Sundays and holidays, 1100 to 1300 and 1700 to 2000.
Gilleleje-Flak ⁴	55° 33' 03" N. 12° 42' 57" E.	15	Government	300, 600	P R ⁵ ..	X	0.10	1.00	However, with the excep- tion of the first ten minutes of each of these hours it communicates with ships only if not occupied in communi- cating with Iveraa
Gjedser	Kattegat 56° 09' 48" N. 12° 18' 00" E.	30	Government	300, 600	P R ⁵ ..	X	0.10	1.00	⁴ Lightship
Gjedser Rev. ⁴	Falstar Island 54° 34' 25" N. 11° 55' 48" E.	135	State Railways of Denmark	300, 450, 600, 800, 1,000	O ⁶ ..	0600 to 2000	0.10	1.00	⁵ Radiotelegraphic communication with ships at sea only in emergencies. Public correspondence restricted to urgent messages relating to navi- gation
Gjedser Havn	Baltic Sea 54° 11' 00" E.	5	Government	300, 600	P R ⁵ ..	X	0.10	1.00	⁶ Official correspond- ence with the Danish ferry - boats of the Gjedser - Wamendunde line, concerning the rail- way traffic
Graaby ⁴	North Sea 55° 20' 02" N. 08° 04' 41" E.	25	—	250, 600	P R ⁵ ..	In general, N	0.10	1.00	⁷ The station sends out, when necessary, 1200 and 2200 (Danish time) report concerning the presence of ice in Danish territorial waters
Hammeren	North Sea 55° 19' 00" N. 14° 48' 00" E.	30	Government	300, 600	P R ⁵ ..	X	0.10	1.00	⁸ This station corre- sponds with fixed stations only
Horns, Rev. ⁴	North Sea 55° 34' 06" N. 07° 19' 30" E.	—	—	450, 600, 700 c.w., 300, 600	—	—	—	—	
Laeso-Rende ⁴	Kattegat 57° 12' 38" N. 10° 41' 38" E.	100	Government	300, 600	P R ⁵ ..	X	0.10	1.00	
Laeso Trindel ⁴	Kattegat 57° 26' 30" N. 11° 16' 45" E.	100	Government	300, 600	P R ⁵ ..	X	0.10	1.00	
Lynby Radio	Zealand 12° 28' 34" E. 55° 45' 57" N.	—	State Telegraphs	600, 3,500, 3,600, 4,200, 4,600 5,000, 5,600 300, 600	— ⁸	N	0.10	1.00	
Schults-Grund ⁴	Kattegat 56° 08' 54" N. 11° 11' 10" E.	100	Government	300, 600	—	X	1.10	1.00	
Skagens Rev. ⁴ (Svendborg)	Skagerrak 57° 46' 00" N. 10° 43' 20" E.	100	Government	300, 600	P R ⁵ ..	X	0.10	1.00	
Svendborg	—	—	—	300, 450, 500 600 300, 500, 600	—	—	0.10	1.00	
Thorshavn	The Faeroes 66° 46' 08" W. 62° 00' 52" N.	100	State Telegraphs	300, 500, 600	P G ¹ ..	— ³	0.10	1.00	
Tveraa	The Faeroes 66° 48' 00" W. 61° 33' 12" N.	—	—	300, 500, 600	— ⁸	X	0.10	1.00	
Vyl ⁴	North Sea 55° 23' 38" N. 07° 44' 13" E.	30	Government	300, 600	P R ⁵ ..	X	0.10	1.00	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Cost Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
DODECANESE , (See under ÆGEAN ISLANDS)										
DOMINICAN REPUBLIC										
Romana (La) ²	Meridian of Greenwich. 18° 25' 00" N. 68° 57' 00" W.	HIB	300, 600, 1,600	Guanica Centrale	300, 600, 1,600	P G ¹ ..	Local Time. 0800 to 1200 1400 to 1700	0.60 ²	0.30 ³	¹ La Romana and Santo Domingo also communicate with each other. Charge per word, fr. 0.40. This charge is reduced to fr. 0.20 for telegrams sent on the service of the San Domingo Government
Santo Domingo	18° 27' 42" N. 69° 53' 23" W.	HIA	300	U.S. Navy for San Domingo Government	300, 600, 750, 950, 1,600, 1,200, 1,400, 1,900, 2,400 600, 750, 950, 1,200, 1,400, 1,900, 2,400	P G ¹ ..	N	0.30	—	² For ordinary radio-telegrams
Santo Domingo	—	NJG	—	—	—	—	—	—	—	³ For radiotelegrams sent on the service of the San Domingo Government
DUTCH EAST INDIES										
Ambolna ..	Meridian of Greenwich. Amboina Island 03° 46' 40" S. 128° 06' 00" E.	PKE	420	Government	600, 1,200, 1,600, 2,300	P G ..	Java Mean Time. ¹ Week days and Holidays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.60	—	¹ Mean time of the Island of Java, 109° 48' 37.03" E. of Greenwich
Bandoeng Radio	—	PKK	—	Government	—	—	—	—	—	² Not yet opened
Batikapapan Radio	Borneo 0° 16' 10" S. 116° 50' 45" E.	PKF	150	De Bataafsche Petroleum Maatschappij	600, 1,800, 3,400	P G ..	—	0.60 ³	—	³ In the case of radio-telegrams transmitted through both the Balikpapan Radio and the Tarakan Radio stations, the coast charge of only one of these stations is collected
Chilachap Inlet	Java 07° 44' 28" S. 109° 00' 32" E.	PKM	150	—	—	—	—	—	—	⁴ The station sends out daily at 0100 (G.M.T.) on the wavelength of 8,800 metres (continuous wave)
Koepang Radio	Timor 10° 00' 30" S. 123° 36' 50" E.	PKD	420	Government	600, 1,600, 1,200, 2,300	P G ..	Weekdays and Holidays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.60	—	⁵ Communicates with fixed stations only

Station	Lat.	Long.	Height	Remarks	Time	Frequency	Power	Notes
Malabar Radio	Java, near Bandoeng	—	—	—	—	—	8,000 ⁴	—
Mandoel ¹	—	—	—	—	—	—	—	—
Manokwari Radio	New Guinea	PKK	400	—	—	—	1,400 c.w.	—
Neira Radio	134° 06' 26" E. 0° 53' 34" S.	PKJ	250	Government	..	—	1,400	—
Sabang	Banda Islands	PKA	400	Government	..	PG	600	0.60
Sitoebondo	04° 31' 53" S. 129° 53' 32" E. Weh Island Sumatra, 03° 54' 00" N. 95° 20' 06" E.	PKC	420	Government	..	PG	600, 1,600, 1,200, 2,300	0.60
Soerabaya	Java	PKH	—	Government Marine Dept.	..	O	—	—
Tarakan Radio	07° 11' 55" S. 112° 44' 21" E. Island of Tarakan	PKG	150	De Bataafsche Petr oleum Maatschappij	..	PG	600, 1,800, 3,375	0.60 ³
Wetlevreden	03° 18' 25" N. 117° 36' 15" E. Near Batavia	PKB	270	Government Marine Dept.	..	PG	600	0.60
DUTCH WEST INDIES	Meridian of Greenwich.							
CURACAO	12° 31' 05" N. 70° 02' 01" W.	PJA	108	Government	..	—	600	—
Bonaire	12° 09' 20" N. 68° 16' 15" W.	PJB	108	Government	..	—	600	—
Curaçao	12° 06' 20" N. 68° 56' 28" W.	PJC	400	Government	..	PG ²	300, 600, 1,800	0.60
S. Martin	63° 04' 19" W. 18° 01' 04" N.	PJD	650	—	..	PG	600, 900, 1,200, 1,800, 2,200	0.60

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
SURINAM—DUTCH GUIANA	Meridian of Greenwich.									
Albina ..	—	PJP	—	— ¹	300, 450, 600	P R ^{2,3}	—	—	—	¹ The word consisting of 10 characters
Moengo ..	—	PJO	80	—	300, 450, 600	P ⁴ ..	—	—	—	² The station is available for public correspondence with ships sailing to or from any port in the colony
Paramaribo Radio ..	55° 12' 13" W. 05° 49' 48" N.	PJN	300	—	600 , 900, 1,200, 1,800	P R ^{2,3} ..	0900 to 1000 1600 to 1700	0.60 ¹	6.00	³ The station is not yet open
ECUADOR	Meridian of Greenwich.									⁴ The station transmits only correspondence of the Surinaamische Bauscrite Maatschappij and of the Government of Paramaibo and Albina
Esmeraldas ..	00° 12' 00" N. 79° 42' 00" W.	HCE	500	—	300, 600 , 1,700 ¹ , 1,800	P G ³ ..	Local Time, 0600 to 1000 1300 to 1600 1800 to 2200 N	0.60	6.00	¹ Corresponds with fixed stations only
Guayaquil ..	79° 50' 00" W. 02° 12' 00" S.	HCG	600, 2,500, 3,200,	—	300, 600 , 800, 1,400, 2,500, 3,200, 3,500	P G ³ ..	N	0.60	6.00	² For inland communication
Quito ..	00° 13' 00" S. 78° 32' 00" W.	HCQ	900	Government	300, 600 , 800, 1,400, 2,500, 3,200, 3,500	— ¹	N	—	—	³ Principally inland communication
EGYPT	Meridian of Greenwich.									
Abu Zabal Radio ² ..	Near Cairo 30° 16' 09" N. 31° 22' 10" E.	SUC	2,500	British Post Office	10,000 c.w.	— ³	—	—	—	¹ Eastern European time two hours in advance of Greenwich time
Alexandria Radio ..	31° 16' 00" N. 30° 00' 00" E.	SUH	450, 200	Egyptian State Telegraphs	300, 600 , 800, 850, 1,000, 1,200, 1,800 300	P G ..	N	0.60	—	² British Government station of imperial wireless chain
Port Said ..	—	SUB	—	—	—	—	—	—	—	³ Corresponds with fixed stations only

ERITREA		Meridian of Greenwich.	ICX	—	—	—	—	Mean Time of Greenwich.	—	—	—	—	—
Abd-el-Kader Peninsula	Assab Radio ^a	12° 59' 40" N. 42° 44' 00" E.	ICX	160	Italian Government	300, 600	PG	0800 to 0500, 0800 to 1100 1600 to 1900	0.60	—	—	—	¹ Communicates with fixed stations only ² With an interruption of service for four hours between 0500 and 1200 ³ The accounts are settled by the Direction of Posts and Telegraphs, Asmara
Massawa Radio	ICX ^a	Red Sea 12° 36' 36" N. 39° 28' 59" E.	ICX	1,600	Italian Government	4,000	— ¹	—	—	—	—	—	—
Massawa Radio	IRG ^a	Red Sea 13° 36' 30" N. 39° 28' 59" E.	IRG	270	Italian Government	300, 600, 1,200	PG	N ²	0.60	—	—	—	—
ESTHONIA													
Hapsalu	..	28° 13' 00" E.	EPU	—	—	8,100 900	O	N	0.30	—	—	—	¹ The station is open generally for the requirements of navigation. It accepts for transmission to the Tallinn coast station public correspondence from ships at sea which are unable to communicate with Tallinn direct
Nekmangrund Lightship	..	59° 23' 00" N. 22° 13' 00" E.	—	500	—	200, 600, 1,500	PR ¹	1000 to 1100 1600 to 1700 1000 to 1100	0.30	—	—	—	² Relief lightship
Reserve Lightship ^a	..	59° 05' 00" N.	—	50	—	300, 450, 600	PR ¹	1000 to 1100 1600 to 1700 1000 to 1100	0.30	—	—	—	³ Responds with fixed stations only
Revalstein Lightship	..	24° 44' 00" E. 59° 44' 00" N.	—	50	—	300, 450, 600	PR ¹	1000 to 1100 1600 to 1700 1000 to 1100	0.30	—	—	—	—
Saritchev Lightship	..	58° 16' 00" N. 24° 47' 00" E.	—	30	—	200, 600, 1,500	PR ¹	1000 to 1100 1600 to 1700 1000 to 1100	0.30	—	—	—	—
Tallinn	..	59° 26' 00" N. 26° 43' 00" E.	—	250, 90	—	600, 1,200, 1,900 1,000	PG	N	0.30	—	—	—	—
Tartu..	..	58° 22' 00" N.	EWT	200	—	— ³	— ³	N	—	—	—	—	—
FALKLAND ISLANDS		Meridian of Greenwich.											
Falkland Islands	..	51° 30' 00" S. 57° 49' 00" W. ^a	BZN	650	British Admiralty	300, 600, ⁴ 4,500 600	PG	Local Time. ¹ N ²	0.60	—	—	—	¹ Local time 3 hours 55 minutes later than Greenwich time ² Approximately ³ Communicates with fixed stations only ⁴ Other wavelengths are fitted for official use only
Fox Bay	..	51° 59' 00" S. 60° 02' 00" W.	VQZ	80, 100	Government	— ³	— ³	—	—	—	—	—	⁵ The station communicates with Montevideo on three nights a week only, viz., Mon.-Tues., Wed., Thurs., Fri.-Sats. A continuous watch is kept for calls from ships
Port Stanley	..	53° 41' 15" S. 57° 49' 15" W.	VPC	—	Government	300, 600	—	—	—	—	—	—	—
FAROE ISLANDS (THE FAEROES) (See under DENMARK)													
FUTJI ISLANDS		Meridian of Greenwich.											
Lambasa	..	16° 25' 00" S. 179° 24' 00" E.	VPE	300	Government	300, 600	PG ²	Fiji Islands Time. ¹ — ³	0.60	—	—	—	¹ Twelve hours in advance of Greenwich time

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal) / Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
FIJI ISLANDS—contd.										
Savu, Savu ..	Meridian of Greenwich, Vanua Levu, 16° 46' 30" S. 173° 21' 30" E.	VQL	120	Government ..	600	— ⁴	—	—	—	² The station exchanges meteorological telegrams with ships in stormy weather
Suva ..	Viti Levu 18° 08' 55" S. 178° 27' 30" E.	VPD	300	Government ..	300, 600	P G ² ..	— ³	0.60	—	³ From Monday to Friday 0900 to 1300, 1400 to 1500 or until completion of work, and at 1900 until completion of work; Saturdays 0900 to 1300 or until the completion of the work; Sundays and public holidays 0800 to 0830, and at 1900 until completion of work
Tavuni ..	16° 46' 30" S. 179° 59' 15" W.	VPF	200	Government ..	300, 600	P G ² ..	— ³	0.60	—	⁴ Communicates with fixed stations only
FINLAND (SUOMEN TASAVALLA)										
Abo ..	Meridian of Greenwich. 22° 14' 15" E. 66° 25' 38" N.	OJE	200	Government ..	1,200	P G ..	—	0.30	¹² F.Mk.	¹ The accounts are settled by the Telegraph Administration of Finland, Helsingfors
Hango ..	22° 56' 40" E. 59° 50' 18" N.	OJD	200	Government ..	300, 600	P G ..	N	0.30	¹² F.Mk.	² Time of Helsingfors, 1 hour 40 minutes in advance of Greenwich time
Helsingfors ¹ ..	25° 03' 07" E. 66° 08' 24" N.	OJA	500	Government ..	1,500, 1,600, 2,000, ³ 6,000	O ³ ..	N ⁶	—	—	³ Information regarding weather is distributed from the station at 1010 and 1030 on a wavelength of 2,000 metres
Kotka ..	26° 57' 04" E. 66° 27' 16" N.	OJC	200	Government ..	600, 1,200	P R ..	X	0.30	¹² F.Mk.	⁴ Other wavelengths are fitted for official use only
Mariehamn ..	19° 55' 00" E. 60° 05' 00" N.	OJF	200	Government ..	300, 600	P R ..	X	0.30	¹² F.Mk.	⁵ Receives weather reports four times in 24 hours
Riihimäki ² ..	23° 13' 17" E. 60° 44' 08" N.	—	—	Government ..	—	O ..	N	—	—	⁶ Gives the Helsingfors time at 1700. Gives newspaper information at 0900 and
Vaasa ..	63° 05' 10" N. 28° 45' 00" E.	OJG	200	Government ..	1,200	P G ..	N	0.30	¹² F.Mk.	
Viborg ¹ ..	60° 42' 55" N.	OJB	200	Government ..	300, 600	P G ..	N	0.30	¹² F.Mk.	

2100. During the winter on the Finnish ice conditions sent out at about 1700. Exchanges private communications with Riga and Bu, barest.

¹ Coast station charge 40 centimes per word.

The coast charge is reduced to fr. 0.15 per word for ships whose regular service is between France on the one hand, and Corsica, Algeria and Tunis on the other.

² Connected to Mengam (FUE) which will provisionally employ a wavelength of 2,400 m.(c.w.) for reply to requests for

bearings and transmitting results. Bearings on a wavelength of 2,100 m. (c.w.) are obtained by first calling Mengam on 2,400 m. (c.w.)

³ The coast charge is reduced to fr. 0.15 per word for correspondence with ships whose home ports are on the coast of the English Channel and the Straits of Dover, and are engaged in a regular service between France and England.

⁴ Connected with Men-
gam Radio Station, and
serves normally as send-
ing station

⁶ Transmissions are on 900, 1,400 and, occasionally, 2,610 metres. Telephony on 900 is transmitted from the station to aeroplanes leaving Le Bourget. Messages are also sent to Dijon on 1,400 metres between 11 a.m. and 12 noon.⁶ Works in connection with Ouessant, I.S.F. (FFU).

FRANCE AND
ALGERIA

Alajaccio-Aspretto	..	41° 55' 34" N.	10° 30' 00" W.
Algiers T.S.F.	..	36° 55' 36" E. To the East of Algiers	3° 10' 00" E.
Antibes	..	03° 11' 00" E.	36° 45' 00" N.
Aubagne	..	43° 33' 00" E.	7° 08' 00" E.
Basse-Lande *	..	05° 36' 00" E.	43° 16' 30" N.
	..	43° 16' 30" N.	Near Nantes
Bayonne	..	43° 35' 00" N.	1° 30' 00" W.
Berre	..	43° 28' 54" N.	05° 10' 48" E.
Bernières	..	09° 20' 00" N.	49° 20' 00" N.
Berre, Bouche-du-	..	00° 25' 00" E.	05° 10' 48" E.
Rhône	..	43° 28' 52" N.	37° 14' 43" N.
Bizerte	..	37° 14' 43" N.	9° 40' 03" N.
Bonifacio T.S.F.	..	Algeria	Strait of Bonifacio
Bordeaux T.S.F.	..	41° 23' 15" N.	09° 12' 00" E.
	..	09° 12' 00" E.	Near Bordeaux
	..	44° 52' 21" N.	00° 37' 12" W.
Bordeaux	..	44° 52' 21" N.	Croix d'Hins
	..	44° 42' 00" N.	44° 42' 00" N.
Boulogne-sur-Mer	..	50° 43' 00" W.	08° 38' 00" W.
T.S.F.	..	50° 43' 00" W.	01° 37' 00" E.
Bourget (Le)	..	Near Paris	48° 57' 00" N.
	..	48° 57' 00" N.	02° 53' 00" E.
Bouscat (Bordeaux)	..	44° 32' 27" N.	00° 37' 12" W.
Brest	..	48° 19' 58" N.	04° 33' 20" W.
Brest, La Trinité *	..	48° 21' 53" N.	4° 21' 53" N.
	..	4° 21' 53" N.	04° 35' 58" W.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.	Remarks.
								Per Word.	Mini- mum Charge.
FRANCE AND ALGERIA—contd.									
Brest, La Trinité ¹⁸	Meridian of Greenwich. 48° 21' 53" N. 04° 35' 18" W.	FEX	—	—	450, 2,100 (c.w.)	D F ..	—	—	⁷ Special correspondence in connection with the marine business of the ships employed on the service between Dieppe and Newhaven and Dieppe trawlers
Brest, Moulin du Seigneur ¹⁸	48° 10' 36" N. 04° 35' 18" W.	FEM	—	—	450 ¹³ , 800	D F ..	—	—	
Brest, Moulin du Seigneur ⁶	48° 19' 36" N. 04° 33' 14" W.	FEI	300	—	450, 600, 800	D F ..	—	—	
Cherbourg ⁶	49° 36' 32" N. 01° 36' 00" W.	FUC ¹⁷	200	State Telegraphs	450 ¹³ , 600, 800	& Aviation D F ¹⁷ ..	N	—	
Cherbourg, Rouges-Torres	49° 39' 00" N. 01° 38' 00" W.	FFC	300, 400	Navy	c.w.	P G ..	N	0.40 ³	⁸ Basse Lande is a high power station, which has inaugurated a broadcast private message programme to ships at sea which are out of the range of the ordinary coast stations in France
Cuers—Pierrefeu	06° 05' 50" E. 43° 14' 40" N.	FUO	150	— ¹⁸	450, 600	O ..	X	—	⁹ Direction finding wave length
Dieppe	49° 55' 30" N. 01° 04' 30" W.	FFI	150	State Railway Administration	400	P R ⁷ ..	0900 to 1700 2100 to 0500	0.40	The station performs a local service with La Rochelle trawlers
Dijon	47° 31' 00" N. 5° 30' 00" E.	FND	—	—	—	—	—	—	¹⁰ Transmitting station, Ouessant (FFU)
Dunkerque-Castelnau (Dunkirk)	51° 02' 00" N. 02° 22' 00" E.	FFD	800	Navy	600 c.w.	P R ..	0200 to 0400 0800 to 1000 1600 to 1800 2000 to 2200	0.40 ³	¹¹ Works in connection with Marseilles T.S.F.
Eiffel Tower	Paris 48° 51' 00" N. 02° 18' 00" E.	FL	—	—	2,200, 2,600, 6,500	—	—	—	¹² In exceptional cases a wavelength of 600 can be used
Gris Nez	50° 52' 58" N. 01° 35' 18" E.	FEN	120	Navy	450 ¹³ , 600, 800	D F ¹⁶ ..	N	—	¹³ Information relating to barometric pressure direction and force of the wind, state of the sky and sea, is transmitted on request. A charge is made
Guipavas Radio	48° 47' 00" N. 04° 26' 00" E.	PEG	—	Navy	450, 600, 800	D F ¹⁶ ..	N	—	¹⁴ The station is in a position to communicate to ships, on request meteorological information concerning the barometric pressure, the wind,
Havre, T.S.F. (Le)	49° 31' 30" N. 00° 07' 00" E.	FEH	250	Postal, Telegraph and Telephone Administration	300, 600	P G ..	N	0.40 ³	
Hourtin	01° 07' 10" W. 45° 13' 08" N.	FUO	—	Navy	—	O ..	X	—	
Jijelli (Djiddjelli)	Algeria. 36° 49' 10" N. 05° 46' 12" E.	FEJ	200	State Telegraphs	450 ¹³ , 600, 800	D F ¹⁶ ..	N	—	
Lorient	47° 44' 05" N. 03° 20' 45" W.	FUN	300	—	450 ¹³ , 600, 800	D F ..	—	—	
Lorient-Gonio ¹⁹	47° 44' 00" N. 03° 21' 00" W.	FFL ¹⁹	300	Navy	450, 600	D F ⁶ ..	N	—	

Lorient-Pen-Mané ..	42° 44' 00" N. 03° 21' 00" W.	FFL	300, 400	Navy	..	300, 600	P G ²⁴	N	0.40	the state of sky and sea, etc. The charge for this information is calculated as follows: (a) Telegraph charge 15 centimes per word; (b) Coast station charge, 40 centimes per word.
Lions ..	45° 41' 00" N. 04° 47' 00" E.	YN	—	—	—	1,500, 8,100, 13,200, 15,500 c.w.	—	—	—	
Lions ..	43° 25' 00" N. 05° 13' 00" E.	FNM	—	—	—	1,680	Aviation	0700 to 1830	—	
Matignane ..	43° 25' 00" N. 05° 13' 00" E.	FNM	—	—	—	1,680	Aviation	0630 to 1900	—	
Marseille ..	43° 17' 58" N. 05° 21' 31" E.	FEL ¹²	200	Navy	..	450, 13,600, 800	DF ⁶ .. & Aviation DF ¹⁴ ..	N	—	¹⁵ A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of radio compass work
Marseille ..	43° 17' 58" N. 05° 21' 31" E.	FFM	—	—	—	450, 600	—	—	—	
Marseille T.S.F. ..	43° 17' 58" N. 05° 21' 31" E.	FFM	250	Postal, Telephone and Administration	..	300, 600	P G ¹⁶ ..	N	0.40 ¹	¹⁶ Connected with traffic station
Mengan ..	Near Brest 48° 20' 52" N. 04° 35' 20" W.	FUE	800	Navy	..	600, 800, 2,100 2,250, 2,400	P R ²¹ ..	0300 to 0330 0900 to 0930 1500 to 1530 1825 to 1930 2000 to 2030	0.60	¹⁸ Station closed temporarily ¹⁹ Works in conjunction with Lorient-Pen-Mané ²⁰ Open for service during the daytime only
Mitre-Genio (La) ²⁵	Near Toulon 43° 06' 11.4" N. 05° 55' 37" E.	FEM ²⁷	—	Navy	..	450 600, 800	DF ¹⁸ ..	Monday, Tuesday, Friday, 0700 to 1100 1300 to 1800 Wednesday, Thursday, Saturday, 0700 to 1000 1100 to 1805 Sundays closed	—	²¹ Correspondence restricted to radio telegrams exchanged with ships of the U.S.A. Shipping Board which are fitted with continuous wave apparatus
Montelinar ..	44° 32' 00" N. 04° 48' 00" E.	FNQ	—	—	—	1,680	Aviation	—	—	²² Chambre de Commerce de Rouen ²³ Société Independante de T.S.F.
Moulin du Seigneur-Genio ²	Near Brest 48° 19' 36" N. 04° 33' 14" W.	PEI ¹²	—	Navy	..	450, 600, 800	DF ¹⁸ ..	N	—	²⁴ The station is open to general public correspondence
Nancy ..	48° 38' 00" N. 06° 09' 00" E.	FNC	—	—	—	1,400, 1,450	Aviation	0615 to 1830	—	²⁵ Bearings are transmitted by Toulon-Mourmelon (FUI) on 600 metre wavelength
Nantes (Basse Lande)	—	FRX	—	Navy	..	2,700	—	X	—	²⁶ This station corresponds with fixed stations only
Nantes (Basse Lande)	47° 10' 40" N. To the West of Nice	UA	1,500 3,000	—	..	2,650, 9,000, 13,800 c.w.	— ²⁸	—	—	²⁷ Under construction
Nice T.S.F. ..	43° 39' 00" N. 07° 10' 00" E.	PFN	250	Postal, Telegraph and Telephone Administration	..	300, 600	—	N	—	
Nîmes ..	43° 52' 00" N. 04° 15' 00" E.	FNN	—	—	—	1,680	Aviation	0630 to 1345	—	
Oran-Ain-el-Turck	To the West of Oran	FUK	600	Navy	..	300, 450, 600 800, 1,350	P G ..	N	0.40 ¹	
Onessant (Pen-ar-Roch)	35° 45' 00" N. 00° 45' 30" W. 48° 28' 00" N. 05° 04' 00" W.	FEO	—	Navy	..	—	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Fr. n. s.		Remarks.
								Per Word.	Minimum Charge.	
FRANCE AND ALGERIA—contd.										
Ouessant (Pen-ar-Roch) ¹¹	Meridian of Greenwich. Pan-ar-Roch 48° 26' 30" N. 03° 05' 40" W.	FEO (FFV)	200	—	450, ¹³ 600, 800	D F ..	—	—	—	
Ushant-Gonio *	48° 28' 00" N. 03° 04' 00" W.	FFF	—	Navy ..	300, 450, 600	D F ¹⁶ ..	N	0.40	—	
Ushant T.S.F.	Ushant Island 48° 27' 05" N. 03° 05' 00" W.	FFU	450	Postal, Telegraph and Telephone Administration	300, 600, 750	P G ..	N	0.40	—	
Penmarch ..	48° 48' 30" N. 04° 21' 01" W.	FEP	120	Navy ..	450, ¹³ 600, 800	D F and Aviation	N	—	—	
Perpignan ..	43° 43' 00" N. 03° 53' 00" E.	FNP	—	—	1,300	D F ¹⁶ & Aviation	0630 to 1825	—	—	
Pointe du Raz ..	48° 02' 23" N. 04° 43' 34" W.	FER	120	State Telegraphs	450, ¹³ 600, 800	D F ¹⁶ & Aviation	N	—	—	
Porquerolles ..	Hyeres Islands 42° 59' 00" N. 06° 12' 00" E.	FUQ	600	Navy ..	450, 600 800	O ..	N	—	—	
Revel ..	—	ELN	—	—	1,200, 1,500, 1,900	—	—	—	—	
Rochefort ..	Soubisé 43° 46' 00" N. 01° 00' 00" W.	FES	150	—	450, ¹³ 800	D F ..	—	—	—	
Rochefort-Sur-Mer ..	43° 57' 00" N. 00° 31' 12" W.	FFR	400	Navy ..	300	P R ¹⁰ ..	N	0.40	—	
Romilly sur Seine ..	48° 31' 00" N. 03° 44' 00" E.	FNR	—	—	1,400	Aviation	0500 to 1800 and later if necessary	—	—	
Rouen Port ²¹ ..	—	HYA	50	— ²³	Transmitting 720 Listening 600 1,500	P 17 ..	N	—	—	
Sainte Assise ..	25 miles from Paris	UFT	—	—	900, 1,400, 1,680	—	—	—	—	
St. Inglevert ..	Near Calais 50° 33' 00" N. 01° 44' 00" E.	FNG	—	—	1,400, 1,720, 2,500 450	Aviation	0415 to 2000	—	—	
Strasbourg ..	48° 33' 00" N. 07° 47' 00" E.	FNS	—	—	—	—	0600 to 1830	—	—	
Stax ..	Tunisia 34° 45' 06" N. 10° 46' 24" E.	FUS	—	—	—	D F ..	—	—	—	

Soubise-Gonio	45° 56' 21" N. 00° 50' 13" W.	150	Navy	..	..	450, 600, 800	DF ¹⁶ & PG	..	—	—	—	—
S. Marie de la Mer T.S.F.	Gulf of Lions 43° 27' 00" N. 04° 26' 00" E.	450	Postal, Telegraph and Administration	..	..	300, 600	..	..	0.40 ¹	—	—	—
S. Nazaire ¹⁹	Ville-ès-Martin 47° 15' 21" N. 02° 13' 49" W.	120	Navy	..	..	450, ² 800, ³ 800 ⁹	DF ¹⁶ & Aviation	N ²⁰	—	—	—	—
Toulon	La Mire 43° 06' 11" N. 05° 55' 37" E.	300	—	—	..	600, 800	DF and Aviation	—	—	—	—	—
Toulon-Mourillon	43° 07' 00" N. 05° 55' 00" E.	800 1,200	Navy	..	..	450, 1,350	O	X	—	—	—	—
Toulon Liberte	43° 06' 11" N. 05° 55' 37" E.	—	—	—	..	450	DF	—	—	—	—	—
Toulouse	43° 35' 00" N. 01° 29' 00" E.	—	—	—	..	1,200, 1,400	Aviation	0500 to 2000 and later if necessary	—	—	—	—
Treguier	St. Gonyer 48° 56' 13" N. 03° 13' 56" W.	120	State Telegraphs	..	..	450, ¹³ 600, 800	DF ¹⁶ & Aviation	N	—	—	—	—
St. Raphaël	06° 44' 07" E. 43° 25' 15" N.	150	—	—	..	—	O	X	—	—	—	—
Trinité-Gonio (La) ²¹	Near Brest 04° 35' 18" W. 48° 11' 13" N.	—	Navy	..	..	450, 2,100	DF ¹⁶	N	—	—	—	—
Valenciennes	50° 21' 00" N. 13° 33' 00" E.	—	—	—	..	1,200, 1,400	Aviation	0500 to 2000 and later if necessary	—	—	—	—
FRENCH EQUATORIAL AFRICA (FRENCH CONGO)												
Duala	04° 02' 41" N. 09° 40' 50" W.	—	Government	..	..	600, 1,650, 2,500	—	—	—	—	—	—
Loango	Congo, Pointe Noire 04° 46' 49" S. 11° 43' 02" E.	Day 275 Night 550	Government	..	..	300, 600, 1,800	PG ³	0800 to 1030 ² 1400 to 1630 ²	0.30	3.00	—	—
FRENCH GUIANA												
Cayenne	Meridian of Greenwich. 04° 56' 36" N. 52° 19' 30" W.	300	Government	..	..	600, 800, 1,000	PG ²	0800 to 1000 ¹ 1400 to 1000 ¹	0.40	—	—	—
FRENCH INDOS-CHINA												
Cape St. James	10° 30' 00" N. 107° 05' 14" E.	—	Government	..	..	300, 600	—	—	—	—	—	—
Cac-Ba ⁶	20° 41' 06" N. 107° 02' 05" E.	80	Government	..	..	300, 600 ¹	DF	0700 to 1100 ¹ 1400 to 1700 ¹	0.50	5.00	—	—
Fort Bayard	21° 13' 00" N. 110° 23' 00" E.	250	Government	..	..	1,800, 2,400	PG	0700 to 1100 1400 to 1700	0.50 0.50	5.00 5.00	—	—

¹ One hour in advance of Greenwich time
² Continuous service during the voyages of the regular steamers
³ The station also communicates with Brayza-ville

¹ The station is open from 0700 to 2000 and during the crossing of the regular packets
² The station also corresponds with Martinique

¹ Direction finding wavelength
² Meteorological telegrams are transmitted at 0930

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
FRENCH INDOS-CHINA—contd.										
Hanoi	Meridian of Greenwich. 21° 03' 49" N. 105° 54' 18" E.	FAO	1,000	Government	300, 600, 1,800, 2,400, 3,000	PG ² ..	0700 to 1100 1400 to 1700	—	—	³ Seventh time belt east of the Greenwich belt.
Kien-An ⁶	Near Hap-hong 20° 47' 06" N. 106° 37' 06" E.	PKA	150	Government	300, 600, 1,800	PG ³ , DF	0700 to 1100 1400 to 1700	0.50	5.00	⁴ Meteorological telegrams are transmitted at 1100 and 2100
Moncay	21° 31' 06" N. 107° 58' 06" E.	FMI	150	Government	600, 1,800	PG ..	0700 to 1100 1400 to 1700	0.50	5.00	⁵ The station transmits time signals at 0915, 0917, 0919. It is equipped for D.F. and works in conjunction with Cac-Ba
My-Tho	10° 21' 42" N. 106° 21' 42" E.	FCA	250	Government	600, 2,000	PG ⁴ ..	0700 to 1100 1400 to 1700	0.50	5.00	⁶ Kien-An and Cac-Ba work in conjunction with each other.
Phu-Quoc	10° 18' 06" N. 103° 58' 06" E.	FPK	200	Government	600, 2,000	PG ..	0700 to 1100 1400 to 1700	0.50	5.00	
Phu-to	10° 18' 06" N. 103° 58' 06" E.	—	—	Compagnie Générale de Télégraphie Sans Fil	—	—	—	—	—	
Poulo-Condore	Near Saigon 08° 40' 06" N. 106° 41' 06" E.	FPR	100	Government	600, 2,000	PG ..	0700 to 1100 1400 to 1700	0.50	5.00	
Tourane	Tourane Bay, Observatory Inlet 16° 06' 55" N. 108° 12' 41" E.	FLT	250	Government	300, 600, 1,800	PG ..	0700 to 1100 1400 to 1700	0.50	5.00	
FRENCH SETTLEMENTS IN OCEANIA										
Makatea	Meridian of Greenwich. 148° 11' 00" W. 15° 50' 00" S.	FFY	Day 400 Night 600	Government	300, 600	PG ¹ ..	Zero Time Zone 0800 to 0900 1600 to 1700 2100 to 2200	0.60	—	¹ The station also communicates with Papeete, Ile Tahiti
Papeete, Ile Tahiti	149° 29' 15" W. 17° 35' 15" S.	FOP	Day 600 ² Night 1,000 ³ 1,500 ⁴ 2,000 ⁵	Government	600, 2,000 ⁴ 2,500 ⁴	PG ^{5,7} ..	Local Time ⁶ 0000 to 0200 0400 to 0500 ⁶ 1930 to 2400 ⁶ Sundays : 0000 to 0200 ⁶ Holidays : 0400 to 0500 ⁶ 0800 to 0900 1930 to 2400	0.60	—	² With 600 metre wave ³ With 2,000 metres wave ⁴ The wavelengths of 2,000 and 2,500 m. are used for correspondence with Apia Radio every day from 1930 until completion of traffic ⁵ Meteorological reports and navigation notices are transmitted twice daily on 600 metres at 1100 and 2300 (see International Time and Weather Signals)

FRENCH SOMALI COAST	Iibuti (Djibuti)	..	Meridian of Greenwich.	FJJ	350	Government	..	600	PG ² ..	Mean time of Aden ¹ 0700 to 1100, 1400 to 1800, 2000 to 2400	0.60	—	⁶ The hours are extended during the passage of the regular steamers or in the case of necessity. ⁷ The station communicates with Tutuila, using 600 m. wave. ⁸ Meridian 150° west of Greenwich. ⁹ The station also listens from 0900 to 0915, 1000 to 1015, 1100 to 1115, 1500 to 1515, 1600 to 1615, 1700 to 1715.
FRENCH WEST AFRICA AND THE SAHARA	Konakri	..	Guinea N. 09° 30' 59" N. 13° 42' 46" W.	FCO	400	Government	..	300, 600, 2,000	PG ² ..	0800 to 1000 1200 to 1400	0.45	—	¹ The Rufisque station communicates with the interior. It only communicates with ships in the case of the interruption of the Dakar station. It then uses the 600 m. wavelength.
	Dakar	..	Senegal N. 14° 40' 27" N. 17° 25' 22" W.	FDA	600	Government	..	300, 600	PG ¹ ..	N	0.45	—	² The station also communicates with Aden, Berbera and Assab.
	Grand Bassam	..	Ivory Coast N. 03° 43' 00" W. 05° 11' 00" N.	FBA	300	Government	..	600	PG ..	0600 to 1100 1400 to 1700	0.30	—	³ The station also communicates with Bamako, Monrovia (Liberia) and Rufisque.
	Lome	..	Togo N. 06° 16' 08" N. 09° 17' 05" E.	KBL	—	Government	..	300, 600, 1,400, 1,800, 2,500	—	—	—	—	⁴ The accounts are settled by the Office Radiotelegraphique l'Afrique Occidentale Française.
	Port Etienne ⁴	..	Mauritania, Bay of Lévrier N. 20° 55' 39" N. 17° 03' 01" W.	FPE	400	Government	..	300, 600, 2,000	PG ⁵ ..	0800 to 1000 1200 to 1400 1600 to 1800	0.45	—	⁵ The station also communicates with Bamako, Conakry and Port Etienne.
FRIENDLY ISLANDS (See under PACIFIC ISLANDS)	Rufisque	..	Senegal N. 14° 43' 04" N. 17° 16' 23" W.	FRU	500	Government	..	300, 600, 2,000	PG ¹³ ..	Sunrise to sunset	0.45	—	⁶ The station also communicates with Atar, Chinguetti and Rufisque.
	Tabu ..	..	Ivory Coast N. 04° 25' 19" N. 07° 22' 27" W.	FTA	400	Government	..	300, 600, 1,700	—	Sunrise to sunset	0.45	—	
	Bathurst	..	13° 27' 16" N. 16° 34' 19" W.	BZK	—	—	—	2,000, 2,400, 4,000, 4,800, 5,000	—	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
GAMBIA—contd.										
George Town ..	Meridian of Greenwich. McCarthy Island 14° 16' 00" W. 13° 31' 00" N.	—	—	—	—	—	—	—	—	
GEORGIA										
Tiflis ..	Georgia 44° 48' 16" E. 41° 41' 59" N.	RDK	1,000	—	2,500	— ¹	N	—	—	¹ Unofficial call sign
Tiflis ..	—	TIF ¹	—	Georgian Government	—	—	—	—	—	
GERMANY										
Adlergrund Lightship ⁵	Meridian of Greenwich. Baltic Sea 14° 22' 12" E. 54° 49' 59" N.	KAG	100	Reichspostministerium, Berlin, W.66	300, 450, 600	PR ^{1,2}	0800 to 0815 1100 to 1115 1400 to 1415 1700 to 1715 1900 to 1915	0.37 ²	3.75 ²	¹ Public correspondence restricted to urgent messages relating to navigation ² For telegrams of which the only wireless transmission takes place between the lightship and the shore a fixed charge of fr. 1 per telegram only is collected, in addition to the ordinary charges for transmission over the land lines
Amrum Bank Lightship	North Sea 54° 33' 12" N. 07° 53' 12" E.	KAF	210	Government ..	300 , 600	PR ^{1,2}	N	0.37 ²	3.75 ²	³ The station undertakes only the exchange of correspondence between the "Norddeutscher Lloyd" and their ships and the transmission of semaphore telegrams, originating at, or destined for Weser Feuerschiff
Aussen Jade Lightship	North Sea 07° 56' 40" E. 53° 51' 30" N.	KAU	60	Government ..	300, 450	PR ^{1,2}	—	0.37 ²	3.75 ²	⁴ Control station
Berlin ..	—	DK LP	—	—	2,000 3,200, 3,700, 8,100	—	—	—	—	
Borkum ..	—	KBM	—	Government ..	300, 600, 1,250	PR ..	N	0.37 ²	3.75	
Borkum Light	North Sea 06° 40' 12" E. 53° 35' 48" N.	—	—	—	—	—	—	—	—	
Borkum ..	53° 34' 51" N. 06° 41' 42" E.	KBO	300	Government ..	600, 800	DF ^{2,10} & Aviation DF ² ..	N	—	—	
Borkum ..	53° 35' 06" N. 06° 40' 06" E. ⁴	—	—	—	—	—	—	—	—	
Borkum Reef Lightship	North Sea 53° 45' 30" N. 06° 03' 30" E.	KBR	60	Government ..	300 , 600	PR ^{1,2} ..	X	0.37.5 ²	3.75 ²	

Bremerhaven Lloyd- halle	North Sea Coast 08° 33' 08" E. 53° 33' 04" N. Kiel Bay 10° 12' 08" E. 54° 27' 26" N. North Sea Coast 53° 52' 27" N. 08° 53' 42" E.	KBH	80	Norddeutscher Lloyd	300	PR ³ ..	N	0.37.5	3.75	⁶ For regulations re- lating to W/T D.F. sta- tions see under Germany in D.F. section ⁶ Approximately ⁷ Available for public service ⁸ Temporarily sus- pended; replaced by reserve lights. Official correspondence with Tralleborg Radio and with the ferry boats of the Sassnitz-Tralleborg Radio line. Public correspond- ence is also exchanged with the latter
Bulk, F. S. ..		KBK	—	Government ..	600, 820	PR ..	N.	0.37.5	3.75	
Cuxhaven ..		KCX	Day 325 Night 650	Government ..	300, 800	PG ..	N	0.37.5	3.75	
Deutsch Altenburg	—	OHD	—	—	3,100, 3,500, 4,000, 4,250, 5,000, 5,670, 8,500 1,200	—	—	—	—	
Düsseldorf Eider Lightship	—	DF KAJ	30	Government ..	300, 600	PR ^{1,2}	N	0.37.5 ²	3.75 ³	¹⁰ A ship requiring bear- ings should call the station Wilhelmshaven III Ein- fabrt, F.S. (call signal KAN) on a damped wave of 600 metres. That station makes the neces- sary arrangements, in conjunction with three direction finding stations which are concerned, and communicates the position ascertained in longitude and latitude to the ship concerned. These stations are only available for public service when not in use by the navy. No charge is at present made for the service, which is in the nature of an experiment
Eiderlotsengaliote Lightship	North Sea 54° 16' 06" N. 08° 18' 18" E.	KBL	100	Government ..	300, 600	PR ^{1,2}	N	0.37.5 ²	3.75 ²	
Elbe Lightship	North Sea 54° 13' 48" N. 08° 35' 39" E.	KBF	60	Government ..	300	PR ^{1,2}	X	0.37.5 ²	3.75 ²	
Fehmarnbelt Lightship	North Sea 54° 00' 30" N. 08° 15' 00" E. Baltic Sea 54° 35' 45" N. 11° 09' 00" E.	KBC	Day 105 Night 210	Government ..	300, 450, 600	PR ^{1,2}	N	0.37.5 ²	3.75 ²	
Frankfurt-on-Main ..	—	FM	—	—	1,200, 1,850	—	0730, 1335, 1840	—	—	
Hamburg ..	—	SW	—	—	—	—	—	—	—	
Hanover ..	—	OUI	—	—	—	—	—	—	—	
Heligoland ..	North Sea 54° 11' 00" N. 07° 53' 00" E.	KAH	100	Ministry of Posts and Telegraphs	9,700 300	PG ..	0700 (0800) to 2100 Sundays and holidays : 0800 to 1300	0.37.5	3.75	
Königs Wusterhausen	52° 18' 00" N. 13° 40' 00" E.	LP	—	—	5,250	—	—	—	—	
Lindenberg ..	55° 00' 00" N. 08° 23' 00" E. ⁶	LI	—	—	—	D ^{1,6} ..	—	—	—	
List F.R.A. ..	55° 00' 12" N. 08° 23' 12" E.	KAO	300	Government ..	600, 800	DF ^{6,4} & Aviation PR	N.	—	—	
List F.S. ..	55° 00' 00" N. 08° 23' 00" E.	KAL	—	Government ..	600	—	N	0.37.5	3.75	
Lübeck ..	55° 00' 00" N. 08° 23' 00" E.	HMB	—	—	800	—	—	—	—	
Nauen ..	Baltic Coast 52° 39' 00" N. 12° 55' 00" E.	POZ	—	—	3,900, 4,000, 4,700 c.w., 6,100, 12,500	—	0900 to 1940	—	—	
Norddeich ..	North Sea Coast 53° 36' 00" N. 07° 09' 00" E.	KAV	Day 420 Night 830	Government ..	300, 600, 1,800	PG ^{11,6}	1015 to 2130	0.37.5	3.75	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
GERMANY—contd.										
Nordholz F.R.A.	Meridian of Greenwich North Sea Coast 58° 47' 06" N. 08° 36' 27" E.	KBQ	300	Navy	600, 800	D F ⁵ 10 and Aviation P R ..	N	—	—	
Nordholz F.S.	North Sea Coast 53° 47' 00" N. 08° 38' 00" E.	KBN	—	Government ..	600, 1,250	PR ..	N	0.37.5	3.75	
Pillau F.S.	Baltic Sea Coast 19° 53' 27" E. 54° 38' 42" N.	KAP	—	Government ..	600	PR ..	N	0.37.5	3.75	
Sassnitz ..	Island of Rügen 54° 30' 52" N. 13° 39' 14" E.	KBV	110	Prussian Railway Administration	375	PR ⁹ ..	N	0.37.5	3.75	
Stolpmünde ..	54° 34' 32" N. 16° 50' 06" E.	KAY	—	—	—	D F ⁵ ..	—	—	—	
Stolpmünde F.S. and F.R.A.	Baltic Sea Coast	KAY	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Swinemünde ..	Usedom Island 53° 55' 55" N. 14° 16' 15" E.	KAW	Day 330 Night 600	Government ..	300, 600, 1,800	P G ¹² ..	N	0.37.5	3.75	
Warnemünde F.S.	Baltic Sea Coast 54° 10' 50" N. 14° 03' 04" E.	KBE	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Warnemünde F.R.A.	Baltic Sea Coast	KBY	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Warnemünde ..	54° 10' 39" N. 13° 00' 56" E.	KBY	—	—	—	D F ⁵ ..	—	—	—	
Weser Lightship	North Sea 53° 54' 18" N. 07° 49' 03" E.	KCW	80	Government ..	300	PR ¹² ..	X	0.37. ²	3.75 ²	
Wilhelmshaven ⁴ ..	Third entrance 53° 31' 16" N. 08° 09' 33" E.	KAN	—	State Marine ..	600, 800	D F ⁵ 7 and Aviation P R ¹⁶ ..	—	—	—	
Wilhelmshaven F.S.	Third entrance North Sea Coast 53° 31' 16" N. 08° 09' 33" E.	KAN	—	Government ..	600	—	N	0.37.5	3.75	
GIBRALTAR	Meridian of Greenwich									
North Front ..	36° 09' 06" N. 05° 21' 00" W.	BWW	—	British Admiralty	4,000 c.w. 4,800, 6,300	O ..	—	—	—	¹ Other wavelengths are fitted for official use only

Rock	..	36° 06' 00" N. 05° 21' 00" W.	BYW	500	British Admiralty	600, 2,400, 2,800 (c.w.)	P R ..	N	0.60	—
GILBERT & ELLICE ISLANDS. (See under PACIFIC ISLANDS)										
GOLD COAST	..	Meridian of Greenwich.								
Accra	..	05° 32' 30" N. 00° 12' 00" W.	VPG	250	Government	300, 600	P G ..	Meridian of Greenwich Mondays to Fridays 8 to 16, Saturdays 8 to 12 ¹ Sunday 8 to 10 ¹	0.40	—
GREAT BRITAIN (including IRELAND)										
Aberdeen	..	Meridian of Greenwich. 57° 11' 00" N. 02° 11' 00" W.	BYD	—	Admiralty	3,300 (c.w.)	O ..	Meridian of Greenwich. 0230 to 0830	—	—
Aberdeen	..	—	—	—	British Broadcasting Company	—	Broad-casting O ..	By arrangement	—	—
Admiralty	..	—	—	—	Admiralty	—	O ..	—	—	—
Air Ministry	..	51° 30' 00" N. 00° 10' 00" W.	BYA	250	Air Ministry	900, 1,210, 1,300, 1,400 ² 1,680 ³ , 4,100 ³ (c.w.)	O 17 ..	N	—	—
Aldershot	..	London 51° 31' 40" N. 00° 07' 10" W.	GFA	—	—	—	O ..	—	—	—
Andover	..	Hants 51° 12' 30" N. 01° 32' 30" W.	ACA GFI	—	—	—	O ..	—	—	—
Baildonne	..	53° 18' 25" N. 06° 26' 30" W.	GFB	—	—	(c.w.)	O ..	—	—	—
Ballycastle Radio	..	55° 11' 00" N. 03° 12' 00" W.	GSL	15	Post Office	250	— ³	—	—	—
Berwick	..	55° 41' 48" N. 01° 53' 43" W.	BVG	—	Admiralty	450 ³⁴	D F 31 & Civil Aviation	—	— ³⁶	— ³⁶
Bickendorf	..	Cologne 50° 59' 00" N. 06° 54' 00" E.	GEK	—	Air Ministry (Great Britain)	900, 1,400 1,680	—	0900 to 1600	—	—
Birmingham	..	Widham	5 IT	—	British Broadcasting Company	420	Broad-casting O ..	By arrangement	—	—
Bunbeg	..	Donegal North-West Coast of Ireland 55° 04' 00" N. 08° 09' 00" W.	BYR	200	Admiralty	220, 300, 600, 1,000 1,200	—	N	—	—
Caister-on-Sea Radio	..	Near Yarmouth 52° 38' 47" N. 01° 43' 51" E.	GCS	—	Post Office ⁴	1,750	— ³	—	—	—

¹ The hours of service are extended on alternate Saturdays to 0800-1300, 1700-1800, and on alternate Sundays to 0800-1000, 1700-1800 for communication with home-bound mail boats

² Government station of Imperial Chain. In addition to communicating with other fixed stations, the station also forwards radiotelegrams on a wavelength of 8,750 metres at the time and charge indicated, to ships which are fitted with continuous wave apparatus

³ Corresponds with fixed stations

⁴ For the communication with Spain

⁵ For correspondence with the Continent

⁶ For radiotelegrams exchanged with all ships except those making regular voyages not exceeding 1,000 miles to or from a port in Great Britain. In the case of radiotelegrams originating in, or destined for, Great Britain the charge is 73 centimes per word, and the charge for transmission over the land lines of Great Britain

⁷ For radiotelegrams exchanged with ships making regular voyages

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
GREAT BRITAIN (including IRELAND) —contd.										
Calshot ..	Meridian of Greenwich. 01° 18' 30" W. 50° 49' 10" N.	GFL	100	—	1,300 (c.w.)	—	N	—	—	of more than 200 miles but not more than 1,000 miles, to or from a port in Great Britain. In the case of radiotelegrams originating in or destined for Great Britain the charge is 44 centimes per word, minimum 4 fr. 40 centimes, including the coast charge, and the charge for transmission over the land lines of Great Britain. These reduced charges (coast charge and combined charge) will apply only in cases where the ship concerned does not exceed 15 centimes a word, minimum 1 fr. 50 centimes.
Cardiff ..	—	—	—	British Broadcasting Company	—	Broad-casting ³	By arrangement	—	—	
Carnarvon ..	53° 07' 00" N. 06° 17' 00" W.	MUU	—	Marconi Co. ..	14,200	—	N	—	—	
Carnore ..	52° 11' 51" N. 06° 21' 00" W.	BVZ	—	—	450	DF ..	—	—	—	
Castle Bromwich Radio	52° 31' 06" N. 01° 47' 40" W.	GEC Castle Bromwich ^{4,9}	250 100 ^{4,9}	Civil Aviation ..	900, 1,300	Civil Aviation	Sunrise to sunset	—	—	
Cattewater ..	50° 26' 46" N. 04° 07' 00" W.	GFM	250	—	1,300 (c.w.)	—	N	—	—	
Chelmsford ..	51° 43' 45" N. 00° 28' 38" E.	MZX	—	Marconi Co. ..	3,800	— ³⁸	—	—	—	
Cleethorpes Radio ..	South-East of Grimsby 53° 31' 44.4" N. 53° 03' 17.6" W.	BYB	1,000	— ^{37,38}	3,000, 4,200, 4,500, 8,000, 5,200	O ..	N	—	—	
Clifden Radio	50° 27' 00" N. 10° 01' 00" W.	MFT	2,000	Marconi Co. ..	5,780 ³⁹ , 6,000	P R ² ..	N ²⁰	1.35	—	
Corkbeg ..	Entrance to the Port of Cork 51° 48' 56.1" N. 08° 15' 20" W.	BYQ	—	Admiralty	800, 800, 1,000	O ³⁰ ..	—	—	—	
Cranwell ..	53° 02' 05" N. 00° 29' 50" W.	GFC	250	—	1,300 (c.w.)	—	N	—	—	
Cromarty ..	Black Isle 57° 41' 45" N. 04° 01' 30" W.	BYP	—	Admiralty	—	O ..	—	—	—	
Crookhaven ..	South Coast of Ireland 51° 27' 00" N. 09° 46' 00" W.	GXO	250	Post Office ..	300, 600	— ³	—	—	—	
Cross Sand Lightship	North-East of Yarmouth 52° 38' 00" N. 01° 54' 00" E.	GVA	15	Trinity House ..	230	— ⁸	N	—	—	

Croydon Radio	51° 21' 10" N. 00° 07' 40" W.	GED Croydon	400 100	Civil Aviation	900	D.F. Aviation 2 19 28 O	Sunrise to sunset	—	cases where the ship charge of the ship con- cerned does not exceed to continue a word, mini- mum 1 fr.
Culver Cliff	Isle of Wight 50° 39' 58.4" N. 01° 06' 07.8" W.	BYM	200	Admiralty	220, 600, 800, 1,000	—	—	—	8 Reception and trans- mission of distress signals of fr. A fixed charge is made of fr. 1 per radiotelegram in addition to the ordinary telegraph charges
Cullercoats 18	Near Tyneworth 52° 02' 00" N. 01° 26' 00" W.	GCC	250	Post Office	300, 600	P G 28 27 16	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷ 0.60 ²⁴	9 Reception and trans- mission of distress signals of fr. A fixed charge is made of fr. 1 per radiotelegram in addition to the ordinary telegraph charges
Devizes Radio 17 18	Near Tyneworth 51° 57' 10.7" W. 51° 24' 49.7" N.	GKU	1,000	Post Office	1,800, 2,100, 2,500, 3,000 (c.w.)	P R 16 28	N	—	10 Correspondence restricted to messages exchanged with the steamers of the South Eastern and Chatham Railway Company
Didsbury	Lanes. 53° 26' 15" N. 02° 15' 30" W.	GEM Didsbury	100 250 19	Civil Aviation	1,400	Civil Avia- tion	Sunrise to sunset	—	11 Correspondence restricted to ships of the Midland Railway Company
Donibristle	56° 02' 35" N. 03° 21' 05" W.	GFK	250	—	1,300 (c.w.)	O	N	—	12 During the passage of the steamers between Heysham and Belfast
East Goodwin Light- ship	Straits of Dover 51° 13' 00" N. 01° 36' 00" E.	GVB	15	Trinity House	230	— ⁸	N	—	13 For the communica- tion with France
Fatnet	Fastnet Rock 51° 36' 00" N.	GNJ	100	Lloyd's	300 (c.w.)	O	—	—	14 Communication re- stricted to the ships of the Great Eastern Railway Company
Felixstowe	Near Harwich 51° 57' 00" N. 51° 26' 00" E.	BYJ	—	Admiralty	—	—	—	—	15 During the passage of the steamers
Fishguard Radio 18	Pembrokeshire 52° 01' 44.5" N. 04° 59' 10.5" W.	GRL	200	Post Office	300, 600	P G 28 27 16	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷ — ²⁶	16 For the communica- tion with Switzerland
Flamborough	54° 06' 49" N. 00° 04' 56" W. 27	BVN	—	Admiralty	450 ³⁴	D F 31 & Civil Aviation P 10	—	—	17 See Time Section of Book
Folkestone Harbour Radio	Straits of Dover 51° 04' 38" N. 01° 11' 27" E.	GUR	45	South Eastern & Chatham Rail- way	300, 600	—	—	—	18 See weather Section of Book
GEZ 20 Glasgow	—	GEZ 20	—	British Broadcast- ing Company	—	Broad- casting O	By arrangement	—	19 For the Radiotele- phone Service
Grain	51° 27' 10" N. 00° 43' 15" E.	GFG	100	—	1,300 (c.w.)	—	N	—	20 The general call signal GEZ denotes any ground station of the British Royal Air Force
Grimsby Radio 18	53° 35' 07" N. 00° 04' 05.7" W.	GKZ	100	Navy	300, 600	P G 25	0700 to 2200	3.30 ⁶ 0.30 ⁶ 0.17 ⁷	21 The station advises ships approaching or leav- ing Liverpool of dangers to navigation in the Mersey
Guernsey Radio	Channel Islands 49° 27' 10" N. 02° 31' 50" W.	GKA	—	Post Office	—	— 2 30	—	—	22 The station advises ships approaching or leav- ing Southampton of dan- gers to navigation in the Solent
Gull Lightship	Straits of Dover 51° 16' 00" N. 01° 28' 00" E.	GVC	15	Trinity House	230	— ⁸	N	—	23 Experimental station
Heysham Harbour Radio	Irish Sea, Morecambe Bay 54° 02' 00" N. 02° 55' 00" W.	GKG	150	Midland Railway	400	P 11	N 12	—	24 In the case of radio- grams originating in or
Horsea	Near Portsmouth 50° 50' 15" N. 01° 06' 10" W.	BYC	—	Admiralty	6,000	O	—	—	
Howden	53° 47' 10" N. 00° 52' 15" W.	GFZ	250	—	1,300 (c.w.)	O	N	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Wavelength in Heavy Typo).	Nature of Service.	Hours of Service.	Cost Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
GREAT BRITAIN (including IRELAND)										
Inchkeith	Meridian of Greenwich. Firth of Forth 56° 01' 59" N. 03° 08' 04" W.	EZA	—	Admiralty	600	O ..	—	—	—	destined for Great Britain the charge is 73 centimes per word, including the coast charge, and the charge for transmission over the land lines of Great Britain
Ipswich	52° 03' 18" N. 01° 08' 28.2" E.	BYE	—	Admiralty	2,400	O ..	—	—	—	
Isle of Man Radio ..	54° 09' 00" N. 04° 30' 00" W.	GDX	—	—	—	— 2 30	—	—	—	
Kingstown	53° 17' 49" N. 06° 08' 20" W.	BWK	—	Admiralty	2,080	O ..	—	—	—	
Land's End Radio ¹⁸	West Coast of Cornwall 50° 07' 00" N. 03° 40' 10" W.	GLD	250	Post Office	300, 600	P G 12 26 27	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷	3.30 ⁶ 1.70 ⁷	²⁰ The station communicates only with ships that are fitted with c.w. apparatus
Leafield	50° 07' 00" N. 03° 40' 10" W.	GBL	—	Post Office	8,750 (c.w.) 9,260, 9,400	—	—	—	—	
Lea-on-Solent ²³ ..	50° 48' 25" N. 01° 12' 25" W.	GFW	250	—	900 , 1,300 (c.w.)	—	—	—	—	
Lerwick Radio ..	Shetland Islands 03° 11' 00" W. 60° 09' 00" N.	GEL	250	—	600, 900 , 1,400 (spark)	O ..	—	—	—	
Lizard	40° 59' 02" N. 05° 12' 24" W.	BVY	—	Admiralty	450 ³⁴	D F 31 & Civil Aviation	—	—	—	
Lochboisdale Radio	Hebrides 52° 08' 00" N. 07° 16' 00" W.	GCB	150	Post Office	300	— 2 30	0800 to 2000 Weekdays only	—	—	
London (see Marconi House)	51° 04' 40" N. 01° 00' 50" E.	2 LO	—	British Broadcasting Company	369	Broad-casting	By arrangement	—	—	
Lymington Radio ..	North Coast of Ireland 53° 22' 00" N. 07° 20' 00" W.	GEG Lymington	100, ¹⁹ 250	—	900 ¹⁹	—	From sunrise to sunset	—	—	
Malin Head Radio ¹⁸	—	GMH	250	Post Office	300, 600	P G 12 26 27	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷	3.30 ⁶ 1.70 ⁷	²⁷ The station issues gale warning for wind above 40 miles per hour (force 8 or stored
Manchester	53° 16' 00" N. 02° 15' 00" W.	2 ZY	—	British Broadcasting Company	385	Broad-casting Civil Aviation	By arrangement	—	—	
Manchester	—	GEM	—	Air Ministry	900, 1,300	—	Sunrise to sunset	—	—	

Marconi House (London)	London	2 LO	Experimental	369	Broad- casting	By arrangement		Butfort Seal) within 150 miles of the station Message is preceded by III sent about ten times at short intervals. The signals are repeated at the commencement of the next single operation period for ships carrying only one operator
Newcastle	Essex	2 NO	British Broadcast- ing Company	400	Broad- casting	By arrangement	—	—
North Weald, North Station (A)	Essex	GLA	Marconi Co.	3,800	French Service	N	—	—
North Weald, North Station (B)	Essex	GLB	Marconi Co.	2,900	Swiss Service	N	—	—
North Weald, North Station (C)	Essex	GLO	Marconi Co.	4,350	Spanish Service	N	—	—
Newhaven Radio	50° 48' 09" N. 00° 03' 30" E. Isle of Wight	GNV	London, Brighton & S.C. Railway	800, 600	— ²	N	—	—
Niton Radio ¹⁸	50° 35' 41.8" N. 01° 17' 00" W.	GNI	Post Office	300, 600	P G ^{28 27}	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷	—
North Foreland Radio	North of Ramsgate	GNF	Post Office	300, 600	P G ^{16 28}	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷	—
Northolt Radio	51° 23' 00" N. 01° 26' 00" E.	GKB	Post Office	6,890	— ²	—	—	—
Ongar Radio	50° 21' 35" W. 51° 33' 08" N.	GLA	Marconi Co.	2,400 ¹⁸ (c.w.)	— ²	—	—	—
Ongar Radio	50° 11' 18" E. 51° 42' 58" N.	GLB	Marconi Co.	3,950 ¹³ (c.w.)	— ²	—	—	—
Ongar Radio	51° 18' 18" E. 51° 42' 51" N.	GLO	Marconi Co.	4,350 ³ (c.w.)	— ²	—	—	—
Oxford Radio	50° 11' 18" E. 51° 42' 51" N.	GBL	Post Office	8,750, 12,300	— ¹	—	—	—
Parkeston Quay Radio	51° 32' 47" W. 51° 49' 57.5" N.	GPQ	Great Eastern Railway	450, 600	P ¹¹	0100 to 0200 / N ¹⁵	1.35	—
Pembroke	51° 56' 58" N. 01° 15' 12" E.	BYF	Admiralty	2,080, 2,400, 4,800	O	—	—	—
Plymouth	51° 41' 30" N. 04° 57' 31.7" W.	BYP	— ^{2 28}	220	O	—	—	—
Plymouth	50° 11' 00" W. 50° 22' 43" N.	—	British Broadcast- ing Company	—	Broad- casting	By arrangement	—	—
Foldhu ¹³	—	MPD	Marconi Co.	—	Experi- mental	—	—	—
Poole	Extreme South- west of England	MHH	Marconi Co.	—	— ^{2 3}	—	—	—
Portland Bill	50° 01' 44" N. 05° 15' 43" W.	BYN	Admiralty	600, 800	O ³⁰	—	—	—
Port Patrick Radio ¹⁸	The Haven 50° 40' 00" N. 01° 56' 00" W.	GPK	Post Office	300, 600	P G ^{28 16}	0800 to 2300	0.60 ⁵ 0.33 ⁶ 0.17 ⁷	—
Portsmouth School	English Channel 50° 31' 13.8" N. 02° 27' 17.6" W.	BZC	Admiralty	—	O	—	—	—
	Scotland, North Channel							
	54° 51' 37.2" N. 05° 07' 23.8" W.							
	50° 48' 00" N. 01° 06' 00" W.							

The ship

handing in is always ex-

degrees of the ship from

clockwise from true north,

by a group of three figures

(000 to 359), measured

of the station from which

the bearing was made and

followed by the call signal

result by the signal QTE,

coast station gives the

taking the bearing. The

450 signifying that the

ship will transfer to 450

metres wavelength for

call is not made on the

450 metres wavelength

required and also if the

from which bearings are

signalling QTB with the

appropriate wavelength,

ships should call a D.F.

at Ships requiring bear-

30 Station temporarily

messages to ships

(G.M.T.), on a wavelength

of 5,780 metres. (B) Press

bulletins at 0950 and 2150

(G.M.T.), on a wavelength

of 5,780 metres. (B) Press

of radiotelegrams to ships

restricted to transmission

29 (A) Correspondence

ponds with aircraft

operator

single operation period for

signals are repeated at the

at short intervals. The

Message is preceded by

of the station

Butfort Seal) within 150

miles of the station

Tongue Lightship	15	Trinity House	230	— ⁸	N	— ⁹	— ⁹
Valentia Radio ¹⁸	250	Post Office	300, 600	P G ^{18 28 27}	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷ 1.47 ⁷	3.30 ⁶ — —
Wick Radio ¹⁸	—	Post Office	300, 600	P G ^{18 28 27}	N	0.60 ⁵ 0.33 ⁶ 0.17 ⁷ 1.70 ⁷	3.30 ⁶ — —
Writtle	—	Marconi Scientific Inst. Co.	400	Experi- mental	By arrange- ment	—	—
GREECE							
Athens ⁵ SXA	—	Government	1,200	O	—	—	—
Athens, No. 2 ²	150	—	300, 600	P G	0600 to 2000	0.40	4.00
Athens, No. 3 ¹	—	—	—	O ^{3 4}	—	—	—
Athens SXG	—	—	3,000, 3,600 ^{3 4} 4,400	—	—	—	—
Candia	—	Navy	900, 2,000	O	—	—	—
Corfu ⁵	—	—	—	O	—	—	—
Dédagach ⁵	—	—	—	O	—	—	—
Fassa ⁵	—	—	—	O	—	—	—
Poros ⁵	—	—	—	—	—	—	—
Salamis ⁵	—	Government	—	O	—	—	—
Salonika ⁵	—	Government	—	O	—	—	—
Vari	—	—	—	—	—	—	—
GUADELOUPE AND DEPENDENCIES							
Destrellan ¹	400	Government	600, 800, 1,200, 1,500	P G ¹	0600 to 2100	0.30 ²	—
¹ The station also com- municates with Fort de France and Trinidad ² For ordinary radio- telegrams the charge is reduced by 50 per cent. ³ For official radiotele- grams ⁴ 20th time-belt east of the Greenwich belt							

¹ New stations not yet
open to public corre-
pondence. Press com-
munication is transmitted
at 1500 from Athens new
station

² The accounts are set-
tled by the Ministry of
Posts, Telegraphs and
Telephones, Athens

³ The station sends out
a weather bullet in at
0705 (G. M. T.) on a
wavelength of 3,600
metres.

⁴ The station sends out
a press bulletin at 1500
(G. M. T.) on a wavelength
of 3,600 metres

⁵ Government traffic
with ships

¹ The station also com-
municates with Fort de
France and Trinidad
² For ordinary radio-
telegrams the charge is
reduced by 50 per cent.
³ For official radiotele-
grams
⁴ 20th time-belt east of
the Greenwich belt

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
HAITI REPUBLIC										
Port-au-Prince ..	Meridian of Greenwich. 18° 33' 18" N. 72° 19' 52" W.	NSC	300, 600	U.S. Navy	600, 975, 2,250, 2,400, 3,825, 3,950, 2,250 C.W.	P G ..	N	0.30	—	
HAWAIIAN ISLANDS (SANDWICH ISLANDS)										
Honolulu ..	—	KDXX	—	Star Bulletin	360	P R ..	X	—	—	¹ The station only communicates with fixed stations
Honolulu ..	Pearl Harbor 15° 52' 00" W. 21° 26' 45" N.	KYQ	100	The Radio Shop	200, 340	P R ² ..	X	—	—	
Honolulu ..	Hawaii 15° 58' 00" W. 21° 26' 45" N.	KGU	50	Marion A. Mulrony	360	P R ¹ ..	2000 to 2100	—	—	² The Station sends time signals daily from 1155 to 1200 (time of the Meridian 180°). The wavelengths of 11,500 metres (arc) and 2,250 metres (spark)
Honolulu NPM	Island of Oahu 15° 58' 00" W. 21° 26' 45" N.	NPM	—	U.S. Navy	507, 600, 975, 2,250, 2,400 2,650, 3,950, 4,800	O ..	N	—	—	
Kahuku (Oahu Station)	—	KGI	—	Radio Corp. of America	16,300	P R ..	N	—	—	
Kahuku ..	—	KIE	4,000	Radio Corp. of America	9,145, 16,975	P R ..	N	—	—	
Kaunakakai ..	Island of Molokai 21° 05' 21" N. 157° 01' 29" W.	KHO	30	Mutual Telephone Co., Ltd.	300, 550, 600	— ¹	N	—	—	
Kawaihae ..	Island of Hawaii 20° 02' 38" N. 155° 50' 05" W.	KHN	300	Mutual Telephone Co., Ltd.	300, 550, 600	P R ..	N	—	—	
Lahaina ..	Island of Maui 20° 32' 29" N. 156° 40' 50" W.	KHL	300	Mutual Telephone Co., Ltd.	300, 550, 600	— ¹	N	—	—	
Lihue ..	Island of Kauai 21° 57' 58" N. 159° 22' 16" W.	KHM	300	Mutual Telephone Co., Ltd.	300, 550, 600	P R ..	N	—	—	
Pearl Harbour ..	Island of Oahu 21° 18' 23" N. 157° 51' 56" W.	NPM	300, 500	U.S. Navy	600, 11,200	O ² ..	N	—	—	
Wahiawa ..	21° 29' 28" N. 158° 02' 37" W.	KHK	250	Mutual Telephone Co., Ltd.	300, 550, 600	P G ..	N	0.30	—	

HOLLAND (NETHERLANDS)		Meridian of Greenwich.	PCA	—	Government	..	400, 600, 1,800, 2,800 600	O ..	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Amsterdam	..	52° 22' 27" N. 04° 54' 45" E.	PCA	—	Government	..	400, 600, 1,800, 2,800 600	O ..	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Flushing	..	51° 26' 52" N. 03° 35' 35" E.	PCD	200	—	..	600	O ..	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Flushing (Buifed)	..	51° 26' 52" N. 03° 35' 35" E.	PCC	—	—	..	400	— 1	X	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Haaks Lightship	..	West of Helder	PCO	40	Government	..	300, 400, 600	— 1	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Hague (The)	..	52° 58' 00" N. 04° 18' 31" E.	PCGG	—	—	..	1,950	Broadcast by arrange- ment	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Helder PCB	..	52° 57' 49" N. 04° 46' 33" E.	PCB	—	Government	..	600	O ..	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Helder PCC	..	04° 46' 23.5" E. 52° 27' 05" N.	PCC	—	—	..	600	O ..	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Kootwijk-Sambeck	..	52° 27' 05" N.	PCG	—	—	..	6,650, 13,250, 17,750 400, 600	—	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Mok (De)	..	53° 00' 02" N. 04° 45' 56.5" E.	PCE	40	—	..	400	— 1	X	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Nieuwediep	..	53° 00' 02" N. 04° 45' 56.5" E.	PCB	—	Government	..	300, 400, 600	— 1	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Noord-Hinder Light- ship	..	North Sea 51° 35' 30" N. 02° 36' 43" E.	PCN	40	—	..	1,000, 3,000 900	Aviation	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Rotterdam	..	51° 53' 00" N. 4° 27' 00" E.	RDM Rotter- dam	—	—	..	300, 500, 800 1,800	PG	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram
Rotterdam	..	51° 53' 00" N. 4° 27' 00" E.	PCH	250	Government	..	300, 500, 800 1,800	PG	—	—	1 The station is intended for: (a) the transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight or the re- transmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen- Port coast station; (b) meteorological services on or intended for ships and forwarded the Schev- eningen-Port are subject to the charge for trans- mission over the inland telegraph lines, and a fixed charge of fr.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
HONG KONG—contd.										
Stonecutters Island..	Meridian of Greenwich. 22° 25' 00" N. 114° 05' 00" E.	BXY	1,000	British Admiralty	600, 2,000 ¹ (spark) 4,000, 4,200 (arc), 5,000	O ¹ ..	—	—	—	International Time and Weather Signals) ² The station sends out a summary of meteorological conditions and weather forecasts at 0500 and 0900
HUNGARY										
Budapest	Meridian of Greenwich. 19° 03' 26" W. 47° 28' 29" N.	HB HB	— 1,070	—	3,000 2,000 to 7,000, 4,700	—	—	—	—	¹ Communicates with fixed stations only
ICELAND										
Flatøy & Breidafirdi	Meridian of Greenwich. 65° 22' 30" N. 22° 55' 24" W.	TFB	250	Government ..	300, 600	P G ..	Meridian of Greenwich. 1100 to 1300 1700 to 1900 2100 to 2300	0.40	4.00	
Reykjavik Radio ..	64° 08' 55" N. 21° 57' 11" W.	TFA	500	Government ..	300, 600, 900, 1,800	P G ..		0.40	4.00	
Vestmannaeyjar Radio	Vestmann Islands 20° 16' 10" W. 63° 26' 20" N.	TFC	200 ¹	—	600, 1,450	P G ..	X	0.40	4.00	
ITALIAN SOMALILAND										
Bardera	Meridian of Greenwich. ² 02° 21' 10" N. 42° 16' 15" E.	ISN	200	Government ..	700, 750	P G ³ ..	0600 to 0630 0730 to 0830 0900 to 1030 1130 to 1230 1330 to 1400 1530 to 1630 1730 to 1800 0700 to 0730 0900 to 0930 1100 to 1130 1300 to 1330 1500 to 1530 1700 to 1730	0.30	—	¹ The charge applicable to the transmission of radiotelegrams between the stations of Italian Somaliland is fixed at fr. 2.52 per radiotelegram of ten words or less, with fr. 0.25.20 additional for each word over ten. ² Italian Somaliland official time, 3 hours in advance of Greenwich time
Brava	Benadir 01° 06' 25" N. 44° 02' 04" E.	ISC	120	Government ..	700, 750	P G ..		0.60	—	

Bulo Burti ..	ISJ	100	Government	600	P G ..	0630 to 0700 0830 to 0900 1030 to 1100 1200 to 1300 1430 to 1500 1630 to 1700	0.30	—	a The station corresponds with fixed stations only
Giumbo ..	ISD	200	Government	700, 750	P G ..	0700 to 0800 0900 to 1000 1100 to 1200 1300 to 1400 1500 to 1600 1700 to 1800	0.60	—	
Ischia Baidoa	ISH	100	Government	300, 600, 800	P G ..	0600 to 0630 0800 to 0830 1000 to 1030 1200 to 1230 1400 to 1430 1600 to 1630	0.30	—	
Itala ..	ISM	50	Government	300	P G ..	0630 to 0700 0830 to 0900 1030 to 1100 1230 to 1300 1400 to 1500 1630 to 1700 0800 to 1700	0.60	—	
Kismayu ..	YQQ	300	Government	600	P G ..		0.60	—	
Lugh ..	ISO	100	Government	300	P G ..	0600 to 0630 0730 to 0830 0930 to 1030 1130 to 1200 1330 to 1430 1530 to 1630 1730 to 1830	0.30	—	
Mahaddet Uen	ISF	160	Government	600	P G ..	0630 to 0700 0830 to 0900 1030 to 1130 1230 to 1300 1430 to 1500 1600 to 1700 0700 to 0730 0900 to 0930 1100 to 1130 1300 to 1330 1500 to 1530 1700 to 1730	0.30 ¹	—	
Merka ..	ISB	50	Government	300	P G ..		0.60	—	
Mogadiscio (Mogadishu)	ISE	160	Government	4,000	P G ..		0.60	—	
Mogadiscio, I.S.G. (Mogadishu)	ISG	—	—	—	Special		—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.	
								Per Word.	Minimum Charge.		
ITALIAN SOMALILAND—<i>contd.</i>											
Oddur ..	Meridian of Greenwich. 04° 07' 05" N. 43° 45' 00" E.	ISI	100-150	Government	300, 600	P G ..	0600 to 0630 0800 to 0830 1000 to 1030 1200 to 1230 1400 to 1430 1600 to 1630	0.30	—		
ITALY											
Alessandria ..	Meridian of Greenwich. 13° 31' 50" E. 43° 37' 00" N. 13° 31' 25" E. 43° 31' 30" N.	—	—	Army	—	— ⁷	—	—	—	¹ The accounts are settled by the Postal and Telegraph Administration	
Ancona IQW ..		IQW	—	Army	—	— ¹⁰	—	—	—	² The station cannot answer the calls from ships, but is in direct communication by telegraph with Carbonara W/T station (ICZ)	
Aspio Radio ..		ICA	270	Government	300, 600	P G ..	—	N	0.60	—	³ This station is opened for public service direct to the Italian Somaliland and Erythraea, communicating with Mogadiscio (Italian Somaliland) and Massaua ICX (Erythraea)
Bologna G'RH ..		—	—	—	Army	—	— ⁷	—	—	—	⁴ The Stromboli station takes the place of the Messina radio station when the latter is occupied with military communications
Brescia ..		—	270	Army	—	— ⁷	—	—	—	—	⁵ A charge of 6 fr. will be made for each bearing
Brindisi Radio ¹ ..	Coast of the Adriatic Sea, Puglie, Province of Lecce 40° 38' 45" N. 17° 57' 08" E.	ICE	300 (c.w.)	Government	300, 600, 2,400 (arc)	—	N ⁸	—	—	⁶ The station keeps watch on the 2,400 metres wavelength, c.w., for 15 minutes at 0345, 0745, 1145, 1545, 1945, 2345	
Cagliari ..	—	—	—	Army	—	— ⁷	—	—	—		
Capo Sperone Radio ..	Sardinia, Island of S. Antioco 38° 57' 59" N. 08° 24' 42" E.	ICR	270	Government	300, 600	P G ..	N	0.60	—		
Catania ..	—	—	—	Army	—	— ⁷	—	—	—		
Catanzaro ..		—	—	Army	—	— ⁷	—	—	—		
Chieti ..		—	—	Army	—	— ⁷	—	—	—		
Civitavecchia Radio ..	11° 47' 25.9" E 42° 05' 21" N. 17° 07' 56" E. 39° 04' 50" N.	IDL	120	—	300, 600	P G ..	N	0.60	—		
Cotrone Radio ..	—	IDH	120	—	300, 600	P G ..	N	0.60	—		
Cuneo ..	—	—	—	Army	—	— ⁷	—	—	—		
Firenze (Florence) ..	43° 40' 36" N. 11° 10' 25" E.	—	—	Army	—	— ⁷	—	—	—		

[illegible]

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge	
ITALY—contd.										
Stromboli	Meridian of Greenwich. 15° 14' 30" E. 38° 48' 10" N.	IDE	122	Government ..	300, 600	— ⁴	—	0.60	—	
S. Cataldo di Bari	16° 50' 47" E. 41° 08' 23" N.	ICQ	120	Army ..	300, 600	P G ¹¹ ..	N	0.60	—	
Taranto	17° 18' 02" E. 40° 28' 02" N.	ICT	—	Army ..	—	— ¹⁰	—	—	—	
Tempio	Sardinia 40° 53' 56" N. 09° 06' 08" E.	IDR	270	—	2,400 (arc)	P G ¹¹ ..	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.60	—	
Tivoli	Pola	IQV	—	—	800	— ⁷	—	—	—	
Torino (Turin)	45° 38' 54" N. 13° 45' 29" E.	IQX	200	Army ..	300, 600	P G ¹¹ ..	N	0.60	—	
Trieste Radio	13° 10' 45" E. 38° 42' 25" N.	IDS	—	—	—	— ⁷	—	—	—	
Ustica	12° 21' 10" E. 45° 28' 50" N.	ICZ	200	—	300, 600	P G ¹¹ ..	N	0.60	—	
Venezia Radio(Venice)	—	—	—	—	—	— ⁷	—	—	—	
Verona	Calabria, Strait of Messina	IFV	—	Army .. Government (State Railways)	—	— ⁷	—	—	—	
Villa San Giovanni ..	38° 10' 00" N. 15° 38' 00" E.	—	—	—	—	— ⁷	—	—	—	
Vittoria Radio ..	Sicily, Province of Syracuse 14° 32' 00" E. 36° 57' 00" N.	ICV	270	Government ..	300, 600	P G ..	N	0.60	—	
JAMAICA (See under BRITISH WEST INDIES)										
JAPAN										
Choshi	Meridian of Greenwich. Hondo, Inuboye Point 35° 44' 08" N. 140° 51' 12" E.	JCS	550	Ministry of Communications	300, 600, 1,800	P G ¹²	N	0.60	—	¹ The station transmits each night (except Sundays) time signals on a wavelength of 600 metres.

Dairenwan .. (Darien-Dalny)	Peninsula of Kwan-Tung 38° 57' 50" N. 121° 53' 15" E. Taiwan (Formosa) 25° 18' 00" N. 121° 32' 00" E. Tokyo Owan, near Funabashi	JDA	Day 350 Night 1,200	—	300, 600	P G ^{2,4}	N ⁵	0.60	—	the mean time of Central Japan (time of the meridian 135° E.). (See International Time and Weather Signals)
Fukikaku ..	..	JFK	—	Government ..	300, 600	—	—	—	—	² The stations Choshi Radio, Keelung Radio and Dairenwan, transmit warnings of typhoons. No charge is made for these messages except when a special request of the ship. (See International Time and Weather Signals)
Funabashi Radio ..	..	JJC	—	Ministry of Marine and Ministry of Communication	4,000, ⁶ 7,000, 5,000	O ⁶	—	—	—	³ Mean time of the meridian 135° E. of Greenwich
Horomushiro Radio ..	..	JHJ	550	Ministry of Communications	300, 600, 1,800	P G ¹²	N ¹³	0.60 ¹⁰	—	⁴ The greater part of the day, that is, during the hours mentioned below and certain hours during the night are principally occupied with official correspondence: 0800-0900, 0930-1100, 1130-1300, 1330-1500, 1530-1700, 1730-1800
Iwakiri Radio ..	..	JAA	—	Ministry of Communications	—	—	—	—	—	⁵ The station only corresponds with Japanese stations
Kelung Radio ..	..	JFK	1,000	Ministry of Communications	300, 450, 600, 1,800, 2,500	P G ³	N	0.60	—	⁶ The station transmits each night except Sundays on a wavelength of 4,000 metres time signals. (See International Time and Weather Signals)
Komonto ⁷ ..	..	JKM	200	—	—	— ⁸	N	—	—	⁷ Lighthouse
Maizuru ..	..	JMZ	—	Ministry of Communications	600, 900, 3,500 ⁹	P G	N	0.60	—	⁸ Correspondence limited to the other light-houses in Chosen, with the ship Kosai Maru, belonging to the Chosen Government, and Japanese Warships
Minamioagarajima ..	..	JYU	200	—	300, 600	— ⁵	1900 to 2400 ³	—	—	⁹ For official correspondence
Mokpo ⁷ ..	..	JMP	200	—	—	— ⁸	N	—	—	¹⁰ This charge includes the charge for transmission between Horomushiro Radio and Otchishi Radio
Osezaki Radio ..	..	JOS	550	Ministry of Communications	300, 600, 1,800	P G	N	0.60	—	¹¹ Public correspondence with the Japanese ship stations
Otchishi Radio ..	..	JOC	550	Ministry of Communications	300, 600	P G	N	0.60	—	¹² This station connects with the International
Otamari Radio ..	..	JTW	450	General Direction of Posts and Telegraphs	300, 600, 1,800	P G	N	0.60	—	
Rasajima ..	..	JSA	450	Ministry of Communications	300, 600, 1,800	P R ¹¹	—	—	—	
Shimotsui ..	..	JSX	300	Ministry of Communications	300, 600, 1,800	P G	N	0.60	—	

Land Stations--Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Francs.	Remarks.
								Per Word.	Minimum Charge.
JAPAN—contd.									
Shiomisaki ..	Meridian of Greenwich. Hondo, Kii Channel 33° 25' 32" N. 135° 46' 08" E.	JSM	450	Ministry of Communications	300, 600	P G ..	N	0.60	—
Shogetsu-buto ?	Chosen, Port of Chemulpo 37° 28' 10" N. 126° 36' 22" E.	JSB	200	—	—	— ^s	N	—	—
Shoseito ^s ..	Chosen, Island of Shoseito 37° 45' 36" N. 124° 43' 45" E.	JSS	300	—	—	— ^s	N	—	—
Tsunoshima ..	Hondo, near Shimono-seki 34° 21' 06" N. 130° 50' 00" E.	JTS	450	Ministry of Communications	300, 600	P G ..	N	0.60	—
KENYA COLONY AND PROTECTORATE									
Mombasa ..	Meridian of Greenwich. 04° 02' 31" S. 39° 39' 10" E.	VPQ	350	Government ..	300, 600, 1,800	P G ..	Local Time ¹ 0800 to 1700	0.60	—
Moyale ..	—	VQU	—	—	—	—	—	—	—
Sankuri ..	—	VOS	—	—	—	—	—	—	—
Serenli ..	—	VOR	—	—	—	—	—	—	—
Wajbeh ..	—	VQT	—	—	—	—	—	—	—
LABRADOR (See under NEWFOUNDLAND)									
LETONIA (LATVIA)									
Leepja ..	—	LEJ	—	—	1,100	—	—	—	—
Leepaja ..	21° 00' 36" E. 56° 32' 48" N.	KCB	200	Posts and Telegraphs	600, 800, 1,200	P G ..	N	0.25	2.00
Riga ..	24° 05' 25" E. 56° 50' 52" N.	KCA	500	Posts and Telegraphs	600, 700, 1,400, 1,500, 1,600, 1,000	P G ..	N	0.25	2.00
Riga ..	—	RGA	—	—	—	—	—	—	—

Wentspils ¹	KCC	—	Posts and Tele- graphs	—	O ²	N	0.25	2.00	² The station is open principally for official correspondence. It accepts general public correspondence if the radiotelegrams are destined for Wentspils or if for any reason other coast stations in Lettonia do not reply
LIBERIA									
Montrovia ²	FMA	06° 16' 40" N. 10° 49' 36" W.	400	French Govern- ment	600	P G ¹	0.45	—	¹ The station also communicates with Conakry.
LITHUANIA									² The accounts are settled by the Office Radiotélégraphique de l'Afrique Occidentale Française
Kovno	KOV	—	—	—	1,200	—	—	—	
MACAO									
S. Francisco ¹	CRS	Meridian of Greenwich. 113° 33' 42" E. 22° 11' 36" N.	Day 50 Night 100	Portuguese Postal and Telegraph Administration	300, 600	P R	0.60	6.00	¹ Accounts settled by the Direction of Posts and Telegraphs of the Province of Macao, Macao
MADAGASCAR									
Diégo-Suarez	FDG	North of Madagascar 12° 15' 04" S. 49° 22' 45" E.	Day 325 Night 650	French Govern- ment	300, 600	P G ^{1 2}	0.50	—	¹ The station also communicates by radiotelegraph with Drandzi. In case of interruption of the inland telegraph lines, the stations exchange by radiotelegraphy the island of Diégo-Suarez and Majunga
Dzandzi	FDO	Mayotta Island 12° 46' 55" S. 45° 16' 29" E.	430	French Govern- ment	300, 600	P G ^{2 4}	0.50	—	stations exchange by radiotelegraphy the island of Diégo-Suarez and Majunga
Majunga	FJA	Mozambique Channel 15° 43' 00" S. 46° 20' 14" E.	430	French Govern- ment	300, 600	P G ^{1 2}	0.50	—	whole of the service the stations will be on watch, during the first quarter of each hour except between 0015 and 0600
Mutsamudu	FLU	Johanna (Comoro Islands) 12° 09' 26" S. 44° 24' 27" E.	100	French Govern- ment	600	P G	0.50	—	² A service giving warning of the passage of cyclones has been organised as an experiment on the east, north-west, and west coasts of Madagascar. (See International Time and Weather Signals)
									³ Third time belt east of the Greenwich belt
									⁴ The station also communicates by radiotelegraph with Maitunga

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs. Per Word.	Remarks.
MALTA	Meridian of Greenwich.								
Malta Island	St. George's 35° 55' 00" N. 14° 29' 00" E.	VPT	—	—	2,800 c.w., 3,300	—	—	—	¹ The station sends out weather bulletins at 0900 and 2100 (G.M.T.) on a wavelength of 4,200 metres (c.w.) ² Open for commercial working
Rinella	35° 53' 00" N. 14° 32' 00" E.	BYZ	—	British Admiralty	4,200 ¹ , 2,700	O	—	—	
S. Angelo ²	35° 55' 00" N. 14° 31' 00" E.	BYV	500	British Admiralty	600	P G	N	0.60	
MARSHALL ISLANDS (See under PACIFIC ISLANDS JAPAN)									
MARTINIQUE	Meridian of Greenwich								
Fort de France	14° 35' 30" N. 61° 04' 00" W.	FKQ	300	French Navy	600 ¹ (c.w.)	P G ²	N	0.30 ¹	¹ Radiotelegrams to or from officers or crew of warships are free of charge ² General public correspondence may be admitted if the station is not engaged with official correspondence
MAURITIUS	(Port Louis Harbour) The Tug "Labourdonnais"	VRK	—	—	300, 600	—	0400 to 0800 1200 to 1400	—	¹ As the naval wireless station at Mauritius has been closed, its service with ships is being undertaken for the present by the tug "Labourdonnais"
MEXICO	Meridian of Greenwich.								
Acapulco de Guerrero	16° 50' 41" N. 99° 34' 46" W.	XAK	300	Government	600, 900 ² , 1,200 ¹	P G	Meridian of Tucubaya ¹ 0800 to 2200	0.45	¹ Mean time of the meridian of Tacubaya; 6 hours 36 minutes 46.67 seconds later than Greenwich time
Alamos de Sonora	27° 01' 19" N. 108° 55' 59" W.	XAD	500	Government	600, 900 ² , 1,200 ¹	P G	0800 to 2200	0.45	
Campeche	19° 51' 40" N. 99° 34' 36" W.	XAB	300	Government	600, 750, 900 ² , 1,180	P G	0800 to 2200	0.45	² For correspondence with fixed stations
Guaymas	Sonora 27° 55' 00" N. 110° 58' 00" W.	XAH	200	Government	600, 750, 900, 1,180	P G	0800 to 2200	0.45 ²	

	XAD	300	Government	600, 750, 900 ²	P G	0800 to 1900	0.45	4.50
Maria Madre	Noyarit 106° 35' 25" W. 21° 37' 11" N.	300	Government	600, 750, 900 ²	P G	0800 to 1900	0.45	4.50
Mazatlan de Sinaloa	Sinaloa 106° 12' 00" N. 106° 25' 00" W.	300	Government	600, 900 ²	P G	0800 to 2200	0.45	4.50
Merida de Yucatan	20° 58' 05" N. 89° 37' 21" W.	300	Government	600, 900 ² 1,200 ²	P G	0800 to 2200	0.45	4.50
Payo Obispo	Quintana Roo 18° 33' 00" N. 88° 35' 00" W.	300	Government	600, 750, 900, ² 1,180	P G	0800 to 2200	0.45	4.50
Paz de la Baja (La)	Gulf of California 24° 10' 12" N. 110° 21' 05" W.	300	Government	600, 900 ² 1,200 ²	P G	0800 to 2200	0.45	4.50
Port Lobos	Vera Cruz 21° 28' 00" N. 97° 13' 03" W.	300	Government	600, 900 ² 1,200 ²	P G	0800 to 2200	0.45	4.50
Salina Cruz	Oaxaca 16° 10' 37" N. 95° 12' 11" W.	300	Government	600	P G	0800 to 2200	0.45	4.50
San Jose del Cabo	23° 03' 00" N. 109° 42' 00" W.	—	Government	600, 900	—	—	—	—
San Nicolas	—	—	—	—	—	—	—	—
Santa Rosalia	Lower California 27° 24' 00" N. 112° 20' 00" W.	100	Government	600	P G	0800 to 2200	0.45	4.50
Tampico de Tam-	22° 13' 00" N. 97° 31' 19" W.	300	Government	600, 900 ² 1,200 ²	P G	0800 to 2200	0.45	4.50
aulipas	20° 57' 18" N. 97° 23' 59" W.	300	Government	600, 900 ² 1,200 ²	P G	0800 to 2200	0.45	4.50
Tuxpan de Vera Cruz	19° 12' 50" N. 96° 08' 16" W.	500	Government	600, 750, 900, 1,180	P G	0800 to 2200	0.45	4.50
Vera Cruz	—	—	—	—	—	—	—	—
MOROCCO	Meridian of Greenwich.	—	—	—	—	Meridian of Greenwich.	—	—
Agadir	Maroc 33° 35' 30" N. 07° 37' 00" W.	430	French ment	600 300, 600	P G	0600 to 2400	0.25	—
Casablanca	Chétéba 33° 35' 21" N. 07° 34' 10" W.	300	—	600, 800	D F and Aviation	—	—	—
Casablanca ²	33° 35' 21" N. 07° 34' 10" W.	—	—	—	D F ¹	N	—	—
Chétéba Gonio ^{2,3}	33° 35' 21" N. 07° 34' 10" W.	160	French Navy	450	D F and Aviation	—	—	—
Kenitra	34° 18' 49" N. 06° 35' 42" W.	430	French ment	300, 600	P G	0600 to 2400	0.25	—
Mogador	31° 31' 00" N. 09° 46' 00" W.	—	French ment	450	—	—	—	—
Rabat	34° 02' 15" N. 06° 50' 30" W.	430	French ment	300, 600	P G	0600 to 2400	0.25	—
Tangier	35° 47' 15" N. 05° 49' 00" W.	—	French ment	300	—	—	—	—
Tangier Legation	—	—	—	—	—	—	—	—

¹ A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of the radio compass work.

² Works in conjunction with Casablanca (Morocco).

³ The accounts are settled by the Office des Postes, des Télégraphes et des Téléphones du Maroc, Rabat.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
MOZAMBIQUE (PORTUGUESE EAST AFRICA)	Meridian of Greenwich.						Mean Time of the Meridian 30° East of Greenwich.			¹ The station transmits daily at 1000 2100, time signals and information concerning the meteorological conditions, furnished by the observatory of Campos Rodrigues (Lourenço Marques). (See International Time and Weather Signals)
Beira	10° 50' 16" S. 34° 00' 48" E.	CRT	200	Direction of Posts and Telegraphs	600, 900, 1,000	P G ..	0800 to 2400	0.60	—	² The accounts are settled by the Direction of Posts and Telegraphs of the Province of Mozambique, Lourenço Marques
Chai-Chai	23° 51' 55" S. 35° 22' 50" E.	CRY	300	Government	300, 600	P G ..	0800 to 2400	—	—	
Inhamitane ..	23° 58' 05" S. 32° 35' 39" E.	CRZ	300	Government	300, 600	P G ¹ ..	N	0.60	—	
Lourenço Marques ²	15° 01' 47" S. 40° 45' 06" E.	CRV	300	Government	300, 600	P G ..	N	0.60	—	
Mozambique ²	36° 52' 55" E. 17° 52' 03" S.	CRW	200	—	600, 900, 1,000	P G ..	0800 to 2400	0.60	—	
Quelimane ²			—	—	—	—	—	—	—	
Tete ²		—	—	—	—	—	—	—	—	
NETHERLANDS (See under HOLLAND)										
NETHERLAND INDIES (See under DUTCH EAST INDIES)										
NEW BRITAIN (See under NEW GUINEA)										
NEW CALEDONIA	Meridian of Greenwich. 166° 27' 32" E. 22° 16' 20" S.	FQN	Day 400	Government	300, 600	P G ¹ ..	Local Time. 1000 to 1100 1400 to 1500 1700 to 1800 2000 to 2400	0.20 ² 3 0.40 ⁴ 3 0.60 ⁵ 3	1.20 ² 3 2.40 ⁴ 3 3.60 ⁵ 3	¹ The station corresponds also with Brisbane Radio and with a station at l'ort Vila

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
NEWFOUNDLAND AND LABRADOR — <i>contd.</i>										
Domino ..	Meridian of Greenwich. Labrador 53° 28' 00" N. 55° 44' 00" W.	VOD	150	Marconi Co. of Canada	600	— ¹	0800 to 2000 ²	—	—	Francs.
Fogo ..	Fogo Island 54° 13' 00" W. 49° 42' 00" N.	VOJ	250	Marconi Co. of Canada	300, 600	—	0800 to 2000 ²	—	—	—
Gready ..	Labrador 53° 48' 00" N. 56° 23' 00" W.	VOE	150	Marconi Co. of Canada	600	— ¹	0800 to 2000 ²	—	—	—
Holton ..	Labrador 54° 35' 00" N. 57° 15' 00" W.	VOG	150	Marconi Co. of Canada	600	— ¹	0800 to 2000 ²	—	—	—
Mokkovik ..	Labrador 55° 13' 00" N. 59° 03' 00" W.	VOI	150	Marconi Co. of Canada	600	— ¹	0800 to 2000 ²	—	—	—
Rich Point ..	Newfoundland 50° 42' 00" N. 57° 24' 30" W.	VCH	—	Government ..	300, 600	—	—	—	—	—
St. John's ..	—	BZM	—	—	—	—	—	—	—	—
Smoky Tickle ..	Labrador 54° 26' 00" N. 57° 11' 00" W.	VOF	150	Marconi Co. of Canada	1,600, 4,200 600	— ¹	0800 to 2000 ²	—	—	—
Venison Island ..	55° 46' 00" W. 53° 14' 00" N.	VOB	100	Marconi Co. of Canada	600 *	— ¹	0800 to 2000 ²	0.60	—	—
NEW GUINEA (Late GERMAN NEW GUINEA)										
ADMIRALTY ISLAND	Meridian of Greenwich.									
Manus Radio ..	02° 01' 50" S. 147° 17' 00" E.	VZO	200	Australian Government	300, 600	P G	Mean time of the meridian 150° East of Greenwich. 0600 to 0700 0900 to 2000 1300 to 1400 1700 to 2000	0.30	0.60 ¹	¹ Station communicates with New Guinea, Australia, Vila, and New Hebrides ² When necessary, or when requested by vessels, the station transmits weather forecasts
HERMIT ISLANDS										
Maron ..	01° 33' 00" S. 145° 02' 00" E.	VHR	—	British Admiralty	—	—	—	—	—	—

[illegible]

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, France.		Remarks.
								Per Word.	Minimum Charge.	
NEW ZEALAND										
Auckland Radio	Meridian of Greenwich. 36° 50' 37" S. 174° 46' 08" E.	VLD	300	Government	300, 600	P G ..	Mean Time of New Zealand ¹ N	0.63 ^{2 4 7} 0.31 ^{5 3 4 7}	—	¹ For communication with fixed stations ² Rate applicable to radiotelegrams to or from vessels not registered in New Zealand or Australia or not trading exclusively between New Zealand and Australia or on the New Zealand coast
Awamui	Auckland; Mongonui 34° 54' 00" S. 173° 18' 00" E.	VLA	Day 300 Night 600	Government	300, 600 , 1,800, 2,000, 2,500	P G ..	0800 to 0100 ⁵	0.63 ^{4 7}	0.31 ^{3 4 7}	
Awarua	Otago, near Bluff Harbour 46° 30' 00" S. 168° 23' 00" E.	VLB	Day 300 Night 600	Government	300, 600 , 1,800, 2,500, 3,500	P G ..	1830 to 2400 ⁵	0.63 ^{2 4 7}	0.31 ^{3 4 7}	
Macquarie Island.	54° 31' 00" S. 158° 57' 00" E.	VIQ	—	Government	300, 450, 600	—	—	—	—	³ Rate applicable to radiotelegrams to or from vessels registered in New Zealand or Australia and those trading exclusively between New Zealand and Australia or on the New Zealand coast
Rarotonga	21° 12' 00" S. 159° 48' 30" W.	VMR	Night 500 Night 850	Government	300, 600 , 1,700	P G ..	1800 to 0200	0.63	—	⁴ For press radiotelegrams from ship stations, the coast station rate is 3 fr. 15 centimes per 100 words or fraction thereof
Wellington	41° 17' 05" S. 174° 46' 39" E.	VLW	300	Government	300, 600	P G ..	N	0.63 ^{2 4 7} 0.31 ^{5 3 4 7}	—	⁵ In addition a continuous listening service for distress signals is maintained ⁶ Meteorological radiotelegrams are sent free of charge at the following hours: Awarua Radio 0930, Wellington Radio 2100, Awamui Radio 2200 ⁷ Including the charge for transmission over the telegraph lines of New Zealand of radiotelegrams originated in or for delivery in New Zealand ⁸ Time signals are sent from this station. (See

NICARAGUA		Meridian of Greenwich.	NAZ	300	U.S. Navy ¹	600, 952, 975, 1,832	O ..	N	—	—	1 Accounts are settled by the U.S. Marine Corps
Managua ..	86° 17' 00" W. 12° 17' 00" N.										
NIGERIA		Meridian of Greenwich.	VPY	250	African Direct Cable Co.	300, 600	P G ..	Meridian of Greenwich.	0.60	—	
Lagos ..	06° 26' 35" N. 03° 23' 55" E.										
NORWAY (NORGE)		Meridian of Greenwich.	LGN	—	—	—	D F ..	Central European Time	—	—	
Bergen ° ..	60° 24' 30" N. 05° 22' 00" E.										
Bergen Radio ° ..	60° 24' 30" N. 05° 22' 00" E.		LGN	Day 270 Night 1,000	Government	300, 600	P G ..	N	0.40 ⁴	4.00 ⁴	1 Controlled by Gothenburg. Bearings sent free 2 During the months from May to September 3 During the months from October to April 4 This charge is reduced 50 per cent. for meteorological radiotelegrams 5 The accounts are settled by the Telegraph Administration of Norway, Christiania 6 The Norwegian D.F. stations are not yet officially working
Christiania ..	59° 59' 00" N. 10° 41' 00" E.		LCH	—	—	4,100, 5,450, 8,100, 8,000 C.W. 600	—	—	—	—	
Flekkeroy Radio ..	58° 04' to 40" N. 08° 06' 2.33" E.		—	—	—		D F° ..	—	—	—	
Flekkeroy ° ..	near Christiansand 58° 04' 05" N. 07° 59' 00" E. 71° 04' 25" N. 24° 09' 20" E.		LDF	Day 100	Government	300, 600	P G ..	N	0.40 ⁴	4.00 ⁴	
Ingø ° ..	West of North Cape 71° 04' 25" N. 24° 09' 20" E.		—	—	—	—	D F ..	—	—	—	
Ingøy Radio ..	71° 04' 25" N. 24° 09' 20" E.		LEI	480	Government	300, 600	P G ..	N ² , 0800 to 2100 ³	0.40	4.00	
Ingøy Radio ° ..	71° 04' 25" N. 24° 09' 20" E.		LEI	480	Government	600, 1,600	D F ..	N	—	—	
Karljohansvern ..	71° 04' 25" N. 24° 09' 20" E.		LEZ	—	Government	—	O ..	—	—	—	
Røst Radio ° ..	Christiania Fiord 67° 30' 24" N. 12° 04' 45" E.		LFR	—	Government	600	D F ..	—	—	—	
Røst ..	67° 30' 24" N. 12° 04' 45" E.		LFR	35	Government	300, 600, 1,600	P G ..	0900 to 1300 1600 to 1930 Holidays : 0800 to 1000	0.40	4.00	
Sörvaagen ..	Lofoden Islands 67° 53' 30" N. 13° 02' 00" E.		LEN	35	Government	300, 600	P G ..	0900 to 1300 1600 to 1930 Holidays : 0800 to 1000	0.40	4.00	
Spitzberg ° ..	—		FLFG	—	—	—	D F ..	—	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres—the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
NORWAY—<i>contd.</i>										
Stavanger ..	Meridian of Greenwich.	LCM	—	—	12,000	—	—	Francs.	Francs.	
Tjømø Radio *	59° 04' 38.17" N. 10° 24' 36.16" E.	—	—	—	600	DF ..	—	—	—	
Tjømø Radio *	Christiania Fjord 59° 03' 05" N. 10° 24' 05" E.	LET	Day 160	Government ..	300, 600	PG ..	N	0.40 ⁴	4.00 ⁴	
Tryvandsbiden	—	LCH	—	Government ..	—	—	—	—	—	
Utsire Radio *	59° 18' 10" N. 04° 55' 08" E.	LGK	—	—	600	DF ..	—	—	—	
PACIFIC ISLANDS										
GILBERT AND ELLICE ISLANDS										
Fanning ..	Meridian of Greenwich. 03° 51' 23" N. 159° 21' 50" W.	VQN	Day 300 Night 500	F. R. Pelly ..	300, 600	PR ² ..	—	0.60	—	¹ 170° E. of Greenwich ² The station also exchanges official and public correspondence with Washington VOO ³ The station is available at these hours and until traffic is cleared, for working with ships
Ocean Island	00° 30' 00" S. 169° 20' 00" E.	VQK	1,000	Government of Colony	300, 600, 700, 1,650	PG ..	0930, 1530, 2015 ³	0.60	—	
CHATHAM ISLANDS										
Chatham Islands ..	43° 57' 00" S. 176° 57' 00" W.	VLC	300	Government ..	300, 600, 1,600	PG ..	1600 to 2400	0.63 0.31	—	
MARSHALL ISLANDS (JAPAN)										
Nauru Radio ¹ ..	Pleasant Island 00° 25' 24" S. 166° 57' 00" E.	VKT	2,000, 500	Australian Government	300, 450, 600, 1,800, 3,500	PG ..	N	0.60 ²	—	¹ This station is connected with the International Telegraph System by wireless through Woodlark Island and Townsville Radio ² For radiotelegrams to and from ships licensed by other administrations

MARSHALL ISLANDS	13° 27' 15" N. 144° 44' 42" E.	150	U.S. Navy	300, 600, 1,800 c.w.	PG ..	N	0.30 ²	—	¹ Operated by the United States Navy ² No charge is made for relaying messages
TONGA (FRIENDLY ISLANDS)	21° 08' 57.5" S. 175° 12' 06" W.	520	Government	0, 600, 1,200, 1,600	PG ¹ ..	1000 to 1500	0.60	—	¹ Meteorological information free on request.
PANAMA	Meridian of Greenwich.								
(a) PANAMA REPUBLIC									
Cape Mala ..	09° 27' 30" N. 79° 59' 30" W.	300	U.S. Navy ¹	600, 1,908	PG ..	N	0.30	—	¹ The station transmits time signals daily from 0455 to 0500 and 1255 to 1300 (standard time of the meridian 75° W. of Greenwich) on a wavelength of 10,110 metres (spark)
La Palma ² ..	08° 26' 00" N. 78° 08' 30" W.	300	U.S. Navy	600, 1,815	PG ..	0500 to 1000 1200 to 1500 1700 to 2000 0600 to 0800 1200 to 1400 1800 to 2000	0.30	—	² Accounts settled by the owner
Puerto Obaldia ..	09° 33' 06" N. 79° 13' 06" W.	30	U.S. Navy	600, 1,988	PG ..		0.30	—	³ The station only communicates with fixed stations
(b) PANAMA CANAL ZONE	Pacific entrance of the Panama Canal	300 3,000	U.S. Navy	600, 975, 2,250, 2,400, 3,950, 9,800, 10,110, ¹ 10,510, 17,145	PG ³ ..	N	0.30	—	
Balboa ² ..	09° 07' 15" N. 79° 46' 20" W.	—	Government	300, 600, 1,800, 2,400	—	—	—	—	
Balboa ..	09° 07' 15" N. 79° 46' 20" W.	—	Government	507, 2,750 c.w.	O ..	N	—	—	
Coco Solo ² ..	09° 23' 10" N. 79° 53' 11" W.	200	U.S. Navy	300, 600, 1,500, 1,800	PG ..	—	—	—	
Colon ..	09° 21' 56" N. 79° 54' 01" W.	—	Government	300, 600, 1,500, 1,800	PG ..	—	—	—	
Colon ..	—	—	—	1,620	DF ..	—	—	—	
PARAGUAY									
Asuncion ..	—	—	—	1,000	—	—	—	—	
Concepcion ..	—	—	—	1,000	—	—	—	—	
Encarnacion ..	—	—	—	1,000	—	—	—	—	
Esteros ..	—	—	—	600, 900	—	—	—	—	
PERSIAN GULF	On the Pilonago								
Aden Radio BZF ..	23° 52' 00" S. 61° 20' 00" W.	500	British Admiralty	600 ¹ , 2,000 ²	PR ³ ..	Mean Time of Aden ⁴ N ⁴	0.60	—	¹ Other wavelengths are used for official correspondence only
Aden Radio VPI ..	Meridian of Greenwich. 12° 50' 00" N. 45° 00' 00" E. Elephant's Back	250	Government	600	PG ..	N	0.60	—	² Communicates also with Bushire
Bahrein ..	12° 46' 00" N. 45° 03' 00" E. Bahrein	350	Indo-European Telegraph Dept.	300, 600	PG ³ ..	0430 to 1330 ⁴	0.60	—	³ The station sends out a weather bulletin at 0130 and 1330 (G.M.T.) on a

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
PERSIAN GULF										
<i>—contd.</i>										
Bushire ..	Persia 28° 54' 36" N. 50° 49' 43" E.	VTB	350	Indo-European Telegraph Dept.	300, 600	P G ..	N	0.60	—	wavelength of 2,000 metres, referring to the meteorological conditions in the eastern portion of the Arabian Sea, the message being prefixed by the words "East Arabian Sea."
Henjam ..	Persia 26° 41' 14" N. 55° 53' 25.5" E.	VTH	300	Indo-European Telegraph Dept.	300, 600	P G ..	N	0.60	—	
Jask ..	Persia 25° 38' 12" N. 57° 45' 40" E.	VTJ	—	Government ..	300, 600	—	—	—	—	
Lingeh ..	Persia 26° 33' 34" N. 54° 53' 23" E.	VTL	300	Indo-European Telegraph Dept.	300, 600	P G ..	0415 to 1415	0.60	—	⁴ The periods during which the station is not engaged in official work are not specified. If a ship is unable to gain the attention of the station after calling twice in the usual way, the call should not normally be repeated until an interval of an hour has elapsed.
Perim ..	Straits of Babel Mandeb	BVQ	—	British Admiralty	—	O ..	—	—	—	⁵ Three hours in advance of Greenwich time
PERU										
<i>Meridian of Greenwich</i>										
Cachendo ..	71° 51' 10" W. 16° 56' 10" S.	OAB	540	Government ..	600, 1,500	P G ..	0800 to 2400	0.30	—	¹ The station is open five minutes before and after every hour
Callao ..	77° 08' 53" W. 12° 03' 53" S.	CLG	160	Government ..	600	P G ..	0800 to 2200 Sundays and Holidays : 0800 to 1200	0.30	—	² Approximately ³ Interior station ⁴ Under construction ⁵ Receiving station only ⁶ Fixed stations only ⁷ The accounts are settled by the Servicio Radiotelegrafico del Peru, Lima
Chala ..	15° 40' 20" S. 74° 18' 34" W.	C	—	Government ..	600, 760	—	—	—	—	
Chala ..	74° 14' 06" W. 15° 51' 25" S.	OAC	220	Government ..	600	P G ..	0800 to 1800 Sundays and Holidays : 0800 to 1200 0700 to 2300 Sundays and Holidays : 0700 to 1200	0.30	—	
Eten ..	79° 53' 06" W. 06° 55' 29" S.	OAG	220	Government ..	600, 3,500	P G ..	—	0.30	—	

Ilo ..	OAL	220	Government	600	P G	0830 to 1730 Sundays and Holidays :	0.30
Ilo ..	L	—	Government	600, 750	—	—	—
Frontón	OAF	16	Government	600	O	— 1	—
Iquitos ³	OAY	810	Government	1,500, 4,000	— 6	2300 to 1200	—
Leticia	OAQ	220	Government	2,000	— 6	0630 to 1200	—
Lima (San Cristobal)	OAZ	810	Government	600, 1,500, 3,500, 4,000	— 6	N	—
Masisea ³	OAM	220	Government	2,000	— 6	0630 to 1200	—
Orellana ³	OAO	220	Government	2,000	— 6	0630 to 1200	—
Pisco ..	P	—	Government	600	—	—	—
Pisco ..	OAP	160	Government	600	P G	0800 to 2300 Sundays and Holidays :	0.30
Puerto Bermudez ..	OAE	220	Government	2,000	— 6	0800 to 2300 Sundays and Holidays :	—
Puerto Maldonado ..	OAD	—	— 6	—	— 6	0800 to 1200 0630 to 1200	—
San Cristobál	Z	—	Government	600, 1,500, 2,000, 3,000, 3,500, 4,000	—	0900 to 2300	—
Trujillo ?	OAT	220	Government	600, 1,500	P G	0500 to 2300 Sundays and Holidays :	0.30
<p>¹ Mean time of the meridian 120° E. of Greenwich</p> <p>² Stations have been dismantled for re-erecting on other sites</p> <p>³ The station sends time signals daily from 1055 to 1100 and 2155 to 2200 (standard time of the meridian 120° E. of Greenwich) on wavelengths of 5,200 metres (arc) and 2,700 metres (spark)</p> <p>⁴ Approximately</p>							
PHILIPPINE ISLANDS							
Amuguis ² ..	KPB	300	Government	600, 1,200	P G	Mean Time of the Islands ¹ 0800 to 1530	0.60
Balabac ..	KEW	—	Philippine Insular Government	—	—	—	—
Batangas ..	KPC	—	Philippine Insular Government	2,700	P G	0700 to 2000	0.60
Bongao ..	KEO	—	Philippine Insular Government	600, 952	P G	0800 to 1200 1400 to 1730 Sundays and holidays :	—
Cagayan de Sulu ..	KEV	—	Philippine Insular Government	750	P G	0800 to 1200 1400 to 1730 Sundays and holidays :	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
PHILIPPINE ISLANDS—contd.										
Camp John Hay ..	Meridian of Greenwich.	WUBC	—	U.S. Army ..	—	O ..	X	—	—	
Camp Stotesenburg ..	—	WUCA	—	U.S. Signal Corps	—	—	—	—	—	
Cavite	14° 28' 55" N. 120° 55' 00" E.	NPO	300, 5,000	U.S. Navy ..	c.w. 600, 5,000	P G ^s ..	N	0.30	—	
Cebu	Cebu Islands 10° 18' 00" N. 123° 50' 00" E.	KPI	500	Philippine Insular Government	600, 1,200	P G ..	0700 to 2000	0.60	—	
Culion	Culion Island 11° 50' 00" N. 120° 02' 00" E.	KPJ	200	Philippine Insular Government	600, 1,200	P G ..	0800 to 1730	0.60	—	
Cuyo	10° 30' 00" N. 121° 00' 00" E.	KIX	150	Government ..	600, 1,200	P G ..	0800 to 1200 1400 to 1730 Sundays and holidays :	0.60	—	
Davao	Mindanao Island 7° 00' 00" N. 125° 30' 00" E.	KIF	200	Philippine Insular Government	600, 1,200	P G ..	0800 to 1200 1400 to 1730 Sundays and holidays :	0.60	—	
Fort Drum	Manila Bay, El Fraile Island 14° 18' 23" N. 120° 37' 43" E.	WUAL	30	U.S. Army ..	430	O ..	—	—	—	
Fort Frank	Manila Bay, Carabao Island 14° 16' 20" N. 120° 36' 45" E.	WVL	50	U.S. Army ..	—	O ..	—	—	—	
Fort Mills	Corregidor Island 14° 22' 52" N. 120° 34' 40" E.	WVN	500	U.S. Army ..	300, 600	O ..	N	—	—	
Fort Wint	Grande Island 14° 46' 15" N. 120° 13' 25" E.	WUAK	125	U.S. Army ..	1,200	O ..	X	—	—	
Iloilo	Panay 10° 40' 00" N. 122° 30' 00" E.	KPM	500	Philippine Insular Government	600, 1,200	P G ..	0700 to 2000 Sundays and holidays : 0700 to 1900	0.60	—	

Isabela de Basilan ..	06° 40' 00" N. 121° 50' 50" E.	KPN	20	Government ..	200	P G ..	0800 to 1730 1400 to 1730 Sundays and holidays :	0.60	—
Jolo ..	Jolo Island 06° 10' 00" N. 121° 00' 00" E.	KIL	200	Philippine Insular Government	600	P G ..	0800 to 1000 1600 to 1730 0800 to 1730 Sundays and holidays :	0.60	—
Lebak ..	124° 05' 00" E. 06° 35' 00" N.	KPX	—	Philippine Insular Government	600, 932, 1,200	P G ..	0800 to 1000 1600 to 1730 0800 to 1200 1400 to 1730 Sundays and holidays :	—	—
Malabang ..	Mindanao Island 07° 00' 00" N. 124° 05' 00" E.	KIZ	200	Philippine Insular Government	600, 1,200	P G ..	0800 to 1000 1600 to 1730 0800 to 1200 1400 to 1700 Sundays and holidays :	—	—
Malabang ..	—	PKX	—	—	1,800, 2,500, 3,500, 4,000, 6,000, 8,800, 18,000	—	0800 to 1000 1600 to 1730	—	—
Malangas ..	07° 42' 00" N. 123° 05' 00" E.	KPV	300	Philippine Insular Government	300, 600	P G ..	0700 to 2000	0.60	—
Malita ..	Davao 06° 22' 00" N. 123° 36' 00" E.	KPW	200	Government ..	600, 1,200	P G ..	0800 to 1200 1400 to 1730 Sundays and holidays :	0.60	—
Manila ..	Luzon 14° 35' 48" N. 120° 58' 47" E.	WUAJ	200	U.S. Army	600	O ..	0800 to 1000 1600 to 1730 X	—	—
Mati ..	126° 17' 00" E. 06° 57' 00" N.	KPZ	—	Philippine Insular Government	600, 932	P G ..	0800 to 1200 1400 to 1730 Sundays and holidays :	—	—
Olongapo ..	14° 49' 78" N. 120° 16' 49" E.	NPT	150	U.S. Navy	600	P G ..	0800 to 1000 1600 to 1730	0.30	—
Puerto Princesa ..	Paraguay 09° 44' 00" N. 118° 40' 00" E.	KIV	150	Government ..	600, 1,200	P G ..	0800 to 1200 1400 to 1730 Sundays and holidays :	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
PHILIPPINE ISLANDS—contd.										
San Francisco	Meridian of Greenwich. Camotes 10° 38' 00" N. 124° 22' 00" E.	KPY	150	Government	300, 600	P G	0800 to 1200 1400 to 1730 Sundays and holidays : 0800 to 1000 1600 to 1730 0800 to 1200 1400 to 1730 Sundays and holidays : 0800 to 1000 1600 to 1700 0800 to 1200 1400 to 1730 Sundays and holidays : 0800 to 1000 1600 to 1730 0700 to 2000 Sundays and holidays : 0700 to 1900	0.60	—	
San José	Mindoro 12° 20' 00" N. 121° 00' 00" E.	KIY	200	Philippine Insular Government	600	P G		0.60	—	
Siasi	120° 49' 15" E. 05° 32' 45" N.	KED	—	Philippine Insular Government	600	P G		—	—	
Zamboanga.	Mindanao Island 06° 55' 00" N. 122° 03' 00" E.	KIW	400	Philippine Insular Government	600, 1,800	P G		—	—	
POLAND										
Poznan (Posen)	Meridian of Greenwich 16° 56' 25" E. 52° 24' 30" N.	PSO ¹	1,000 1,100 1,300	—	800, 1,800, 5,600, 2,000, 4,700, 7,000, 10,000 1,600, 4,800 1,600 2,000	P G	N	—	—	
Posen	—	PSO	—	—	—	—	—	—	—	
Thorn	—	TOR	—	—	—	—	—	—	—	
Warsaw	—	WAR	—	—	—	—	—	—	—	
PORTO RICO										
Cayey	Meridian of Greenwich. 66° 00' 50" W. 18° 07' 10" N.	NZR	—	—	10,150	O	Meridian 75° West of Greenwich. N	—	—	
Ceiba..	18° 16' 00" N. 65° 39' 00" W.	WKK	150	Bureau of Insular Telegraphs	300, 600, 1,610	P G and P R	0800 to 1200 1300 to 1800 1900 to 2000	—	—	

¹ The station only uses provisionally the wavelength of 300 metres.
² The station only corresponds with fixed stations.
³ Western European time, October to March, 0800 to 1700; holidays, 0800 to 1300. April to September, 0800 to 1400, 1500 to 1900; holidays, 0800 to 1300.
⁴ The service is suspended through disorder.

Ensenada	WPR	400	South Porto Rico Sugar Co. Bureau of Insular Telegraphs	300, 600, 1,800	P G	0500 to 1200 1300 to 2200 0800 to 1200 1300 to 1800 1900 to 2000	0.20
Vieques	WGW	150		300, 600, 1,610	P G and P R		—
PORTUGAL							
Meridian of Greenwich.							
Corvo	PQC	65	Government	300, 600 ¹	— ²	— ³	—
Fayal..	CRA	130	Government	300, 600	P G	N	0.40
Flores	CRD	130	Government	300, 600 ¹	P G	N	0.40
Lisboa Radio	CRF	190	Government	300, 450, 600	P G	N	0.40
Lisbon	CTV	—	Navy	300, 450, 600	DF ¹	—	—
Lisbon	PQL	190	Government	300, 450, 600, 1,000	P G	0800 to 2000	0.40
Oporto ⁴	CRP	400	Government	300, 600	P G	N	0.40
Ponta Delgada	BWP	—	Admiralty	600	—	—	—
Sta Maria	CRB	65	Government	300, 600 ¹	P G	N	0.40
San Miguel	CRA	65	Government	300, 600	P G	N	0.40
Terceira Radio	PQT	400	Government	300, 600, 900 ² 1,000 ²	P G	N	0.40
CAPE VERDE ISLANDS							
Boa Vista Island ¹							
Port Grande	CRF	200		300, 600, 1,000	—	—	—
St. Thiago Island ¹ , (Santiago Island)				600, 1,000, 1,600, 6,000	—	—	—
Sal Island ¹				300, 600, 1,000	—	—	—
São Vicente Island ¹				600, 1,000, 1,200, 1,600, 3,000	—	—	—
PORTUGUESE EAST AFRICA. MOZAMBIQUE							
(See under BIQUE)							

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres — the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.	
								Per Word.	Minimum Charge.		
ROUMANIA											
Baneasa ..	Meridian of Greenwich.	BNS	—	Government ..	—	—	—	—	—	¹ Public correspondence limited to the ships Dacia, Durostor, Imperatul, Traian, Principesa Maria, Regele Carol I and Roumania ² During the voyages of the Roumanian ships	
Bucharest ..	—	BUC	—	—	7,500	—	—	—	—		
Constantza-Tunnel ..	44° 10' 32" N. 28° 39' 03" E.	CVS	240	State Maritime Service	600	PR ¹ ..	N ²	0.15	1.50		
Vaslui ..	—	VAS	—	—	3,000	—	—	—	—		
RUSSIA											
Bukhara ..	Meridian of Greenwich.	—	—	—	—	—	—	—	—	¹ Communicates with fixed stations only ² Approximately	
Moscow ..	—	MSK	—	—	5,000, 6,700	—	—	—	—		
Petrozavodsk ..	34° 23' 22" E. 61° 47' 18" N.	RDI	200	—	1,200	— ¹	N	—	—		
Staraja Bukhara ..	64° 25' 52" E. 39° 46' 37" N.	RDJ	200	—	800	— ¹	N	—	—		
FAR EASTERN REPUBLIC											
Nikolayevsk ..	53° 08' 19" N. 140° 42' 54" E.	RNL	—	Government ..	300, 600	—	—	—	—	¹ Communicates with fixed stations only ² Approximately	
Vladivostok ..	131° 48' 00" E. 43° 00' 00" N. ²	RAS	—	—	1,500, 3,950	O ..	N	—	—		
SIBERIA											
Anadir ..	64° 34' 00" N. 175° 35' 00" E.	RNR	—	Government ..	300, 420, 600	—	—	—	—		
Naiahansk ..	61° 33' 00" N. 159° 59' 00" E.	RNN	—	Government ..	300, 420, 600	—	—	—	—	¹ Communicates with fixed stations only ² Approximately	
Okhotsk ..	59° 22' 00" N. 143° 20' 00" E.	ROT	—	Government ..	300, 420, 600	—	—	—	—		
Petrovavlovsk ..	53° 00' 10" N. 158° 38' 45" E.	RPK	—	Government ..	300, 600	—	—	—	—		
Sredne-Kolymsk ..	157° 09' 50" E. 67° 10' 14" N.	RDG	800	—	2,000	— ¹	N	—	—		
UKRAINE											
Odessa RDE..	Ukraine 30° 46' 00" E. 46° 29' 00" N.	RDE	350	Willis-Boas ..	600	P G ..	N	—	—	¹ Communicates with fixed stations only ² Approximately	
Odessa Observatory	Ukraine 30° 43' 53" E. 46° 28' 37" N.	RDH	250	—	1,200	— ¹	N	—	—		

SAINT HELENA									
St. Helena	15° 58' 00" S. 05° 45' 00" W.	BXH	—	Government ..	—	P G ..	—	0.60	—
SAINT LUCIA (See under BRITISH WEST INDIES)									
SAINT PIERRE and MIQUELON ISLANDS									
Galantry ¹	Meridian of Greenwich. S. Pierre Island. 46° 46' 00" N. 56° 10' 00" W.	FIT	50	Government ..	600	P G ⁴ 1 ..	Local Time of S. Pierre ³ 0800 to 1900	0.40	4.00
Miquelon	Miquelon Island. 47° 07' 00" N. 56° 24' 00" W.	FIQ	Day 80	Government ..	600	— ^{2 6}	0800 to 1100 1500 to 1700	—	—
SAMOA ISLANDS (SAMOA ISLANDS)									
Apia Radio	Meridian of Greenwich. 13° 51' 00" S. 171° 48' 00" W.	VMG	500	New Zealand Gov- ernment	600 ¹	P G ³ ..	0730	0.63 ²	—
Tutuila	14° 16' 30" S. ⁸ 170° 42' 00" W.	NPU	300, 2,300	U.S. Navy ..	600, 750	P G ..	N	0.30	—
SARAWAK (See under BRITISH NORTH BORNEO)									
SERBS, CROATS and SLOVENS—KINGDOM OF (YUGO SLAVIA)									
Belgrade	Meridian of Greenwich. 44° 47' 57" N. 20° 31' 57.5" E.	HFB	—	—	6,000 to 7,000	— ^{1 2}	N	—	—
Herzegovina ..	18° 32' 14" E. 42° 27' 00" N.	UNK	400	—	800, 1,800	— ³	—	—	—
Sarajevo	43° 57' 00" N. 18° 26' 00" E.	HFC	—	—	2,600 to 6,000, 600 to 2,800	— ¹	X	—	—
Sebenico	15° 54' 12" E. 43° 43' 30" N.	UNS	265	—	600, 1,200	— ³	—	—	—
Skopje	41° 25' 30" E. 42° 00' 18" N.	HFS	—	—	2,500, 4,000	— ¹	X	—	—

¹ The station also communicates with Miquelon.
² This station only communicates with Galantry.
³ Four hours behind French Legal Time.
⁴ This station is also equipped with an emergency installation.
⁵ This station communicates with fixed stations only.

¹ The station is connected to the International Telegraph System by wireless through Awani Radio, New Zealand (normal route) or Suva, Fiji Islands (alternative route).
² The relaying rate is 0.63 per word.
³ Local weather bulletin preceded by the letter I are broadcasted by the station at 0230, 1630, 2230 (standard time of the meridian 75° west of Greenwich).

¹ Communicates only with fixed stations.
² Sends meteorological message at 1345 hours daily (G.M.T.).
³ Provisionally, military station.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
SEYCHELLES										
Seychelles	—	BZH	—	—	2,000, 4,700, 5,300	—	—	—	—	
SIAM										
Bali	Meridian of Greenwich.	HGC	—	—	300, 600	— ³	N	—	—	¹ The station is open for official correspondence. However, it accepts messages concerning the movements and security of ships exchanged between the captain of the ships and their owners or agents. ² The accounts are settled by the General Direction of Posts and Telegraphs, Bangkok. ³ Official correspondence only.
Bangkok ²	13° 44' 30" N. 100° 32' 00" E.	HGA	300	Government	300, 600, 1,600, 1,800	PG ¹ ..	—	0.40	4.00	
Makut Rajakumara Murutha	—	HGH	—	—	300, 600	— ³	N	—	—	
Phra Ruang	—	HGG	—	—	300, 600	— ³	N	—	—	
Red Light Ship I. ..	Mouth of the Menam Chao Praya	HGX	—	—	300, 600	— ³	N	—	—	
		HGR	50	—	600	PG ..	7th time belt east of the Greenwich belt. 0000 to 0030 0300 to 0330 0500 to 0630 0900 to 0930 1200 to 1230 1500 to 1530 1800 to 1830 2100 to 2130	0.40	4.00	
Songgora (Songkhla)	Gulf of Siam, Malay Peninsula 07° 12' 00" N. 100° 38' 00" E.	HGB	300	Government	300, 600, 1,600, 1,800	PG ¹ ..	—	0.40	4.00	
Sua Kamrensinthu ..	—	HGE	—	—	300, 600	— ³	N	—	—	
Sua Tayanchol ..	—	HGD	—	—	300, 600	— ³	N	—	—	
Sugrib	—	HGF	—	—	300, 600	— ³	N	—	—	
Suriya Monthon ..	—	HGF	—	—	300, 600	— ³	N	—	—	
Vidnet Kichkara ..	—	HGS	—	—	300, 600	— ³	N	—	—	
	—	HGT	—	—	300, 600	— ³	N	—	—	
SIBERIA (See under RUSSIA)										
SIERRA LEONE	Meridian of Greenwich, 08° 29' 48" N. 13° 13' 55" W.	VPU	250	African Direct Telegraph Co., Ltd.	300, 600	PG ..	Meridian of Greenwich, 0700 to 2100 Sundays: 0800 to 1000 1000 to 1300	0.60	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
SPAIN—contd.										
Cabo Finisterre Lighthouse	42° 52' 55" N. 09° 16' 18" W.	EAF	30	—	1,000	D F (Fog Signals) ¹⁰ P G ..	—	—	—	minimum charge is not applicable to these messages destined to the island
Cabo Mayor	Santander 43° 30' 00" N. 03° 48' 30" W.	EAS	108	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800	P G ..	N	0.45	4.50	
C. Palos	Murcia 37° 38' 00" N. 06° 40' 00" W.	EAP	202	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800	P G ..	N	0.45	4.50	The station only corresponds with military aircraft
Cabo, Villano Lighthouse	43° 09' 41" N. 09° 12' 48" W.	—	30	—	1,000	D F (Fog Signals) ¹⁰ P G ..	—	—	—	⁹ Fixed stations only consist of a group of sounds on a note tuned to 600 vibrations per sec. every 30 seconds, thus :— Sound Silence 1 sec. 7 secs. 1 sec. 21 secs. 10 The wireless fog signals consist of a note tuned to 500 vibrations per second of half second duration every 7½ seconds, thus :— Sound, 1 sec. 7 secs. making in all eight emissions per minute
Cadiz	36° 31' 30" N. 36° 17' 42" W.	—	6	—	70	P G ..	—	—	—	
Cadiz	36° 29' 45" N. 06° 16' 14" W.	EAC	860	Compania Nacional de Telegrafia sin Hilos	2,500	P G ..	N	0.45	4.50	
Carraca (La)	Gulf of Cadiz 36° 29' 30" N. 06° 10' 50" W.	CLZ	60	Navy ..	300, 450, 600 ¹ 1,200	O ..	N	—	—	
Cartagena	37° 35' 36" N. 06° 59' 18" W.	EBX	210	Navy ..	600, 900, 1,000, 1,200, 1,600	O ..	N	—	—	
Ceuta..	Morocco 32° 16' 24" W. 32° 48' 40" N.	EGD	320	Army ..	600, 1,200, 1,500, 2,100	O ..	N	—	—	
Coruna ²	43° 24' 29" N. 08° 24' 13" W.	EGJ	430	Army ..	600, 1,200, 1,600	O ..	N	—	—	
Cuatro Vientos	40° 46' 27" W. 40° 22' 30" N.	ECLA	300	Army ..	600, 900, 1,200, 1,500	— ⁷	—	—	—	
Ferrol (Le) ²	43° 28' 52" N. 08° 14' 05" W.	EBW	440	Navy ..	600, 900, 1,200, 1,600, 1,800	O ..	N	—	—	
Getate	03° 43' 24" W. 40° 18' 15" N.	ECLC	25	Army ..	600, 700, 800	—	—	—	—	
Guadalajara	40° 37' 54" N. 03° 10' 09" W.	EGZ	54	Army ..	900	— ⁸	X	—	—	
Hapsalu	—	EPU	—	—	900	—	—	—	—	
Kekebia	—	ZNR	—	—	900	—	—	—	—	
Kerenik	—	KBR	—	—	900	—	—	—	—	
Madrid, E.B.Z.	40° 25' 00" N. 03° 43' 00" W.	EBZ	15	Navy ..	225, 300	— ⁸	N	—	—	

Madrid-Dirección Aeronáutica Militar (Military Aircraft Direction Findings) Madrid, EGC	03° 41' 18" W. 40° 25' 30" N.	25	ECLB	Army	..	600, 700, 800	— [?]	—	—	—
Mahón, CLM	40° 24' 30" N. 03° 50' 30" W.	540	EGC	Army	..	600, 900, 1,600, 2,000, 2,500, 3,750	O	—	—	—
Mahón, EGI	Minorca 04° 22' 38" E. 39° 31' 37" N.	300	CLM	Navy	..	600, 900, 1,800	O	—	—	—
Málaga	Minorca 39° 52' 29" N. 04° 22' 99" E.	320	EGI	Army	..	600, 1,200, 1,600	O	N	—	—
Matagorda	04° 23' 37" W. 36° 42' 51" N.	90	EGM	Army	..	600, 900, 1,200	O	—	—	—
Melilla	Gulf of Cadiz 36° 31' 30" N. 06° 14' 34" W.	6	—	—	—	70	P ^a	—	—	—
Palmas (Las)	06° 31' 30" N. 35° 18' 15" N.	320	EGB	Army	..	600, 1,200, 1,600, 2,100	O	N	—	—
Seville	02° 36' 25" W. 35° 22' 00" W.	860	EAL	Compania Nacional de Telegrafía sin Hilos	..	300, 800, 2,100, 2,540	P G	N	0.45	4.50
Soller Radio	06° 00' 47" W. 37° 21' 50" N.	300	ECLB	Army	..	600, 900, 1,200, 1,500	— [?]	—	—	—
S. Fernando, Tenerite	Majorca 39° 45' 15" N. 02° 45' 40" E.	270	EAO	Compania Nacional de Telegrafía sin Hilos	..	300, 800	P G	N	0.45	4.50
Valencia ²	Cadiz 28° 28' 30" N. 16° 15' 00" W.	—	EBV EAT	Compania Nacional de Telegrafía sin Hilos	..	2,100 300, 800, 2,100, 2,540	O P G	N N	— 0.45	— 4.50
Vigo ⁴	39° 27' 10" N. 00° 22' 16" W.	320	EGG	Army	..	600, 1,200, 1,600	O	N	—	—
(b) Colonies	43° 15' 00" N. 08° 40' 00" W.	430	EAV	Compania Nacional de Telegrafía sin Hilos	..	300, 600, 2,900	P G	N	0.45	4.50
Cabo Juby	Morocco 13° 06' 30" W. 27° 56' 00" N.	170	EGL	Army	..	600, 900, 1,200, 2,100	O	—	—	—
Larache	Morocco 35° 12' 00" N. 06° 12' 00" W.	220	EGF	Army	..	600, 900,	O	N	—	—
Tetuán	Morocco 08° 25' 30" W. 33° 33' 30" N.	350	EGK	Army	..	600, 900, 1,200, 1,500	O	—	—	—
Santa Isabel de Fer- nando Po ¹	Territory in the Gulf of New Guinea 03° 46' 00" N. 08° 48' 40" E.	130	EAY	Government (Foreign Office)	..	300, 600, 1,800	P G ²	0600 to 0900 1900 to 2200	0.55 ⁶	5.50 ⁶

Land Stations—Continued

Name	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks
								Per Word.	Minimum Charge.	
SPITSBERGEN (SVALBARD)										
Spitsbergen ..	Meridian of Greenwich. Green Harbour 78° 02' 26" N. 14° 14' 27" E.	LFG	400	Norwegian Government	300, 600, 1,600	P G ..	Central European Time. N ¹ 0800 to 2100 ²	0.40	4.00	¹ From June 15th to September 30th ² From October 1st to June 14th
Spitsbergen ..	78° 02' 26" N. 14° 14' 27" E.	LFG	—	—	—	D F ..	—	—	—	
STRAITS SETTLEMENTS										
Penang Radio ..	Meridian of Greenwich. 05° 32' 03.12" N. 100° 22' 51.14" E.	VPX	Day 350. Night 700	Straits Settlements Government	600	P G ..	N	0.60	—	
Selangor ..	Singapore 01° 20' 00" N. 103° 53' 00" E.	BXW	—	—	2,000, 5,000	O ..	—	—	—	
Singapore Radio ..	01° 20' 22.55" N. 103° 53' 24.75" E.	VPW	Day 350. Night 700	Straits Settlements Government	600, 1,800	P G ..	0600 to 2400 Sundays 0800 to 1000 1430 to 1630 2000 to 2200	0.60	—	
COCOS-KEELING ISLANDS										
Cocos ..	Meridian of Greenwich. Indian Ocean 12° 05' 24" S. 96° 53' 20" E.	VPK	150	Marconi International Marine Co. Eastern Extension Australasia and China Telegraph Co.	300, 600	P G ..	N	0.60	—	
SUDAN (ANGLO-EGYPTIAN)										
Akobo ..	—	AKR	100	Government ..	700	—	Fridays and Holidays : 0900 to 2300	—	—	¹ In the case of messages originating at, or intended for Port Sudan, the local landline charge is included in the coast tax
Atbara ..	17° 41' 15" N. 33° 58' 43" E.	ATR	150	Sudan Government	600, 700	P G ..	—	—	—	

El Fasher	..	13° 37' 33" N. 25° 21' 11" E.	FSR	200-250	Sudan ment	Government	900	P G	Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100 Fridays and holidays : 0900 to 1100 Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100	—
Geneina	..	—	GNR	200-250	Government	..	900	—	—	—
Khartoum	KMR	15° 36' 32" N. 32° 31' 03" E.	KMR	250-300	Sudan ment	Government	700	—	—	—
Khartoum	..	15° 36' 32" N. 32° 31' 03" E.	SUL	1,500	—	—	1,500 c.w.	—	—	—
Malakal	..	09° 35' 00" N. 31° 39' 00" E.	MIR	250-300	Sudan ment	Government	700	P G	Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100	—
Mongalla	..	05° 11' 34" N. 31° 45' 56" E.	MGR	250-300	Sudan ment	Government	700	P G	Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100	—
Nasser	..	08° 35' 30" N. 33° 03' 30" E.	NSR	250-300	Sudan ment	Government	700	P G	Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100	—
Nyala	..	—	NVR	200-250	Government	..	900	—	—	—
Port Sudan Radio	..	10° 37' 02" N. 32° 10' 55" E.	SUD	250-300	Sudan ment	Government	300, 600	P G	060 ¹	—
Wau	..	06° 41' 58" N. 28° 00' 36" E.	WWR	250-300	Sudan ment	Government	700	P G	Weekdays : 0600 to 1300 Fridays and holidays : 0900 to 1100	—
SWEDEN										
Boden Radio ¹²	..	Meridian of Greenwich. 65° 51' 46" N. 21° 39' 50" E.	SAI	200	State Telegraphs	..	300, 600, 2,700	P G	N ³	4.00
Göteborg Radio ¹²	..	57° 40' 44" N. 11° 54' 00" E.	SAB	350	State Telegraphs	..	300, 600, 1,800	P G ⁹	N	4.00
Gottland Radio ¹²	..	60° 44' 47" N. 14° 35' 50" E.	SAE	420	Marine Department	..	300, 600, 2,000	P G ¹¹	N	4.00
Grundkallen Bateau- phare	..	66° 20' 50" N. 18° 54' 30" E.	SAK	55	—	..	300, 450, 600	Special ⁶	X	— ⁷
Hällö	..	60° 44' 17" N. 18° 07' 47" E.	SAH	350	State Telegraphs	..	300, 600, 2,000	D F	—	—
Härnösand Radio ¹²	..	64° 31' 44" E. 58° 32' 18" N.	SAJ	—	—	..	2,500, 2,800, 4,000, 4,200 (c.w.); 3,300, 3,800, 4,200	P G ^{8 11}	N ¹	4.00
Karlsborg Radio	..	—	—	—	—	—	—	—	—	—

¹ The station is closed when, by reason of ice navigation is suspended in the Gulf of Bothnia.
² The station is intended for the transmission to the Karlskrona radio coast station of telegrams received by means of flag signals from ships passing within sight, or the re-transmission by means of these signals, to such ships, of telegrams sent to it through the Karlskrona radio coast station.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Type).	Nature of Service.	Hours of Service.	Coast Charge Franes.		Remarks.
								Per Word.	Minimum Charge.	
SWEDEN—contd. Karlskrona Radio ¹² Olandsreya (Bateau-phare)	Meridian of Greenwich. 55° 09' 00" N. 15° 35' 23" E. Near the extreme south of Oland	SAA	420	Marine Dept.	300, 600, 2,000, 6,000, 300, 450, 600	P G ¹¹ ..	N	0.40	4.00	³ Telegrams originating, on, or intended for ships and forwarded through Karlskrona Radio, are subject to the coast charge of Karlskrona Radio, the charge transmission over the inland telegraph lines, and a fixed charge of fr. 1 per radiotelegram. If exceptionally a telegram intended for a ship at sea is transmitted by radiotelegraphy to that ship by the lightskip, no charge will be credited to the ship station.
		SAG	55	—	—	— ²	X	— ³	— ³	
Trällebör Radio ¹² Vaxholm Radio ¹² .. Vinga ⁹ ..	56° 07' 00" N. 16° 34' 00" E. 55° 22' 13" N. 13° 09' 46" E. 59° 24' 15" N. 18° 21' 50" E. 57° 38' 00" N. 11° 36' 10" E.	SAC	250	State Railways	300, 375, 600	P R, ⁴ O ⁵	N	0.40	4.00	⁴ Public correspondence with the ferry boats of the Sassnitz-Trällebör line with the Sassnitz and with the ferry boats of the Sassnitz-Trällebör Railway line, concerning the railway traffic.
		SAF SAL	350 —	State Telegraphs —	300, 600, 1,800 600	P G ¹¹ .. D F ..	N —	0.40 —	4.00 —	

⁵ Official correspondence with the Sassnitz and with the ferry boats of the Sassnitz-Trällebör Railway line, concerning the railway traffic.

⁶ The station is intended for the transmission to the Håmösand Radio coast station of telegrams received by means of flag signals from ships passing within sight, or the retransmission by means of the signals to such ships of telegrams sent to it through the Håmösand Radio coast station.

⁷ Telegrams originating on, or intended for, ships,

and forwarded through Hårnösand. Radio, are subject to the coast charge of Hårnösand Radio, the charge of transmission over the inland telegraph lines, and a fixed charge of fr. 1 per telegram. If exceptionally, a telegram intended for a ship at sea is transmitted by radio-telegraphy to the ship by the lighthouse no charge will be credited to the ship station.

* When necessary gale warnings, and notices of other dangers to navigation, are transmitted on 600 metres (damped waves) for Skagerrak and Kattegat; by Göteborg Radio station at 1700 and 2200 (G.M.T.); for Baltic Sea (southern and northern); by Vaxholm Radio station at 1650 and 2150 (G.M.T.) for the Gulf of Bothnia by Hårnösand Radio station at 1635 and 2155 (G.M.T.). These warnings are given in plain English, and are preceded by the safety signal ——— (T T)

* Controlled by Göteborg W/T station (SAB).

¹⁰ Controlled by Gothenburg (SAB) on 600 metres wavelength

¹¹ The station furnishes to ships, on request, information relating to the presence of ice and to other matters affecting navigation, as well as to meteorological conditions. The charge for this information is 6 fr. 25 centimes when the station can furnish it without enquiry by telegraph or by telephone involving expense. Otherwise the charge is 9 fr. 37.5 centimes

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs. Per Word.	Remarks.
SWEDEN—contd.									
SWITZERLAND									
Berne ..	Meridian of Greenwich. 47° 00' 52" N. 07° 26' 37" E.	HBB	—	Federal Dept. of Posts and Telegraphs	3,400 c.w.	P G ..	0730 to 2200	—	¹² The accounts are settled by the General Direction of Telegraphs of Sweden, Stockholm
Lausanne ..	—	—	—	—	900, 1400, 2610 ^b	—	—	—	¹³ See International Time section of book ¹⁴ Communicates with fixed stations only
TARGANYIKA TERRITORY									
Dar es Salaam ..	Meridian of Greenwich. 06° 50' 30" S. 39° 17' 27" E.	KAC	—	Government	300, 600, 1,800, 2,500	—	—	—	
TIMOR (PORTUGUESE)									
Dilli ² ..	Meridian of Greenwich. 125° 35' 40" E. 09° 32' 00" S.	CRE	500	—	200, 600	P G ..	Mean time of the Island of Java ¹ Weekdays and holidays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.60	¹ 109° 48' 37' 05" East of Greenwich ² Accounts settled by the Direction of Posts and Telegraphs of the Province of Timor, Dilli
TONGA ISLANDS (See under PACIFIC ISLANDS)									
TRIPOLITANA AND CYRENAICA (ITALIAN LIBYA)									
Tripoli Radio ..	Meridian of Greenwich. 32° 52' 40" N. 13° 11' 40" E.	ICK	160 300	Government	300, 600	P G ¹ ..	N	0.60	¹ The station communicates only with fixed stations
CYRENAICA ..	Meridian of Greenwich. 32° 06' 14" N. 20° 03' 15" E.	ICJ	300 160-300	Government	2,400, 300, 600 c.w.	P G ..	0000 to 0200 0800 to 0900 1000 to 1100 1700 to 1830 2030 to 2200	0.60	² The station listens out for ships at sea during the first five minutes of each half-hour from 0600 to 2000 (G.M.T.)
Benghazi Radio ..									¹ The station also per-

Cirene Radio	..	21° 48' 00" E. 32° 48' 40" N.	IDN	—	Italian ment	600	— ¹	0330 to 0800 0900 to 1000 1200 to 1400 1500 to 1700 1945 to 2030 2230 to 2400 0200 to 0330 1100 to 1200 1400 to 1500 1830 to 1945 ²	—	forms a restricted military service
Derna Radio	..	32° 44' 54" N. 22° 39' 46" E.	ICO	270	Government	300, 600	P G	0.60	—	
Tobruk Radio	..	32° 03' 30" N. 24° 00' 00" E.	ICU	270	Government	300, 600	P G	0.60	—	
TUNISIA (AFRIKIYA)		Meridian of Greenwich.								
Ben-Négro-Gonio ³	..	37° 15' 00" N. 09° 53' 30" E.	FUA ³	—	French Navy	450	D F ⁴	N	—	¹ One hour in advance of Greenwich time
Bizerta	..	37° 14' 42" N. 09° 50' 03" E. ⁵	FEQ	—	—	450, 600	D F	—	—	² The coast charge is reduced to 15 centimes per word for correspond- ence with ships engaged in a regular service be- tween France, Corsica, Algeria and Tunis
Bizerta	..	Sidi-Abdallah 37° 09' 38" N. 09° 48' 18" E.	FUA	400	French Navy	600, 800, 1,350 ¹	O ³	N	—	³ Works in connection with Bizerte-Sidi- Abdallah
Cap-bon	..	37° 04' 48" N. 11° 02' 23" E.	FFT	100	French Navy	300, 600	P G	0700 to 2200	0.40 ²	⁴ A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of the radio compass work
										⁵ In conjunction with Sette-Meriem T.S.F.
										⁶ In exceptional cases a wavelength of 600 metres can be used
										⁷ For regulations relating to W/T D.F. stations see under Tunis in D.F. section
										⁸ Approximately
TURKEY										
Osmanie	..	—	OSM	—	—	5,500	—	—	—	
Smyrna ³	..	—	—	—	—	—	—	—	—	
UNITED STATES OF AMERICA		Meridian of Greenwich.								
Abilene	..	Texas	ZAX	—	Eugene W. Wood, 340, Butternut Street	200, 375	—	—	—	¹ No coast charge ² Communicates only with aeroplanes
Albany	..	New York 73° 45' 00" W. 42° 39' 00" N.	WNY	75	Shotton Radio Manufacturing Co.	360	P R ³⁸	0730 to 0945	—	³ Coast charge 3 fr. for 10 words, each additional word 0.25 fr.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge		Remarks
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Alpena	Michigan 45° 03' 00" N. ⁵ 83° 20' 00" W.	NSM	150	U.S. Navy ..	600, 1,200 ³⁰	PG ³⁸ ..	N	0.30	—	⁴ Time of the 75th meridian ⁵ Approximately
Altadena	California 118° 07' 37" W. 34° 11' 34" N.	KGO	25	Altadena Radio Laboratory	360	PR ³⁸ ..	0100 to 0200 0600 to 0700	—	—	⁶ Great Lakes Naval training station
Amarillo	Texas	WDAG	50	J. Laurence Martin, 605, East Fourth Street	360	PR ³⁸ ..	X	—	—	⁷ The station is open to relaying public correspondence in emergencies
Amagansett .. .	Long Island 40° 58' 10" N. 72° 07' 27" W.	NAH	—	—	—	DF ³⁸ ..	—	—	—	⁸ Distribution of weather forecasts, workings and information. (See International Time and Weather Signals)
Amagansett .. .	Long Island 40° 58' 10" N. 72° 07' 27" W.	NBM	—	U.S. Navy ..	800	DF ³⁸ ..	—	—	—	⁹ The station sends time signals daily from 1155 to 1200 (standard time of the meridian 75° W. of Greenwich) on the wavelength of 1,832 metres (spark)
Amagansett NBM ..	New York 40° 58' 10" N. 72° 07' 27" W.	NBM	200	U.S. Navy ..	800, ³⁸ 975, ³⁸ 1,851	O ..	N	—	—	¹⁰ The station sends time signals daily at 1630 (time of the meridian 75° W. of Greenwich) after the meteorological message on the wavelength of 2,700 metres (spark) and at 2300 (time of the meridian 75° W. of Greenwich) after the meteorological message on the wavelength of 2,700 metres (spark)
Ambrose Channel Light Vessel (L.V. No. 97)	New York 40° 58' 10" N. 73° 50' 03" W.	NALS	—	U.S. Navy ..	300, 378, 476, 800, 756, 952, 1,000	O, D F ⁷ and Submarine Signal Oscillator	X	—	—	¹¹ Station transmits an ice report (North Atlantic) at 1700 (time of the meridian 75° W. of Greenwich) on a wavelength of 17,125 metres
Anacostia	District of Columbia 38° 52' 21" N. 77° 00' 11" W.	NFS	200	Navy	597	— ²	N	—	—	¹² The Hydrographic Office gives publicity to all
Anacostia (Naval Laboratory)	District of Columbia	NOF	—	U.S. Navy ..	Variable	O ..	X	—	—	
Annapolis NAK ..	Maryland 36° 59' 12" W. 38° 59' 00" N.	NAK	—	U.S. Navy ..	600	O ..	X	—	—	
Annapolis NSS ..	Maryland Chesapeake Bay 38° 59' 25" N. 76° 27' 00" W.	NSS	5,000	Navy	7,900, 800, 10,110, 10,510, 17,125 ¹¹ , 17,145 ¹¹ , 17,000	O ¹² ..	N	—	—	
Annapolis	Maryland	NZO	—	U.S. Navy ..	Variable	O ..	X	—	—	

Atka Island ..	WJI	—	Bureau of Education	900	O	0800 to 2400	—	information relative to ice and its movement in the North Atlantic, by the following methods: Washington NAA, 1030 = 5,950; 1200 = 2,650; 2200 = 2,650; Boston NAD, 1100 = 1,620, 1700 = 1,620; New York NAA = 1,620; 1832, 1730 = 1,832; Philadelphia NAL, 1045 = 1,948; 1700 = 1,948; Norfolk, Virginia, NAM, 1045 = 1,851; 1600 = 1,851; Charleston, South, 1030 = 2,250; Carolina, 1800 = 2,250; Ice Patrol Ship, 1800 = 600. The ice patrol vessel will give ice information at any time to any ship with which the patrol vessel can communicate on 600 metres wavelength
Appledore Island ..	NTW	100	U.S. Navy	800	DF ¹⁹ ..	N	—	¹³ No charge is made for relaying messages
Ann Arbor ..	XA	—	University of Michigan	200, 375	—	—	—	¹⁴ The station sends time signals daily at 1600 and 2100 (time of the meridian 75° W. of Greenwich) on the wavelength of 1,988 metres (spark)
Arlington ..	NAA	—	—	2,500, 2,650 ⁸	8.30	—	—	¹⁵ The station sends time signals daily from 1155 to 1200 (standard time of the meridian 120° W. of Greenwich), Sundays and holidays excluded, on the wavelength of 1,512 metres (spark)
Astoria ..	NUZ	1,000	Navy	4,525, 5,000	O.	N	—	¹⁶ Radio time signals are sent out daily from 1155 to 1200, and 2155 to 2200 (standard time of the meridian 75° W. of Greenwich) on the wavelength of 1,988 metres (spark)
Athol ..	XP	—	Leon W. Bishop, 160, Cottage Street	Variable	—	—	—	¹⁷ Time signals are sent daily from 1155 to 1200, and 2155 to 2200 (standard time of the meridian 75° W. of Greenwich) on the wavelength of 17,145 metres (arc)
Atlanta ..	WDAW	100	Georgia Railway and Power Co., Technological High School	360, 485	PR ³⁹ ..	X	—	
Atlanta ..	XI	—	Atlanta Journal	200, 275	—	—	—	
Atlanta ..	WSB	—	Emory University	360, 485	PR ³⁹ ..	—	—	
Atlanta ..	XA	—	University of Texas	200, 275, 375, 360, 485	PR ³⁹ ..	X	—	
Austin ..	WCM	300	—	—	—	—	—	
Austin ..	XX	—	Tom L. Grey, 3,908, Avenue F.	Variable	—	—	—	
Bakersfield ..	ZS	—	Lindley Winsor, 200, Twenty Second Street	200, 375	—	—	—	
Bakersfield ..	KDZB	25	Frank E. Stiebert, 1,402, Twentieth Street	360	PR	X	—	
Bakersfield ..	KYI	50	Alfred Harrel, 1925, I. Street	360	PR ³⁹ ..	X	—	
Bakersfield WJT	WJT	90	—	300, 400, 600	PR	X	—	
Baltimore ..	WCAO	50	Sanders & Stayman Co., 319, North Charles Street	360	PR ³⁹ ..	X	—	
Baltimore ..	NBZ	80	Navy	800, 700 ³⁰	PG ^{33 30}	0800 to 2400	0.30	
Baltimore ..	WKC	50	Joseph M. Zamowski Co.	360	PR ³⁹ ..	0730 to 0830 Tuesday, Thursday and Saturday	—	
Bangor ..	XG	—	Bangor Railway and Electric Co., Graham Building	275, 375	—	—	—	
Bar Harbor NBD	NBD	300, 1,000	Government	600, 975, 2,400, 2,750, 3,750, 3,950	PG	N	0.50	
Bar Harbor ..	NBD	100	—	800	DF	—	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Barneget ..	Meridian of Greenwich. New Jersey Tuckerton 74° 23' 00" W. 39° 33' 00" N. ¹⁸ Michigan	WCI	—	Radio Corporation of America	300, 600, 16,800	P R ²⁹ ..	N	—	—	¹⁸ Time signals are sent daily from 1155 to 1200 (standard time of the meridian 120° W. of Greenwich) on the wavelength of 2,000 metres
Bay City ..	Texas 29° 44' 20" N. 95° 00' 30" W.	WTP	—	George M. McBride	360	P R ³⁰ ..	—	—	—	¹⁹ Where two or more direction finding stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station, the call signal being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the direction finding stations under its control. (See Int. Time and Weather Section—U.S.A.)
Baytown ..	North Carolina 34° 43' 09" N. 76° 40' 20" W.	KDPS	200	Humble Oil Refining Co.	300, 600	P R ..	X	—	—	²⁰ Only in case of fog
Beaufort ..	Texas 29° 44' 20" N. 95° 00' 30" W.	NAN	—	Navy ..	300, 600	—	—	—	—	²¹ Wireless fog signals are transmitted continuously during thick or foggy weather, consisting of a series of triple dashes etc.) for 60 seconds, then silence for 6 minutes
Beaumont ..	Texas 30° 08' 00" N. ¹⁸ 93° 58' 00" W.	WOD	250	Magnolia Petroleum Co., Beaumont (Texas)	300, 440, 600	P R ..	X	—	—	²² Point Loma and Imperial Beach are operated as a group
Belfast ..	Maine 44° 24' 50" N. 69° 00' 25" W.	WNN	200	Radio Corporation of America	300, 450, 600, 1,800	P G ..	— ¹	0.50	—	²³ Information concerning wrecks, derelicts, ice and other dangerous obstructions to navigation
Bellefonte ..	Pennsylvania 45° 00' 24" N. 76° 40' 20" W.	WWQ	250	Post Office Dept.	150, 3,800	— ²	0800 to 1200 ⁴⁴ 1300 to 1700	—	—	
Bellingham ..	Washington 48° 00' 00" N. 121° 30' 00" W.	KDZR	50	Bellingham Publishing Co.	360	P R ³⁰ ..	X	—	—	
Belmar ..	New Jersey 40° 00' 00" N. 74° 00' 00" W.	XAO	—	Radio Corporation of America	Variable	—	—	—	—	
Berkeley ..	California 37° 52' 43" N. 122° 15' 43" W.	KQI	—	University of California	360	P R ³⁰ ..	X	—	—	
Berkeley ..	California 37° 52' 43" N. 122° 15' 43" W.	KRE	50	Maxwell Electric Co.	360	P R ³⁰ ..	X	—	—	
Berkeley ..	California	ZQ	—	Fred. L. Wismer, 1906, Chestnut Street	200, 375	—	—	—	—	
Bethany Beach ..	Delaware 38° 32' 45" N. 75° 03' 22" W.	NSD	100	—	D F	800 ..	N	—	—	
Bird Island ..	California 32° 49' 27" N. 122° 33' 12" W.	NLD	—	U.S. Navy ..	800	D F ..	N	—	—	

Land Stations

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Location	Lat.	Long.	Call	Freq.	Power	Remarks	Notes
Bolinas KPH	37° 54' 36" N 122° 40' 45" W	California	KPH	300	4,000	Radio Corporation of America	whenever received from the Hydrographic Office or from a branch hydrographic office is sent broadcast twice daily immediately following the local weather broadcast. (See Int. Time and Weather Section—U.S.A.)
Bolinas	37° 54' 12" N 122° 42' 30" W	California	NZP	3,500	300, 450, 600, 1,800	Radio Corporation of America	24 Communicat ions limited to vessels of the Panama Railroad Co.
Bolling Field Boston WVO	37° 54' 48" N 122° 43' 33" W	Anacostia (D.C.)	WVB WVO	—	—	U.S. Army Government	25 The four S. Francisco entrance stations are under the control of Farallan Island Radio, from which bearings should be obtained.
Boston	71° 03' 40" W 42° 21' 19" N	Massachusetts	XAF	—	—	Edison Electric Illuminating Co.	26 Ambrose Channel Light vessel transmits during thick or foggy weather a series of single dashes for 20 secs., then silent 20 secs.
Boston (Portable)	71° 03' 40" W 42° 21' 19" N	Massachusetts	XAG	—	—	Edison Electric Illuminating Co.	27 The light vessel transmits radio signals continuously during thick or foggy weather, consisting of a series of double dashes for 25 secs., then silent for 25 secs.
Boston	71° 03' 40" W 42° 21' 19" N	Massachusetts	NAD	—	—	U.S. Navy	28 For regulations relating to W/T D.F. stations see under U.S.A. in D.F. section
Boston WBF	71° 03' 40" W 42° 21' 19" N	Massachusetts	WBF	500	600, 975, 1,620, 3,950, 5,000	Tropical Radio Telegraph Co.	29 The station sends time signals daily from 1155 to 1200 and from 2155 to 2200 (standard time of the meridian 75° W. of Greenwich) on the wavelength of 2,650 metres (spark)
Boulder	71° 03' 40" W 42° 21' 19" N	Colorado	XAQ	—	—	University of Colorado (Dept. of Electrical Engineering)	30 Local distribution of weather information by naval radio stations. (See International Time and Weather Signals)
Bridgeport	41° 53' 00" N 72° 53' 00" W	Philadelphia	XAE	—	—	Diamond State Fiber Co., Ford Street	31 The wireless fog signals are operated daily from 1700 to 1730 and from 2300 to 2330 and continuously during thick or foggy weather. The signals consist of a series
Brownwood	36° 53' 00" N 101° 53' 00" W	Texas	XF	—	—	Howard Payne College	
Brownsville	28° 53' 00" N 98° 53' 00" W	Pennsylvania	WDAQ	—	—	Hartman - Riker Electric and Machine Co., 312 Market Street	
Bryan ⁴ Buffalo	42° 53' 00" N 98° 53' 00" W	Ohio	KDEL WGR	400	360, 485	Post Office Dept. Federal Telephone & Telegraph Co.	
Buffalo	42° 53' 00" N 98° 53' 00" W	New York	WWT	30	360	McCarthy Bros. & Ford	
Buffalo	42° 53' 00" N 98° 53' 00" W	New York	XAD NNZ	200	200, 250, 375, 600, 1,200 ³⁰	106	
Buffalo	42° 53' 00" N 98° 53' 00" W	New York	ZM	—	200, 375	Cyrus H. Fraser, 48 Glenwood Avenue	
Burlington	44° 28' 00" N 73° 12' 00" W	Vermont	WCAX	100	360	University of Vermont	
Burwood	30° 54' 36" N 122° 40' 45" W	Louisiana	WBW	—	300, 600, 1,700	T.R.T. Co.	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength Type).	Nature of Service.	Hours of Service.	Coast Charge. Francs.	Remarks.
								Per Word.	Min-imum Charge.
UNITED STATES OF AMERICA—contd.									
Butte..	Meridian of Greenwich, Montana 112° 37' 00" W. 46° 00' 00" N. ⁵	KMN	200	Montana Power Company	550, 1,700	P R ..	X	—	of double dashes every minute, thus: — (— — — — —, etc.)
Butte..	Montana	YP	—	Butte College of Telephony (F. H. Smith)	200, 375	—	—	—	30 secs. silent interval, (— — — — —, etc.)
Byron Camden	Illinois New Jersey 74° 07' 24" W. 39° 56' 30" N.	ZG WRP	—	Albert C. Mertz Federal Institute of Radio Tele- graphy	200, 375 360	P R ³⁸ ..	— 0100 to 0400 0730 to 0930	—	Vessels equipped with D.F. apparatus can determine their bearing from the light vessel by the above signals
Camp 60	California 119° 09' 00" W. 37° 15' 00" N.	KDPV	50	Southern California Edison Company	527 c.w.	P R ..	X	—	³⁸ For radiotelegrams exchanged with ships trading in the Great Lakes Service
Camp 61	California 119° 05' 00" W. 37° 8' 30" N.	KDPW	50	Southern California Edison Co.	527 c.w.	P R ..	X	—	³⁸ The station is provisionally closed
Camp 61 C	California 119° 05' 00" W. 37° 18' 30" N.	KEM	50	Southern California Edison Co.	527 c.w.	P R ..	X	—	³⁸ Continuous watch in heavy or foggy weather
Camp Alfred Vail	New Jersey 119° 05' 00" W. 37° 18' 30" N.	WUBA	—	U.S. Signal Corps	—	— ³⁸	X	—	³⁸ This station only gives a limited service from 100° to 160°
Camp Knox	Kentucky	WUBC	—	U.S. War Dept. Signal Corps	—	— ³⁸	X	—	³⁸ The station sends time signals daily from 1055 to 1100 (standard time of the meridian, Greenwich) on the wave-length of 1,988 metres (spark)
Camp Marfa	Texas	WUG	—	U.S. War Dept. Signal Corps	1,350, 1,700, 2,100, 2,700, 3,100, 3,850 360	— ³⁸	X	—	³⁸ The charge is reduced to 15 centimes per word for correspondence exchanged with ships plying on Long Island Sound
Canton	New York	WCAD	50	St. Lawrence University	360	P R ³⁸ ..	X	—	³⁸ For listening in
Canton	Ohio 81° 23' 16" W. 40° 45' 01" N.	WWB	100	Daily News Printing Co.	300, 600	P R ³⁸ ..	X	—	³⁸ Fixed stations only
Cape Blanco	Oregon 124° 50' 22" N. 124° 33' 30" W.	NPF	—	Government	300, 600	—	—	—	⁴⁰ When in consequence of the station being out of order, the emission of time signals cannot be effected from Washington NAA
Cape Cod	Massachusetts 70° 03' 42" W. 42° 02' 28" N.	NAE	1,000	—	300, 600	O ? ..	N	—	
Cape Elizabeth	Portland, Me. 43° 33' 59" N. 70° 11' 59" W. ⁵	NAB	100	—	800	DF ..	—	—	

Cape Hatteras	..	NDW	100	—	800	D F	..	—	—	the station sends time signals daily from 1155 to 1200 (standard time of the meridian 75° W. of Greenwich), Sundays and holidays excluded, on the wavelength of 1,908 metres spark
Cape Hatteras	NDW	NDW	150	Navy ..	600, 975, 1,620	P G	..	N	0.30	⁴¹ When in consequence of the station being out of order the emission of time signals cannot be effected from Washington, NAA, the station sends time signals daily from 1155 to 1200 (standard time of the meridian 75° W. of Greenwich), Sundays and holidays excluded, on the wavelength of 2,250 metres (spark)
Cape Henlopen	..	NSD	—	—	800	D F	..	—	—	⁴² This is the direction finding wavelength
Cape Lookout	..	NAN	100	U.S. Navy	800	D F	..	N	—	⁴³ Not yet in operation
Cape May	..	NSD	100	—	800	D F	..	—	—	⁴⁴ Meridian 75° W. of Greenwich
Cape May NSD	..	NSD	200	U.S. Navy	300, 600	O	..	N	—	⁴⁵ Meridian 105° W. of Greenwich
Cape May WCY	..	WCY	150	Radio Corporation of America	300, 600, 1,610	P G	..	N	0.50	⁴⁶ Meridian 120° W. of Greenwich
Cascadia	..	KDPU	50	Southern California Edison Co.	527, 1,650	P R	..	X	—	
Casper	..	KDC	200	Illinois Pipe Line Company	1,685	P R	..	X	—	
Cattle Point	..	NFN	100	—	800	D F	..	— ⁴⁴	—	
Centerville	..	WDAX	50	First National Bank, 101, East Van Buren St. E. A. Hollingsworth, 203, North Tower Avenue	360	P R ⁴⁹	..	X	—	
Centralia	..	KDZM	50	—	360	P R ⁴⁹	..	X	—	
Charleston	..	NAO	300, 1,000	Pacific Telephone & Telegraph Co.	300, 600, 1,000, 1,800	P G ¹²	..	N	0.30	
Charlotte	..	WBT	100	Southern Radio Corporation	360	P R ⁴⁹	..	1000 to 1145 0730 to 0945	—	
Chatham	..	NXA	100	U.S. Navy	800	D F	..	X	—	
Chatham NXA	..	NXA	—	U.S. Navy	600, 975, 1,870	O	..	N	—	
Chatham WIM	..	WIM	350	Radio Corporation of America	300, 450, 600, (c.w.)	P G	..	N	0.50	
Cheboygan	..	KUXM	100	Warren W. Katham	300, 400, 600	— ⁴⁹	..	X	—	

City	State	Lat.	Long.	Call	Alt.	Pop.	Off.	Dist.	Remarks
Cincinnati	Ohio	39° 05' N.	84° 33' W.	XAH	—	—	Ohio Institute, Canal and Walnut Streets	150 to 390	—
Cincinnati	Ohio	39° 05' N.	84° 33' W.	XAJ	—	1,650	Union Gas & Electric Co., Front and Rose Streets	—	—
Clearwater	California	33° 53' N.	118° 09' W.	KOK	500	300, 600, 3,375, 4,200, 5,500	Federal Telegraph Co.	0700 to 2300	—
Cleveland	Ohio	41° 30' N.	81° 30' W.	KDPM	—	300, 330, 500, 600	Westinghouse Electric & Manufacturing Co.	P	—
Cleveland NRH	Ohio	41° 30' N.	81° 30' W.	NRH	300-450	300, 600, 1,080, 2,400, 4,250	U.S. Navy	P 23 30	0.30
Cleveland WHK	Ohio	41° 30' N.	81° 30' W.	WHK	60	360 (c.w.)	—	— 39	0130 to 0200 0330 to 0400 2000 to 2130 23 hrs. during 24
Cleveland	Ohio	41° 30' N.	81° 30' W.	WGO	100	300, 450, 600	Radio Corporation of America	P G	—
Cleveland	Ohio	41° 30' N.	81° 30' W.	XT	—	Variable	Cleveland Electric Illuminating Co.	—	—
College Park	Georgia	33° 41' N.	84° 27' W.	WDAJ	100	360	Atlanta & West Point R.R. Co.	P R 39	X
Colorado Springs	Colorado	38° 41' N.	104° 58' W.	XC	—	200, 375	Colorado College	—	—
Columbus	Ohio	39° 55' N.	82° 55' W.	WBAY	200	300, 485	Entekin Electric Co.	P R 39	X
Columbus	Ohio	39° 55' N.	82° 55' W.	WCAH	200	360	—	—	—
Columbus	Ohio	39° 55' N.	82° 55' W.	YO	200	—	Ohio State University	—	—
Columbus	Ohio	39° 55' N.	82° 55' W.	XJ	200	200, 375	Ohio State University	—	—
Columbus	Ohio	39° 55' N.	82° 55' W.	ZAF	200	200, 375	Robert C. Bohannan, 1918, Indianapolis Avenue	—	—
Columbus	Ohio	39° 55' N.	82° 55' W.	ZO	200	200, 375	Loren G. Windom, 1,375, Franklin Avenue	—	—
Conway	Arkansas	35° 55' N.	92° 55' W.	XAC	—	200, 375	Conway Radio Laboratories	P R	—
Coram Hill	New York	40° 55' N.	74° 56' W.	WQL	4,000	300, 600, 1,900	Radio Corporation of America	—	X
Corvallis	Oregon	44° 30' N.	124° 05' W.	YJ	—	200, 375	Oregon Agricultural College, Dept. of Physics	—	—
Cranton	Rhode Island	41° 55' N.	71° 30' W.	WKAP	—	300, 475, 600	Dutree W. Flint	P	X
Davenport	Iowa	41° 55' N.	90° 30' W.	XAC	—	Variable	—	—	—
Davenport	Iowa	41° 55' N.	90° 30' W.	YAP	—	200, 375, 410	Saint Ambrose College	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Davton	Meridian of Greenwich.	WFO	100	—	360, 485 c.w.	— ³⁹	X	—	—	
Dallas	Ohio	KUXP	150	Continental Radio Telephone Co., Dallas, Texas	300, 500, 600	— ³⁹	N	—	—	
Dallas	32° 47' 00" N. ⁵ 96° 48' 00" W.	WDAO	50	Automotive Electric Co., Ervay and Corsicana Streets	360	P R ³⁹ ..	X	—	—	
Dallas WRR	Texas	WRR	200	Police and Fire Signal Dept., Dallas (Texas)	360, 485	P R ..	X	—	—	
Dallas	96° 47' 00" W. 32° 46' 00" N. ⁵	ZAQ	—	City of Dallas, Police and Fire Signal Dept.	200 , 375	—	—	—	—	
Dallas	Texas	ZAY	—	A. H. Belo & Co.	200 , 375	—	—	—	—	
Dearborn	Michigan	KDEN	150	Henry Ford ..	300, 460, 480, 500, 520, 600	— ³⁹	X	—	—	
Dearborn	83° 14' 00" W. 63° 14' 00" W.	WWI	100	Ford Motor Co. ..	360	P R ³⁹ ..	X	—	—	
Dearborn	42° 18' 00" N. Michigan	XD	—	—	460, 480, 500, 520 800	—	—	—	—	
Deer Island	Massachusetts	NAD	100	U.S. Army ..	—	D F ..	N	—	—	
Decatur	42° 21' 15" N. 70° 57' 30" W. Illinois	WCAP	200	Central Radio Service, 211, Main Street	360	P R ³⁹ ..	X	—	—	
Defiance	Ohio	WCAQ	150	Tri-State Radio Manufacturing & Supply Co., 309, Clinton Street	360	P R ³⁹ ..	X	—	—	
Delanco	New Jersey	XP	—	Henry M. Neely	250	—	—	—	—	
Del Monte	California	KLN	50	Noggle Electric Works	360	P R ³⁹ ..	—	—	—	0700 to 0900

Denver	..	Colorado 105° 00' 01" W. 40° 00' 00" N.	KDYY	100	Rocky Mountain Radio Corp.	360	PR ²⁹ ..	X	—	—
Denver	..	Colorado 105° 00' 00" W. 39° 45' 00" N.	KDZQ	50	Motor Generator Co., 429, South Sherman Street	360	PR ²⁹ ..	X	—	—
Denver	..	Colorado 105° 00' 00" W. 39° 45' 00" N.	KLZ	150	Reynolds Radio Co.	360, 485	PR ²⁹ ..	X	—	—
Denver	..	Colorado 105° 00' 00" W. 39° 45' 00" N.	KOA	100	Y.M.C.A. ..	485	PR ²⁹ ..	X	—	—
Denver	..	Colorado 105° 00' 00" W. 39° 45' 00" N.	YAL	—	Y.M.C.A. Radio Telegraph & The Register and Tribune	—	—	—	—	—
Des Moines	..	Iowa	WGF	—	Iowa Radio Corp.	360	PR ²⁹ ..	—	—	—
Des Moines	..	Iowa	WHX	—	Des Moines Uni- versity	200, 375	—	—	—	—
Des Moines	..	Iowa	YAO	—	U.S. Army ..	800	DF ²⁸ ..	N	—	—
Detour Point	..	Michigan 45° 57' 19" N. 83° 54' 53.65" W.	NZU	100	Detroit-Edison Co.	300, 400, 600, 1,025	PR ..	X	—	—
Detroit, KDPH	..	Michigan 83° 03' 40" W. 42° 20' 05" N.	KDPH	150	Detroit Police Dept.	360	PR ²⁹ ..	0300 to 1100	—	—
Detroit	..	Michigan 83° 15' 03" W. 42° 19' 40" N.	KOP	100	Navy ..	600, 975	PG ..	N	0.30	—
Detroit NRQ	..	Michigan 42° 20' 00" N. 83° 10' 00" W.	NRQ	250	Detroit Free Press	360, 485	PR ²⁹ ..	X	—	—
Detroit	..	Michigan 83° 15' 03" W. 42° 19' 40" N.	WCX	200	Detroit News ..	300, 360, 600	PR ..	X	—	—
Detroit WWJ	..	Michigan	WWJ	200	Detroit News, 615, Lafayette Boule- vard	360	—	—	—	—
Detroit	..	Michigan	XO	—	Navy ..	1,000	DF ²¹ ..	—	—	—
Diamond Shoal Light Vessel	..	Minnesota 46° 47' 06" N. 92° 06' 10" W.	NITQ	—	U.S. Navy	600, 1,200	PG ..	N	0.30	—
Diamond Shoal Light- ship	..	Michigan 88° 08' 45" W. 47° 27' 49" N.	NLB	—	I.W.T. Co. ..	300, 600	PG ..	N	0.50	—
Duluth	..	New York 72° 12' 33" N. 40° 57' 28" N.	NUX	300	—	600, 1,200 ²⁰	PG ^{20 23}	N	—	—
Eagle Harbour	..	Michigan 84° 26' 00" W. 42° 44' 00" N.	NUG	150	—	485	—	X	—	—
East Hampton	..	..	WSA	900	..	..	..	..	..	..
East Lansing	..	..	WHW	50	..	..	..	..	..	..

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.	Remarks.
						Per Word.	Mini- mum Charge.		
UNITED STATES OF AMERICA—contd.	Meridian of Greenwich.								
East Moriches ..	New York 72° 46' 05" W. 40° 48' 00" N.	WSE	1,000, 1,600	Independent Wire- less Telegraph Co.	300, 800 , 1,800, 2,800	P G and P R.	N	0.50	
East Palestine ..	Ohio	ZJ	—	R. D. McCommon, 268, North Market Street	200 , 375	—	—	—	
Edgewood ..	Rhode Island 71° 25' 00" W. 41° 50' 00" N.	WEAG	50	Nichols-Hineline- Bassett Labora- tory, 94, Arm- ington Street	360	P R ³⁹ ..	X	—	
Eldorado ..	Kansas	WAH	200	Midland Refining Co.	440, 485	P R ³⁹ ..	Local Time 0800-1730 X ⁴⁶	—	
Elko ..	Nevada	KDEJ	—	Post Office Dept.	2,200 , 3,400	— ²	0800 to 1200 1300 to 1700	—	
Ellsworth ..	Maine	XC	—	Bangor Railway & Electric Co., Graham Build- ing, Bangor, Me.	275, 375	—	—	—	
El Paso ..	Texas	ZAR	—	Elite Electric Shop, 407, Mesa Avenue	200 , 375	—	—	—	
El Paso ..	Texas	WDAH	100	Mine & Smelter Supply Co., 412, San Francisco Street	360	P R ³⁹ ..	X	—	
Empire ⁴³ ..	Oregon 43° 23' 03" N. 124° 18' 58" W.	NPF	100	U.S. Navy	800	D F	N	—	
Ensenada ..	Pennsylvania 80° 05' 00" W. 42° 07' 00" N.	WJT	400	Electric Equip- ment Co.	— 360	P R ³⁹ ..	1930 to 2130 Monday, Wednesday and Friday	—	
Erie ..	Oregon	KDZJ	—	Excelsior Radio Co., Box 33	360	P R ³⁹ ..	X	—	
Eugene ..	California 40° 41' 47" N. 124° 16' 16" W.	KPM NPW	100	U.S. Navy	2,000 300	D F	N	—	

Eureka	..	California, Table Bluff 124° 16' 24" W. 40° 17' 45" N. Washington 122° 15' 00" W. 48° 00' 00" N. Washington	NPW	450-600'	Government	..	300, 600, 1,000, 1,800, 2,000	P, G, 18 30	N	0.50
Everett	KFT	300	American Tugboat Co.	..	300, 440, 550, 600	P, G	N	—
Everett	KJB	—	Puget Sound Tele- phone Co.	..	200, 300, 340, 600	P, R	X	—
Fairfield	WYD KDAH	175	U.S. Army C. E. Davis Pack- ing Co.	..	300, 450, 600	O — 39	—	—
Fall River Valley	KDQJ	500	Pacific Gas & Elec- tric Co.	..	1,650	P, R	X	—
Farallon Island ³⁵	NPI	100	—	..	300, 600, 800 ⁴²	D, F	—	—
Fargo	WDAY	100	Kenneth M. Hance, 117, Broadway	..	350, 485	P, R ³⁶	X	—
Fayetteville	ZAZ	—	Lawrence W. Stin- son, 354, North West Street	..	200, 375	—	—	—
Ferris Oil Field	KDIC	200	General Pet. Cor- poration of California	..	425	P, R	X	—
Fire Island	NAH	100	—	..	300, 600, 800 ⁴²	D, F ²⁷	—	—
Fire Island Light Vessel	NSL	—	—	..	1,000	D, F ²⁷	—	—
Flagship Division I. Camp Bustis	WPF	20	U.S. Shipping Board	..	300, 476, 600	P, R	X	—
Flat Rock ²⁷	WFD	100	Henry Ford Co.	..	300, 385, 600	P, R	X	—
Flint	WEAA	500	Fallain & Lathrop, 104, W alsh Building	..	360	P, R ³⁸	X	—
Folly Island	NZV	100	Navy	..	800	D, F	N	—
Fort Andrews	WUA	—	U.S. Army (Signal Corps)	..	1,100	O	X	—
Fort Barrancas	WZD	100	U.S. Army (Signal Corps)	..	800, 800, 1,000, 1,150, 1,230	O	X	—
Fort Benjamin Har- rison	WVS	—	U.S. Army	..	—	O	X	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. (Francs).		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA - <i>contd.</i>										
Fort Bliss ..	Meridian of Greenwich. Texas 31° 45' 00" N. 106° 00' 00" W.	WZO	2,000	U.S. Army (Signal Corps)	3,100; 6,000, 7,000, 8,090, 10,000	O ..	N	—	—	
Fort Brown ..	Brownsville, Texas 28° 00' 00" N. 97° 30' 00" W.	WUZ	250	U.S. Army (Signal Corps)	1,350, 7,000	O ..	N	—	—	
Fort Casey ..	Washington, Puget Sound North Carolina	WZJ	50	U.S. Army (Signal Corps)	500	O ..	X	—	—	
Fort Caswell ..	North Carolina	WUT	30	U.S. Army ..	825	O ..	X	—	—	
Fort Constitution ..	New Hampshire 43° 04' 16" N. 70° 42' 40" W.	WZE	25	U.S. Army (Signal Corps)	300, 600	O ..	0800 to 1700	—	—	
Fort Crockett ..	Texas 29° 16' 28" N. 94° 48' 52" W.	WUX	30	U.S. Army (Signal Corps)	600, 960	O ..	X	—	—	
Fort Dade ..	Florida 27° 35' 41" N. 82° 45' 45" W.	WZK	25	U.S. Army (Signal Corps)	825	O ..	X	—	—	
Fort D. A. Russel ..	Wyoming 42° 24' 30" N.	WVW WEAB	— 150	War Dept. Standard Radio Equipment Co., 619, Carver Building	— 360	O P R ³⁹ ..	N X	—	—	
Fort Dodge ..	Iowa 42° 24' 30" N.	WVW WZN	— 35	U.S. Army (Signal Corps)	— 825	O O ..	N X	—	—	
Fort Douglas Fort du Pont	Utah 39° 34' 10" N. 75° 35' 20" W.	WVX WZN	— 35	U.S. Army (Signal Corps)	— 825	O O ..	N X	—	—	
Fort Hancock ..	New Jersey 40° 37' 57" N. 73° 17' 08" W.	WUB	—	U.S. Army (Signal Corps)	1,200	O ..	X	—	—	
Fort H. G. Wright	New York 41° 15' 20" N. 72° 01' 12" W.	WUC	150	U.S. Army (Signal Corps)	600	O ..	X	—	—	
Fort Howard Fort Huachuca ..	Maryland Arizona	WVQ WZP	— —	U.S. Army (Signal Corps)	— 2,300, 2,750	O O ..	X N	—	—	
Fort Leavenworth ..	Kansas 39° 21' 00" N. 94° 55' 31" W.	WUD	180	U.S. Army (Signal Corps)	1,800	O ..	X	—	—	

Fort	Levett	WUE	U.S. Army (Signal Corps)	300, 1,300	O	..	X	—	—
Fort Lowell	..	WUE	U.S. Army (Signal Corps)	300, 1,300	O	..	X	—	—
Fort McPherson	..	WVR	U.S. Army ..	—	O	..	N	—	—
Fort Monroe	..	WUF	U.S. Army (Signal Corps)	400, 600, 825, 1,100	O	..	X	—	—
Fort Morgan	..	WIO	Tropical Radio Telegraph Co.	300, 450, 600, 1,700	PR ³⁹	..	X	0.60	—
Fort Morgan	WUR	WUR	U.S. Army (Signal Corps)	600, 1,200	O	..	X	—	—
Fort Moultrie	..	WZF	U.S. Army (Signal Corps)	600, 825	O	..	X	—	—
Fort Omaha	..	WVU	U.S. Army ..	—	O	..	X	—	—
Fort Riley	..	WUI	U.S. Army (Signal Corps)	1,200	— ³⁹	..	X	—	—
Fort Rosecrans	..	WUS	U.S. Army (Signal Corps)	300, 575	O	..	X	—	—
Fort Sam Houston	..	WUJ	U.S. Army (Signal Corps)	3,100-9,500	O	..	N	—	—
Fort San Jacinto	..	WUY	U.S. Army (Signal Corps)	300, 1,200	O	..	X	—	—
Fort Screven	..	WZA	U.S. Army (Signal Corps)	825	O	..	X	—	—
Fort Sill	..	WUBD	U.S. War Dept. Signal Corps	—	O	..	X	—	—
Fort Smith	..	WCAC	John Fink Jewelry Co., 701, Garrison Avenue	360	PR ³⁹	..	X	—	—
Fort Stevens	..	NPE	—	800	DF	..	—	—	—
Fort Stevens	WUK	WUK	U.S. Army (Signal Corps)	1,100	O	..	X	—	—
Fort Totten	..	WUL	U.S. Army (Signal Corps)	600, 800, 1,100, 1,200	O	..	N	—	—
Fort Travis	..	WXP	U.S. Army (Signal Corps)	600, 900	O	..	X	—	—
Fort Wayne	..	XH	City of Fort Wayne, Department of Public Safety	Variable	—	..	—	—	—
Fort Washington	..	WXG	U.S. Army (Signal Corps)	825, 1,200	O	..	X	—	—
Fort Whitman	..	WZC	U.S. Army (Signal Corps)	400, 1,100	O	..	X	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Fort Winfield Scott	Meridian of Greenwich. California 37° 47' 36" N. 122° 38' 30" W. Washington	WUO	250	U.S. Army	1,100	O ..	X	—	—	
Fort Worden	..	WUN	125	U.S. Army (Signal Corps)	1,200	O ..	X	—	—	
Fort Worth KDMK	Texas 97° 20' 00" W. 32° 44' 00" N. ^s Texas	KDMK	80	Continental Radio Telegraphic and Telephone Co.	500	— ³⁸	N	—	—	
Fort Worth	..	WBAP	—	—	—	—	—	—	—	
Fort Worth	..	WCV	150	Midland Refining Co.	440 c.w.	PR ³⁸ ..	Local Time 0800 to 1730	—	—	
Fort Worth	Texas 97° 20' 00" W. 32° 44' 00" N. ^s Texas	WPA	100	Fort Worth Record	360, 485	PR ³⁸ ..	X	—	—	
Fort Worth	..	ZAH ZY	—	Fort Worth Record	200, 375	—	—	—	—	
Fort Worth	Texas	YS	—	Fort Worth Star Telegram	200, 375	—	—	—	—	
Fort Worth	Texas	NAD	100	Oba K. Garrett, 611½ Main St. U.S. Navy	200, 375	—	—	—	—	
Fourth Cliff	..	NAD	100	U.S. Navy	800	DF ..	N	—	—	
Frankfort	..	WFK	150	Ann Arbor Railway Co.	300, 450, 600	PG ..	0500 to 2400	0.15 ³²	—	
Fresno	..	KDZH	25	Fresno Evening Herald	360	PR ³⁸ ..	X	—	—	
Fresno	..	KMJ	150	San Joaquin Light & Power Corporation	360, 485	PR ³⁸ ..	1700 to 1800 Sunday 1900 to 2000 Tuesday and Friday	—	—	
Fresno	..	XU	—	San Joaquin Light & Power Corporation	—	—	—	—	—	
Frying Pan Shoals	..	NLC	—	Navy	300, 600	—	—	—	—	
Lightship Gatesburg	..	XW	—	Lombard College	200, 250, 375	—	—	—	—	

Galveston	KDLZ	Texas	KDLZ	500	Sugarland Industries, Sugarland (Texas) Navy	300, 375, 425, 600	— ²⁹	X	—
Galveston	NKB	Texas 29° 18' 54" N. 94° 47' 52" W. Massachusetts 42° 35' 19" N. 70° 31' 08" W. New York	NKB	150	Navy	600, 975, 1,813	PG ^{28 30}	N	0.30
Gloucester	NAD	100	—	800	DF	—	—
Governors Island	WVP	—	U.S. Army	—	O	X	—
Grand Coteau	XZ	—	St. Charles College	200, 250, 375	—	—	—
Grand Marais	NZT	100	—	800	DF ²⁸	—	—
Grand Rapids	ZAG	—	Charles E. Holmes, 310, West Brown Street The Tribune	200, 375	—	—	—
Great Falls	KDYS	100	—	360	PR ²⁹	X	—
Great Lakes	NAJ	300 1,000	U.S. Navy	600, 1,500 ⁸ 1,988, 3,800 3,950, 4,900 Variable	PG ^{8 30 28}	N	0.30
Great Neck	XAN	—	Harry Alexander, 20, West Thirty- fourth Street, New York, N.Y.	—	—	—	—
Hamilton	WBAU	200	—	—	—	—	—
Hamilton	WRK	100	Doron Brothers, Electric Co., 329, Terrace Avenue	360 c.w. 200, 275, 375	—	X	—
Hamilton	XAG	—	Pennsylvania State Police	400 c.w.	PR	X	—
Harrisburg	KDKA	200	The Courant	360	PR ²⁹	X	—
Hartford	WDAK	150	—	—	PG	N	—
Hedge Fence Light	NATD	100	—	300, 600	—	—	—
Vessel No. 9	XAF	—	Federal Telegraph Co.	200 to 530 300, 600, 4,100, 6,200, 8,500	PR	X	—
Highland Park	KGH	—	American Inter- national Ship- ping Corporation	—	P	X	—
Hillsboro	KDAB	—	Navy	800	DF	N	—
Hog Island	NCZ	100	—	—	—	—	—
Hog Island	KOP	—	Alfred P. Daniel, 2504, Bagby St.	360	PR ²⁹	X	—
Hood River	WCAK	50	Hurlburt-Still Elec- trical Co.	360, 485	PR ²⁹	X	—
Houston	WEV	—	—	—	—	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Franks.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Houston	Meridian of Greenwich, Texas	XAA	—	Hurlburt - Still Electric Co., 1201, McKinney Avenue	Variable	—	—	—	—	
Houston	Texas	XN	—	Ernest Hubner, 1607, McKee Street	200, 375	—	—	—	—	
Imperial Beach ..	S. Diego, Calif. 32° 35' 14" N. 114° 07' 54" W.	NPL	100	U.S. Navy ..	800	DF ..	N	—	—	
Indianapolis ..	Indiana	WOH	100	—	360 c.w.	— ⁸⁹	X	—	—	
Indianapolis ..	Indiana	WLK	200	Hamilton Manufacturing Co., Navy ..	360 c.w.	PR ..	X	—	—	
Indian Head ..	Maryland 38° 38' 00" N. 77° 10' 55" W.	NBG	100	—	365	O ..	X	—	—	
Iowa City ..	Iowa	KDTS	—	Post Office Dept. of Iowa	—	—	—	—	—	
Iowa City ..	Iowa	YA	—	State University of Iowa	—	—	—	—	—	
Ithaca	New York	WEAL	200	Cornell University	360	PR ⁸⁹ ..	X	—	—	
Jacksonville ..	Florida 30° 19' 25" N. 81° 38' 56" W.	NFI	150	U.S. Navy ..	300, 450 ⁸⁰ 800	PG ⁸⁸ ..	N	0.30	—	
Jacksonville ..	Florida	WCAN	50	South-Eastern Radio Telephone Co.	360.	PR ⁸⁹ ..	X	—	—	
Jacksonville ..	Florida	WCAL	200	Florida Times-Union	360, 485	PR ⁸⁹ ..	X	—	—	
Jefferson Barracks ..	Missouri 42° 10' 21" N. 38° 34' 44" W.	WVW	—	War Dept. ..	—	O ..	X	—	—	
Jefferson City ..	Missouri 42° 10' 21" N. 38° 34' 44" W.	WOS	100	—	485 c.w.	— ⁸⁹	X	—	—	
Jersey City ..	New Jersey 74° 03' 50" W. 40° 43' 50" N.	WNO	15	Wireless Telephone Co., of Hudson County, N.Y.	300, 360, 600 c.w.	PR ..	X	—	—	
Johnswood ..	Michigan 45° 50' 00" N. 83° 40' 00" W.	KUVQ	200	Kretan Co. ..	300, 450, 800	— ⁸⁹	X	—	—	

[illegible]

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Franks.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Light Vessel No. 5 ..	Meridian of Greenwich. Stone Horse Shoal, Mass. 41° 32' 00" N. ^s 60° 50' 00" W.	NANT	1,000	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 11 ..	Scotland, N.Y. 40° 26' 00" N. ^s 73° 55' 00" W.	NARV	125	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 20 ..	Cross Rip, Mass. 41° 20' 50" N. ^s 70° 17' 27" W.	NAQB	1,000	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 34 ..	Charleston, S. Carolina 32° 40' 39" N. ^s 79° 43' 41" W.	NAZJ	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 39 ..	Brenton Reef, R.I. 41° 25' 00" N. ^s 71° 22' 00" W.	NASB	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 41 ..	Vineyard Sound, Mass. 41° 22' 00" N. ^s 71° 00' 00" W.	NACX	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 42 ..	Hen & Chickens, Mass. 41° 27' 02" N. 71° 01' 06" W.	NAPP	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 44 ..	North East End, N.J. 38° 37' 00" N. ^s 74° 29' 00" W.	NARS	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 46 ..	Tail of Horse Shoe, VA. 36° 53' 49" N. 76° 00' 24" W.	NAZR	100	Dept. of Commerce	600	— [?]	N	—	—	
Light Vessel No. 47 ..	Pollock Rip, Mass. 41° 22' 00" N. ^s 69° 34' 00" W.	NANS	100	Dept. of Commerce	600	— [?]	N	—	—	

Light Vessel No. 48..	Cornfield Point, Conn. 41° 13' 00" N. ^s 72° 23' 00" W.	NAJC	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 52..	Fenwick Island Shoal, Del. 33° 26' 00" N. ^s 74° 46' 00" W.	NAJS	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 54..	Boston, Mass. 42° 20' 22" N. 70° 45' 26" W.	NADX	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 66..	Great Round Shoals, Mass. 41° 24' 11" N. 60° 54' 55" W.	NABJ	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 67..	Umatilla Reef Wash. 48° 00' 00" N. ^s 124° 51' 00" W.	NACV	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 68..	Fire Island, N.Y. 40° 28' 40" N. 73° 11' 26" W.	NLS	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 69..	Overalls, Del. 28° 48' 00" N. ^s 75° 01' 00" W.	NAKT	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 70..	San Francisco, Cal. 37° 45' 03" N. 122° 41' 20" W.	NAKS	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 72..	Diamond Shoals, N.C. 35° 05' 08" N. 75° 18' 38" W.	NITQ	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 73..	Pollock Rip Slue, Mass. 41° 36' 00" N. ^s 69° 53' 00" W.	NAFT	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 74..	Portland, Maine 43° 41' 30" N. 70° 05' 38" W.	NAMS	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 79..	Five Fathom Bank, N.J. 38° 47' 00" N. ^s 74° 34' 00" W.	NADV	125	Dept. of merce	600	— ⁷	N		
Light Vessel No. 80..	Cape Lookout Shoals, N.C. 34° 18' 00" N. ^s 74° 24' 00" W.	NABV	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 81..	Heald Bank, Texas 29° 06' 05" N. 94° 13' 27" W.	NLP	100	Dept. of merce	600	— ⁷	N		
Light Vessel No. 83..	Blunts Reef, Cal. 40° 36' 04" N. 124° 30' 14" W.	NACT	150	Dept. of merce	600	— ⁷	N		

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. (Fares).		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Light Vessel No. 84..	Meridian of Greenwich. Brunswick, Georgia 31° 00' 00" N. ⁵ 81° 00' 35" W.	NABX	125	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 85..	Nantucket Shoals, Mass. 40° 37' 05" N. 90° 36' 31" W.	NLA	150	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 87..	Ambrose Channel N. Y. 40° 36' 20" N. 74° 03' 05" W.	NALS	100	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 88..	Columbia, Oregon 46° 10' 30" N. ⁵ 124° 11' 00" W.	NAJT	100	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 91..	Winter Quarter Shoals, Va. 37° 55' 00" N. ⁵ 74° 56' 00" W.	NADT	100	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 93..	Swift Sure Bank, Washington 48° 31' 00" N. ⁵ 125° 00' 00" W.	NABT	100	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 94..	Frying Pan Shoals, N. C. 35° 33' 30" N. 36° 48' 20" W.	NLC	110	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 101	Cape Charles, Va. 37° 05' 00" N. ⁵ 75° 43' 00" W.	NAJV	100	Dept. of Commerce	600	— ⁷	N	—	—	
Light Vessel No. 102	South Pass, La. 28° 53' 19" N. 89° 26' 34" W.	NAGT	100	Dept. of Commerce	600	— ⁷	N	—	—	
Lima	Ohio 70° 00' 00" W. 41° 00' 00" N. ⁵	WBY	200	Illinois Pipe Company	1,700	P R ..	X	—	—	

Little Rock ..	97° 46' 00" W. 38° 33' 00" N. Arkansas	WCAV	50	son, 122, East Lincoln Street J. C. Dice Electric Co., 113, West Capitol Avenue Dr. L. M. Hunter and G. L. Car- rington Pacific Telegraph and Telephone Co. Colin B. Kennedy Co. W. R. Mitchell, 729, South Broadway Automobile Club of Southern Cali- fornia, 260, Figueroa Street Newbery Electric Corp., 724, South Olive Street Earle C. Anthony	360	PR ²⁹ ..	X	—	—
Little Rock ..	Arkansas	XAB	—	Variable	Variable	—	—	—	—
Long Beach	California 33° 46' 12" N. 118° 11' 17" W.	KUXT	50	son, 350, 400, 450, 500, 600	300, 350, 400, 450, 500, 600	— ²⁹	0700 to 2300	—	—
Los Altos ..	California	KLP	50	300, 360, 600 (c.w.)	300, 360, 600 (c.w.)	PR ..	X	—	—
Los Angeles	California	KDZD	100	360	360	PR ²⁹ ..	X	—	—
Los Angeles	California 118° 00' 00" W. 34° 00' 00" N.	KDZF	150	360	360	PR ²⁹ ..	X	—	—
Los Angeles	California 87° 50' 00" W. 43° 02' 00" N. ¹⁵	KDZP	—	360	360	PR ²⁹ ..	X	—	—
Los Angeles	California	KFI	—	—	—	—	X	—	—
Los Angeles	California	KFR	100	Air Line Trans- portation Co. Southern Cali- fornia Edison Co. C. R. Kierulff & Co.	300, 525, 600 300, 600, 1,650 360, 485	P .. PR .. PR ²⁹ ..	X X 0900 to 1000 1230 to 1300 1500 to 1700 1900 to 2100 X	—	—
Los Angeles KHI ..	California 118° 11' 00" W. 34° 09' 00" N. ¹⁵	KHI	200	—	—	—	—	—	—
Los Angeles	California 118° 14' 30" W. 34° 03' 00" N.	KHJ	150	—	—	—	—	—	—
Los Angeles	California	KJS	60	Bible Institute of Los Angeles Electric Lighting Supply Co., 216, West Third St. Boulevard Express	360 360 300, 600, 1,610 (c.w.) 360, 485 (c.w.)	PR ²⁹ .. PR ²⁹ .. PR ..	X X X	—	—
Los Angeles KYJ ..	California	KNX	—	—	—	—	0400 to 0500 1945 to 2100	—	—
Los Angeles	California	KOG	—	—	—	—	—	—	—
Los Angeles	California	KWH	—	—	—	—	—	—	—
Los Angeles	California	XAO	—	Arno A. Kluge ..	360, 485	—	—	—	—
Ludington ..	Michigan	WLD	—	Pere Marquette Ry. Co.	300, 450, 600	PG ..	0500 to 2400	—	—
Mackinac Island	Michigan 45° 51' 29" N. 84° 35' 57" W.	NUD	100	Navy ..	600, 975	PG ..	N	0.15	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—cont.										
McKeesport ..	Meridian of Greenwich. 70° 50' 00" W. 40° 35' 00" N.	WIK	50	K. & L. Electric Co.	360	P R ..	1830 to 1900 daily 1330 to 1430 Sunday 2100 to 2200 Tuesdays and Thursdays X	—	—	
Madison ..	Wisconsin 86° 23' 00" W. 43° 05' 00" N.	WHA	500	University of Wisconsin	300, 360, 470, 485, 600 (c.w.)	P R ..	—	—	—	
Madison ..	Wisconsin	XL	—	North Western Radio Co., 250, State Street	360	—	—	—	—	
Madison ..	Wisconsin	XM	—	University of Wisconsin (Dept. of Physics)	375 (variable)	—	—	—	—	
Managua ..	Nicaragua 86° 17' 00" W. 12° 17' 00" N.	NAZ	—	U.S. Navy ..	600 , 975, 1,832	O ..	N	—	—	
Manasquan ..	New Jersey 40° 07' 05" N. 74° 07' 57" W.	NAH	—	—	—	—	—	—	—	
Manistique ..	Michigan 45° 57' 36" N. 86° 15' 36" W.	NUB	200	Navy ..	600 , 1,080	P G ..	N	0.30	—	
Manitowoc NTY ..	Wisconsin 44° 07' 00" N. 87° 45' 00" W.	NTY	100	— ⁴³	300, 475, 600	P G ..	23 hours daily	— ^{16 82}	—	
Manitowoc ..	Wisconsin	WMW	—	Pere Marquette Ry. Co.	300, 475, 600	P G ..	23 hours daily	—	—	
Marion ..	Massachusetts 70° 46' 30" W. 41° 42' 45" N.	WCC	1,000	Radio Corporation of America	300, 600 , 2,800 (c.w.)	P G ..	N	0.50	—	
Marion ..	Massachusetts 70° 46' 30" W. 41° 42' 45" N.	WRQ	4,000	Radio Corporation of America	13,900 (c.w.)	P R ..	N	—	—	
Marion ..	Massachusetts	WSO	—	Radio Corporation of America	11,620	P R ..	N	—	—	
Marta ..	Texas	WUG	—	War Dept.	—	—	—	—	—	

Station	Locality	WHY	200	Illinois Pipe Line Company	1,685	PR	X	
Martinsville	87° 54' 06" W. 39° 20' 30" N.	NPF	300	U.S. Navy	600, 975, 1,948	O	N	—
Marshfield	43° 20' 38" N. 124° 13' 33" W.	WGI	200	—	360, 485	— ³⁹	X	—
Medford Hb'de	Massachusetts 71° 07' 45" W. 42° 22' 48" N.	WKN	50	Reichman-Crosby Co.	360, 485	P R ³⁹	X	—
Memphis	Tennessee 90° 03' 00" W. 35° 09' 00" N.	WPO	200	United Equipment Co.	360	P R ³⁹	1900 to 2130	—
Memphis	Tennessee 90° 03' 00" W. 35° 09' 00" N.	WYDB	500	Inland and Coastwise Waterways Service, War Dept.	600, 756, 952, 1,200, 1,500, 1,900	O	—	—
Mexia	Texas 80° 07' 43" W. 25° 47' 56" N.	WFM	300	Continental Radio Telegraph Co.	300, 475, 800	P R	0730 to 2300	—
Miami	Montana 46° 24' 22" N. 105° 40' 31" W.	NGE	300	U.S. Navy	600, 975, 1,620 ³⁹	P G ³⁹	N	0.30
Miles City	Wisconsin 43° 02' 50" N. 87° 50' 00" W.	KUXN	100	Miles City—Jordan Wireless Co.	500	— ³⁹	0800 to 1800	—
Milwaukee	Wisconsin 43° 02' 50" N. 87° 50' 00" W.	NUK	150	Navy	600, 975	P G	N	0.30
Milwaukee	Wisconsin 82° 50' 00" W. 43° 02' 50" N.	WAAK	—	—	360, 485	—	—	—
Milwaukee	Wisconsin 82° 50' 00" W. 43° 02' 50" N.	WCAY	25	Kesselman O'Driscoll Co., 517-519, Grand Avenue	360	P R ³⁹	X	—
Milwaukee	Wisconsin	YZ	—	Marquette University, 1115 Grand Avenue	200, 375	—	X	—
Minneapolis	Minnesota	KDPB	—	Post Office Dept.	—	— ²	X	—
Minneapolis	Minnesota 93° 25' 00" W. 44° 58' 20" N.	WCAS	100	William Hood Dunwoody Industrial Institute	360	P R ³⁹	X	—
Minneapolis	Minnesota 93° 14' 13" W. 44° 58' 21" N.	WLB	600	University of Minnesota	360, 410, 485 (c.w.)	P R	X	—
Minneapolis	Minnesota 93° 18' 00" W. 44° 59' 00" N.	WLP	100	Northern States Power Co.	425 (c.w.)	P R	X	—
Minneapolis	Minnesota	XI	—	—	200, 375, 1,100, 2,000	—	—	—
Minneapolis	Minnesota	YX	—	Wm. Hood Dunwoody Industrial Institute	200, 375	—	—	—
Mitchell Field	New York (Mineola, L.I.)	WYA	—	U.S. Army	—	O	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Morehead City ..	Meridian of Greenwich. North Carolina 76° 44' 00" W. 34° 43' 30" N.	NAN	150	U.S. Navy ..	600, 975, 1,654	P G ..	N	0.30	—	
Morgantown ..	West Virginia	WHD	—	West Virginia University	360	P R ²⁰ ..	1600 to 1800 and 1930 daily 1045 to 1200 Sundays	—	—	
Morgantown ..	West Virginia	YE	—	University of West Virginia, Dept. of Electrical Engineering	200, 375	—	—	—	—	
Muskogee ..	Oklahoma	WDAV	25	Muskogee Daily Phoenix	360	P R ²⁰ ..	X	—	—	
Nantucket Shoals Lightship ..	40° 37' 02" N. 69° 37' 06" W.	NLA	—	Navy ..	300, 600	—	—	—	—	
Nashville ..	Tennessee 86° 47' 00" W. 36° 10' 00" N. ⁵	WDAA	25	Ward - Belmont School, Belmont Heights	360	P R ²⁰ ..	X	—	—	
Naval Academy. (See Annapolis, MD)	Maryland	NAK	—	—	—	—	—	—	—	
Neenah ..	Wisconsin	ZL	—	Cornelius and William Quinn, 425, Sherry St.	200, 375	—	—	—	—	
Negley ..	Ohio	WCQ	—	Illinois Pipe Line Company	1,685	P R ..	X	—	—	
Newark ..	New Jersey 70° 10' 08" W. 40° 44' 15" N.	WBS	30	D. W. May ..	360	P R ²⁰ ..	X	—	—	
Newark ..	New Jersey 74° 10' 00" W. 40° 44' 00" N. ⁵	WJZ	300	Westinghouse Elect. and Mfg. Co.	300, 600	P R ..	X	—	—	
Newark WOR	New Jersey	WOR	—	Post Office Dept.	360 (c.w.) 300, 600, 3,100	— ²⁰ — ²	X X	—	—	
Newark WWU	New Jersey	WWU	—	Westinghouse Elect. and Mfg. Co., 95, Orange Street	Variable	—	—	—	—	
Newark ..	New Jersey	XAI	—	I. R. Nelson Co., Bond Street	Variable	—	—	—	—	
Newark ..	New Jersey	XAK	—	—	—	—	—	—	—	

New Bedford ..	Massachusetts 70° 53' 00" W. 41° 35' 00" N.	WDAU	50	Slocum & Kilburn, 23, North Water Street	360	P R ³⁹ ..	X	—	—
New Brunswick WII	New Jersey Belmar, New Jersey	WII	4,000	Radio Corporation of America	13,600	P R ..	N	—	—
New Brunswick WRT	New Jersey 74° 29' 15" W. 40° 30' 10" N.	WRT	4,000	Radio Corporation of America	11,500 (c.w.)	— ³⁹ ..	N	—	—
New Brunswick ..	New Jersey	XAM	—	Radio Corporation of America, 233, Broadway, New York, N.Y.	Variable	—	—	—	—
Newburgh ..	New York 74° 00' 35" W. 41° 30' 10" N.	WCAB	50	Newburgh News Printing and Publishing Co., 49, Grand Street	360	P R ³⁹ ..	X	—	—
New Dungeness ⁴³ ..	Washington 48° 10' 36" N. 123° 08' 41" W. ⁶	NFT	700	U.S. Navy ..	800	DF ..	— ⁸⁴	—	—
New Haven ..	Connecticut 72° 05' 02" W. 41° 18' 01" N.	WCJ WPG	300 150	A. C. Gilbert Nushawg Poultry Farm	300, 360, 600 360	PG P R ³⁹ ..	X 1300 to 1500 1900 to 2145	—	—
New London WLC ..	Connecticut 72° 05' 02" W. 41° 18' 01" N.	WLC	400	International Radio Telegraph Company	300, 450, 600	PG ..	N	0.50 ¹³	—
New London WST..	Connecticut 72° 05' 02" W. 41° 18' 01" N.	WST	200	Independent Wire- less Telegraph Co., New York	300, 450, 600	PG ..	N	0.50 ³⁸	—
New Orleans, NAT	Louisiana 29° 56' 51" N. 90° 01' 54" W.	NAT	300- 1,000	Navy ..	600, 1,000	O ⁹ ³⁰ ²³	N	—	—
New Orleans ..	Louisiana 74° 00' 35" W. 41° 30' 10" N.	WCAB	50	Newburgh News Printing and Publishing Co., 49, Grand Street	360	P R ³⁹ ..	X	—	—
New Orleans ..	Louisiana	WAAB	—	Valdemar Jensen, 137, South St., Patrick St.	—	—	—	—	—
New Orleans ..	Louisiana	WGV	100	Interstate Electric Co.	360	P R ³⁹ ..	—	—	—
New Orleans WNU	—	WNU	1,500	Tropical Radio Tel. Co., Boston (Mass.)	300, 600, 1,700, 2,850	PG ..	X	1100 to 1200 1900 to 2200	—
New Orleans WYDC	Louisiana	WYDC	500	Inland and Coast- wise Waterways Service, War Dept.	600, 1,832	O ..	N	—	—
New Orleans ..	Louisiana	XM	—	Electron Engineer- ing Co., 1115, Whitney Central Building	200, 375	—	—	—	—
New Orleans ..	Louisiana	YR	—	Loyola University	200, 375	—	—	—	—
Newport ..	Rhode Island 41° 35' 20" N 71° 17' 00" W.	NAF	300	Navy ..	600, 1,000	O ²³ ⁴⁰ ..	N	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Franes.	Remarks.
								Per Word.	Minimum Charge.
UNITED STATES OF AMERICA—contd.									
Newton	Meridian of Greenwich.	XK	—	Boston College	Variable	—	—	—	—
New York	Massachusetts	KUYS	300	Police Dept.	300, 400, 450, 600	PR ..	X	—	—
New York	73° 48' 48" W.	NAH	—	Navy	600, 1,000, 1,832	— ^s	—	—	—
New York	40° 41' 58" N.	WBC	600	Independent Wireless Telephone Co.	300, 600, 1,800	PG ..	N	0.50	—
New York	40° 38' 58" N.	WCG	300	Independent Wireless Telegraph Co. New York	300, 475, 600	PG ..	N	0.50 ³⁷	—
New York	74° 00' 00" W.	WDT	100	Western Electric Co., 453, West Street	300, 360, 600 (c.w.)	PR ..	X	—	—
New York	40° 41' 58" N.	WEAF	100	John Wanamaker	360	PR ³⁸ ..	X	—	—
New York	73° 58' 48" W.	WHI	100	Deforest Radio Telephone and Telegraph Co.	300, 360, 600	PR ..	0900 to 1700	—	—
New York	74° 00' 00" W.	WJX	100	Radio Corporation of America	300, 360, 600	PG ..	N	—	—
New York	40° 00' 00" N.	WNY	200, 300	Panama Railroad Co.	300, 600, 1,800 (c.w.)	PR ..	X	0.50	—
New York	New York	WSK	100	John Wanamaker	300, 450, 600	PR ..	—	—	—
New York	40° 41' 58" N.	WWZ	—	International News Service, 21, Spruce Street	360	PR ³⁹ ..	—	—	—
New York	73° 58' 48" W.	XAL	—	Columbia University	425, 3,000	—	—	—	—
New York	40° 41' 58" N.	XM	—	American Telephone and Telegraph Co., 24, Walker Street	Variable	—	—	—	—
New York	73° 58' 48" W.	XY	—	—	Variable	—	—	—	—
New York	40° 41' 58" N.	—	—	—	—	—	—	—	—
New York Harbour	Fort Columbus, Governors Island	—	—	—	—	—	—	—	—
	40° 41' 58" N.								
	74° 01' 48" W.								

STATION	NEBRASKA	WAKH	200	Midland Kenning Co.	440 (c.w.)	P R 39 .. PG 29 39 11 12	Local Time 0800 to 1730 N
Norfolk	Virginia 36° 49' 36" N. 76° 17' 43" W.	NAM	300- 1,000	Navy	600, 1,000	PG 29 39 11 12	0.50
Norfolk WPT	Virginia 76° 17' 43" W. 36° 49' 36" N.	WPT	150	Norfolk Dept. of Public Safety	300, 475, 600	P R ..	—
Northfield	Minn. 93° 09' 14" W. 44° 27' 41" N.	WCAL	200	St. Olaf College ..	360	P R 39 ..	—
North Head	Washington 46° 17' 56" N. 124° 04' 31" N.	NPE	500	U.S. Navy ..	300, 600, 1,000, 1,800, 2,000, 2,800	PG 31 12 23 30	0.30
North Island	S. Carolina 33° 13' 21" N. 79° 11' 06" W.	NZW	—	U.S. Navy ..	800	D F ..	—
North Plainfield	New Jersey 74° 30' 20" W. 40° 37' 33" N.	WEAM	—	Borough of North Plainfield	360	P R 39 ..	—
North Platte	Nebraska 42° 02' 23" N. 70° 03' 37" W.	KDHM NAE	100	Post Office U.S. Navy ..	2,900, 3,400 800	O 2 D F ..	—
Northville	Michigan 42° 20' 00" N. 83° 29' 00" W.	KDEP	50	Henry Ford ..	300, 425, 600	— 39	—
Northville Oakland	Michigan 46° 27' 53" N. 124° 03' 16" W.	XL KLS KLX	20 150	Warner Brothers Tribune Publish- ing Co.	425, 500 360 360	P R 39 .. P R 39 ..	— — —
Oakland KZM	California 122° 51' 43" W. 37° 47' 29" N.	KZM	—	—	300, 360, 600 (c.w.)	— 39	—
Oakland	California	XAR	—	Great Western Radio Corpora- tion, 19, Minna St., San Fran- cisco, California	200, 400	—	—
Oakland KZY	California	KZY	—	—	300, 360, 600 (c.w.)	P R ..	X
Ocean Park 43	Willapa Bay, Washington 46° 27' 53" N. 124° 03' 16" W.	NPE	100	U.S. Navy ..	800	D F ..	0000 to 0200 0400 to 0600 0800 to 1400 1600 to 2200
Ogden	Utah 111° 59' 00" W. 41° 13' 00" N.	KDZL	—	Rocky Mountain Radio Corpora- tion, 2311, Wash- ington Avenue	360	P R 39 ..	X
Oklahoma City	Oklahoma 97° 30' 00" W. 35° 30' 15" N.	WKY	100	Oklahoma Radio Shop	360, 485	P R 39 ..	1200 to 1300 1930 to 2130 1300 to 1600 1930 to 2130 Sundays
Oklahoma City	Oklahoma	XAF	—	Roswell B. Down- ing	200, 375	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Oklahoma City ..	Meridian of Greenwich, Oklahoma	ZAV	—	Le Roy Moffett, Jr., 312½, North Broadway Post Office Dept.	200, 375	—	—	—	—	
Omaha ..	Nebraska	KDEF	—	—	1,050, 2,900	—	X	—	—	
Omaha ..	Nebraska	WAAW	—	John O. Yeiser, Jr., Metropolitan Utilities District	360, 485	PR ³⁰ ..	—	—	—	
Omaha WOU ..	Nebraska	WOU	100	Hamilton Oil Corporation	360, 485 (c.w.)	PR ..	X	—	—	
Orange ..	Texas 30° 10' 00" N. 93° 07' 10" W.	WBAR	100	Hamilton Oil Corporation	1,625 (c.w.)	PR ..	X	—	—	
Orange Field ..	Texas 30° 10' 00" N. 93° 07' 50" W.	WBAS	—	Hamilton Oil Corporation	1,625 (c.w.)	— ³⁰	X	—	—	
Orange Owensboro ..	Texas 87° 04' 15" W. 37° 46' 47" N.	XAD WJC	200	Gray & Gray .. Indian Pipe Line Corporation	Variable 1,625 (c.w.)	PR ³⁰ ..	— X	—	—	
Palo Alto ..	California 122° 07' 30" W. 37° 28' 00" N. ⁵	KWT	—	Federal Telegraph Co.	300, 600, 3,100, 3,700 4,300, 4,650 5,850, 7,775	PR ..	X	—	—	
Paris ..	Texas 33° 40' 00" N. 95° 35' 00" W.	WTK	150	Paris Radio Electric Co.	360	PR ³⁰ ..	1000 to 1700 1900 to 2200	—	—	
Parkesburg ..	Pennsylvania	XW	—	—	375, 2,500 (variable) 300, 600	—	—	—	—	
Paris Island ..	South Carolina 32° 21' 00" N. 80° 40' 22" W.	NAV	100	C. D. Tuska Co...	360	O ..	N	—	—	
Pasadena ..	California	KDYR	25	Pasadena Star - News Publishing Co.	360	PR ³⁰ ..	X	—	—	
Pasadena ..	California 118° 03' 03" W. 34° 12' 59" N.	KLB	20	J. J. Dunn & Co.	300, 360, 600 (c.w.)	PR ..	X	—	—	
Pasadena ..	California	XI	—	Samuel G. McMeen, 683, South Los Robles Avenue	200, 375 (variable)	—	—	—	—	

Pedrocityas	California, Santa Catalina	KUXV	50	Pacific Telephone and Telegraph Co.	300, 350, 400, 450, 500, 600 (c.w.)	P R	0700 to 2300		
Pensacola	33° 20' 15" N. 118° 28' 40" W. Florida	NAS	300	Navy	300, 600, 1,800	— 230	N	—	—
Peoria	30° 20' 53" N. 87° 16' 10" W. Illinois	YAN	—	Bradley Polytech- nic Institute, Institute Place Navy	200, 375	—	—	—	—
Philadelphia NAI	Pennsylvania	NAI	300	—	600	O	N	—	—
Philadelphia WHE	39° 52' 18" N. 75° 11' 46" W. Pennsylvania	WHE	100	John Wanamaker	300, 600, 1,700	P R	0900 to 1800	—	—
Philadelphia	39° 57' 06" N. 75° 00' 44" W. Pennsylvania	WCAU	—	Philadelphia Radiophone Co.	360	P R ³⁹	X	—	—
Philadelphia	39° 57' 06" N. 75° 09' 44" W. Pennsylvania	WDAR	25	Lit Brothers, Eight and Market Streets	360	P R ³⁹	X	—	—
Philadelphia	39° 53' 20" N. 75° 10' 50" W. Pennsylvania	WFI	50	Strawbridge & Clothier	360	P R ³⁷	1930 to 2130	—	—
Philadelphia WGL	39° 57' 00" N. 75° 08' 00" W. Pennsylvania	WGL	100	—	250 (c.w.)	— 39	X	—	—
Philadelphia	39° 57' 00" N. 75° 08' 00" W. Pennsylvania	WHE	—	John Wanamaker	300, 600, 1,700	P R	0900 to 1800	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	WIP	100	Gimbel Bros.	360	P R ³⁹	1200 to 1300 1900 to 2000 Monday, Wednesday, and Saturday	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	WOO	—	John Wanamaker	360	P R ³⁹	1000 to 1700 1900 to 2200	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	XAG	—	Westinghouse Elect. & Mfg. Co., 214, North Twenty-second Street	200, 250	—	—	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	XB	—	Philadelphia Elect. Co., 1,000, Chest- nut Street	250, 275	—	—	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	XC	—	Frederick Strati- nor, 1,638, North Redfield Street	400, 425 275, 1,500	—	—	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	XK	—	—	200, 250 Variable	—	—	—	—
Philadelphia	79° 05' 44" W. 39° 57' 06" N. Pennsylvania	XV	—	—	360	P R ³⁹	X	—	—
Phoenix	33° 20' 15" N. 118° 28' 40" W. Arizona	KDYW	50	Smith, Hughes & Co.	510 (c.w.)	— 39	X	—	—
Pine Bluff	33° 20' 15" N. 118° 28' 40" W. Arkansas	WOK	50	—	—	—	X	—	—
Pittsburgh	33° 20' 15" N. 118° 28' 40" W. Pennsylvania	WCAE	—	Kaufman & Baer Co., Sixth and Smithfield Sts.	360	P R ³⁹	X	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres—the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Pittsburgh ..	Meridian of Greenwich. Pennsylvania 40° 20' 00" N. 80° 20' 00" W. Pennsylvania	KQV	200	Double-Hill Elect. Co.	200, 425	P R ²⁹ ..	X	—	—	
Pittsburgh ..		XW	—	Radio Electric Co., 1,427 Liberty Avenue	Variable	—	—	—	—	
Pittsburgh ..	Pennsylvania	XX	—	Duquesne University	200, 375	—	—	—	—	
Pittsburgh ..	Pennsylvania	XY	—	West Penn. Power Co.	Variable	—	—	—	—	
Point Arguello ..	California 34° 34' 35" N. 119° 12' 30" W. S. Pedro, Calif.	NPK	—	Government ..	300, 600, 1,500	D F ..	—	—	—	
Point Fermin ..	S. Pedro, Calif. 32° 42' 19" N. 118° 17' 38" W.	NPX	100	U.S. Navy ..	800	D F ..	N	—	—	
Point Hueneme ..	Hueneme, Calif. 34° 08' 43" N. 119° 12' 30" W.	NMD	100	U.S. Navy ..	800	D F ..	N	—	—	
Point Isabel ..	Texas 26° 04' 10" N. 97° 12' 33" W.	NAY	300, 1,000	Navy ..	600, 975, 2,250 ⁸⁰ , 2,350 ⁸ , 2,400, 3,950, 5,000	P G ²⁰ ..	N	0.30	—	
Point Loma ²² ..	S. Diego, Calif. 32° 42' 21" N. 117° 15' 17" W. Calif. S. Francisco Entrance	NPL	100	U.S. Navy ..	800	D F ..	N	—	—	
Point Montara ..	37° 32' 02" N. 122° 31' 07" W. California	NLH	100	U.S. Navy ..	800	D F ..	N	—	—	
Point Reyes ..	122° 40' 45" W. 37° 54' 30" N. Calif. S. Francisco Entrance	KDU	4,000	Radio Corporation of America	300, 600, 12,100	P R ²⁹ ..	N	—	—	
Point Reyes..	38° 02' 12" N. 123° 50' 26" W.	NLG	100	—	800	D F ..	—	—	—	

	4301				300 (C.W.V.)		300 (C.W.V.)		
Port Angeles 48	42° 00' 00" W. 34° 00' 00" N. ¹⁵	NFT	—	U.S. Navy	800	DF ..	N	—	—
Port Arthur	48° 08' 30" N. 123° 24' 19" W. Texas	NJY	150	U.S. Navy	600, 975, 1,620	PG ..	N	0.30	—
Port Arthur	29° 52' 46" N. 93° 55' 35" W.	XV	—	Louis W. Hatry, 2048, Fifth Street	200, 225, 250 (variable) 800	—	—	—	—
Port Eads ..	Mississippi River Entrance	NBX	—	—	—	DF ..	X	—	—
Port Eads ..	29° 00' 50" N. 89° 09' 33" W. Louisiana	WZH	110	U.S. Army (Signal Corps)	600, 1,100	O ..	N	—	—
Port Eads ..	89° 09' 32" N. 29° 00' 43" W. Michigan	NBX	800	U.S. Army	—	DF ..	N	—	—
Port Huron ..	82° 25' 33" W. 42° 47' 33" N. Oregon	KDPJ	150	Radio Corporation of America	300, 400, 600, 1,625	PR ..	X	—	—
Portland ..	122° 40' 43" W. 45° 31' 06" N. Oregon	KDYQ	200	Oregon Institute of Technology	485	PR ²⁹ ..	X	—	—
Portland ..	122° 40' 43" W. 45° 31' 06" N. Oregon	KGG	100	Hallock and Watson Radio Service	360	PR ²⁹ ..	1600 to 2200	—	—
Portland KGN	122° 45' 00" W. Oregon	KGN	150	North - Western Radio Mfg. Co.	360	PR ²⁹ ..	1600 to 1800 1900 to 2200	—	—
Portland ..	45° 30' 54" N. 122° 38' 46" W. Oregon	KGW	100	Oregonian Publish- ing Co.	360	PR ²⁹ ..	1000 to 7000 1930 to 2130 1930 to 2130	—	—
Portland ..	Oregon	KQY	50	Stubb Electric Co.	360	PR ²⁹ ..	—	—	—
Portland ..	122° 45' 00" W. 45° 30' 00" N. ¹⁵ Oregon	KYG	100	Willard P. Hawley, Jr.	360	PR ²⁹ ..	0430 to 0530 1900 to 2200	—	—
Portland ..	122° 40' 44" W. 45° 31' 39" N. Maine	NAB	300	U.S. Navy	300, 600, 975, 200, 375 (variable)	O ²⁹ ..	N	—	—
Portland ..	43° 33' 54" N. 70° 12' 08" W. Oregon	XI	—	Hallock and Watson Radio Service, 192, Park Street	250-1,650	—	—	—	—
Portland ..	Oregon	XL	—	North - Western Electric Co.	—	—	—	—	—
Portland ..	Oregon	WDAB	—	H. C. Summers & Co.	360	PR ²⁹ ..	X	—	—
Portsmouth ..	Ohio	NAC	300	U.S. Navy	600	O ..	N	—	—
Portsmouth ..	New Hampshire 43° 04' 33" N. 70° 44' 00" W.								

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service	Coast Charge, France.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Port Townsend	Meridian of Greenwich. Washington 122° 46' 02" W. 48° 07' 01" N.	KRP	300	Port Townsend Radio Co.	300, 600	P G	—	—	—	
Port Royal	South Carolina 32° 30' 00" N. 80° 42' 00" W.	NAV	100	U.S. Navy	300, 600	O	N	—	—	
Poyners Hill	N.C. 36° 17' 10" N. 75° 48' 00" W.	NCZ	100	U.S. Navy	800	D F	N	—	—	
Price's Neck	Rhode I. 41° 27' 06" N. 71° 20' 15" W.	NAF	100	U.S. Navy	800	D F	N	—	—	
Princeton	Indiana 38° 17' 00" N. 87° 29' 00" W.	WJAV	200	Indian Pipe Line Corp.	1,625	P	X	—	—	
Puget Sound	Washington 122° 37' 03" W. 47° 41' 46" N.	NPC	300-2,000	U.S. Navy	600, 2,500	O	N	—	—	
Quantico	Virginia 38° 31' 35" N. 77° 17' 15" W.	NFV	—	U.S. Navy	507, 600	O	N	—	—	
Quincy	Massachusetts 42° 14' 16" N. 70° 58' 39" W.	KDGU	200	Bethlehem Ship-Building Corp.	300, 600, 1,985	— ³⁸	X	—	—	
Quincy	Illinois 91° 23' 00" W. 39° 56' 00" N.	WCAW	—	Quincy Herald and Quincy Electric Supply Co.	360	P R ³⁹	X	—	—	
Quincy	Illinois 91° 23' 00" W. 39° 56' 00" N.	WCAZ	100	Robert E. Comp-ton and Quincy Whig General Company	360	P R ³⁹	X	—	—	
Rainbow	Montana 47° 35' 00" N. ⁴ 111° 10' 00" W.	KLQ	200	Great Falls Power Company	500, 1,700	— ³⁹	X	—	—	
Raleigh	North Carolina	YC	—	North Carolina State College (Electrical Engineering Dept.)	200, 375	—	—	—	—	
Raleigh	North Carolina 38° 20' 45" N.	WLAC	300	North Carolina State College	500	P	X	—	—	

Station	Keet	Light Vessel No.	NAKA	100	South Dakota School of Mines General Petroleum Corporation of California	300, 600	P G	N	
Kam Island	WCAT	150	South Dakota School of Mines General Petroleum Corporation of California	485	P R ³⁹ ..	X	
Light Vessel No. 23	KDIB	200	General Petroleum Corporation of California	425	— ³⁹	X	
Rapid City	NAH	—	Donald B. Heilman, 54, South Sixth Street	200	—	—	
Rawlins	KDYN	150	Great Western Radio Corp.	360	P R ³⁹ ..	X	
Reading	KMC	50	Lindsey-Weatherall & Co.	360	P R ³⁹ ..	2000 to 2100	
Redwood City	NAJC	—	U.S. Navy	300, 600	— ⁷	N	
Redley	NTR	—	U.S. Navy	300, 600	— ⁷	N	
Relief Lightship No. 53	NITS	—	U.S. Navy	300, 600	— ⁷	N	
Relief Light Vessel No. 78	KDEK	150	U.S. Post Office Department Nevada Machinery & Electric Co.	2,200, 2,800	— ¹	0200 to 1800 ⁴⁶	
Relief Light Vessel No. 90	KDZK	150	Ridgewood Times Printing and Publishing Co.	360	P R ³⁹ ..	X	
Reno	WHN	30	—	360	P R ³⁹ ..	1930 to 2130	
Ridgewood	WOZ	100	Palmer School of Chiropractic	360, 485 c.w.	— ³⁹	X	
Richmond	WHQ	100	—	300, 485 (c.w.)	— ³⁹	X	
Rochester	WOC	200	Swans Island and Rockland Radio Communication Service	360, 485 (c.w.)	— ³⁹	X	
Rock Island	WME	300	East Coast Fisheries Co.	300, 425, 600	P R ³⁹ ..	X	
Rockland	WST	300	Post Office U.S. Army	300, 450, 600, 1,800	P G ..	N	0.50
Rockland	KDHN	—	Michigan Lime-stone and Chemical Co.	2,900, 3,200	O .. ²	0300 to 1900 ⁴⁵	
Rock Springs	WYH	—	Société Industrielle de TSF	300, 360, 600	P R ³⁹ ..	1900 to 2400	
Rockwell Field	WCAF	300	—	360, 485	—	—	
Rogers	WDY	100	Navy	300, 360, 600 (c.w.)	P R ..	X	
Roselle Park	—	—	—	300, 600	—	N	0.30
Roswell	KVQ	—	—	360, 485	—	—	
Sacramento	NAP	300	—	300, 360, 600 (c.w.)	P R ..	X	
St. Augustine	—	—	—	300, 600	P G ..	N	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Saint James..	Meridian of Greenwich. New York 72° 56' 30" W. 40° 55' 45" N.	WQK	4,000	Radio Corporation of America	16,465	P G ..	N	—	—	
St. Joseph ..	Missouri 94° 51' 00" W. 39° 49' 00" N.	WEAK	450	Julius B. Abercrombie, 819, North Twenty-third Street	360	P R ³⁹ ..	X	—	—	
St. Louis ..	Missouri 90° 12' 17" W. 38° 38' 03" N.	KSD	100	Post Dispatch ..	360	P R ³⁹ ..	1000 to 2200 (intermittently)	—	—	
St. Louis ..	Missouri 90° 13' 58" W. 38° 38' 17" N.	WEW	150	St. Louis University	485	P R ³⁹ ..	X	—	—	
S. Louis ..	Missouri 90° 15' 00" W. 38° 38' 00" N.	KDEL	500	Post Office Dept.	1,300	O ..	X	—	—	
St. Louis, WYDA ..	Missouri 90° 15' 00" W. 38° 38' 00" N.	WYDA	500	Inland and Coastwise Waterways Service War Dept.	600, 756, 952, 1,200, 1,500, 1,900	O ..	0800 to 1700	—	—	
St. Louis ..	Missouri	WCK	—	Boy Scouts of America	360, 485	—	—	—	—	
Saint Paul ..	Minnesota	ZAH	—	Navy ..	200, 375	—	—	—	—	
St. Petersburg ..	Florida 82° 38' 00" W. 27° 46' 15" N.	NGL	300, 600	..	600, 975, 2,400, 2,700 ³⁹ , 3,700, 3,950	O ..	N	—	—	
Salt Lake ..	Utah	KDEH	—	Post Office Dept.	2,200, 3,600	— ²	0300 to 1900 ⁴³	—	—	
Salt Lake City ..	Utah	KDYL	—	Telegraph Publishing Co.	360	P R ³⁹ ..	X	—	—	
Salt Lake City ..	Utah	KDYV	25	Cope & Cornwell Co., 1138, Michigan Av.	360	P R ³⁹ ..	X	—	—	
Salt Lake City ..	Utah	ZV	—	Julian G. McCollom, 1,922, South Tenth E. Street	200, 375	—	—	—	—	
San Antonio..	Texas 90° 28' 00" W. 29° 27' 00" N.	WCAR	75	Alamo Radio Electric Co., 608, West Evergreen Street	360	P R ³⁹ ..	X	—	—	

San Antonio	Texas	XY	Alamo Radio Electric Co., 608, West Evergreen Street	Variable 200 to 375	—	—	—
San Diego ..	California	KDYM	Savoy Theatre, 236, C. Street	360	P R ³⁸ ..	X	—
San Diego ..	California 117° 10' 00" W. 32° 43' 00" N.	KDYO	Carlson & Simpson, Union and C. Streets	360	P R ³⁸ ..	X	—
San Diego, KEN ..	California 32° 42' 26" N. 117° 14' 40" W.	KEN	A. E. Banks ..	300, 450, 600	P R ..	X	—
San Diego, KVV ..	California 117° 14' 49" W. 32° 14' 49" N.	KVV	Boulevard Express	300, 600, 1,610 (c.w.)	— ³⁸	X	—
San Diego, NPL ..	California 117° 14' 49" W. 32° 14' 49" N.	NPL	Government ..	300, 600, 1,000, 1,800, 2,000, 2,400, 9,800	P G ..	N	0.30
San Diego ..	Porto Rico 69° 53' 15" W. 18° 27' 43" N.	NJG	U.S. Navy ..	1,988 600	D F ..	N	—
San Domingo ..	New Jersey 40° 27' 54" N. 73° 59' 50" W.	NAH	U.S. Navy ..	800	D F ²⁸ ..	N	—
Sandy Hook ..	California	KDN	—	360, 485, (c.w.)	P R ..	X	—
S. Francisco KDN	California	KDZG	Cyrus Peirce & Co., 433, California Federal Telegraph Co.	360	P R ³⁸ ..	X	—
S. Francisco ..	California	KFS	John P. Hickey The Emporium ..	300, 600, 1,800	P G ..	N	0.30
S. Francisco KFS ..	California 122° 30' 06" W. 37° 49' 36" N.	KHH	Examiner Printing Company	300, 570, 600	P R ..	X	—
S. Francisco KHH ..	California	KSL	—	360	P R ³⁸ ..	X	—
S. Francisco KUO ..	California	KUO	U.S. Navy ..	300, 525, 600 (c.w.)	P ³⁸ ..	X	—
S. Francisco KYY ..	California	KYY	—	300, 360, 600 (c.w.)	P R ..	X	—
S. Francisco ..	California 112° 22' 52" W. 37° 30' 18" N.	NPG	Navy ..	2,400, 4,800 17,145	O ..	N	—
S. Francisco ..	California 38° 05' 03" N. 122° 13' 56" W.	NPH	—	600, 1,000, 2,500	—	—	—
S. Francisco WVV ..	California	NPH	War Dept. Wilson McGuire Co., 1,004, Treat Avenue	Variable	—	—	—
S. Francisco WVV ..	California	XAU	Radio Corporation of America	Variable	—	—	—
S. Francisco ..	California	XX	—	1,000	—	—	—
S. Francisco Light Vessel	California 37° 45' 05" N. 122° 41' 32" W.	NAKS	—	300, 360, 600 (c.w.)	D F (and Fog Signals) ²¹ P R ..	—	—
S. Jose, California ..	—	KQW	—	—	—	X	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Type).	Nature of Service.	Hours of Service.	Coast Charge. Franes. Per Word.	Mini-mum Charge.	Remarks.
UNITED STATES OF AMERICA—contd.										
San Juan ..	Meridian of Greenwich. Porto Rico. 66° 05' 40" W. 18° 28' 03" N. Texas	NAU	300, 1,000	U.S. Navy	300, 600, 1,800, 5,250 (c.w.)	P G	N	0.30	—	
San Marcos ..		YT	—	San Marcos High School	200, 375	—	—	—	—	
S. Pedro ..	California 33° 57' 48" N. ^a 118° 22' 35" W.	NPX	300-600	Navy	150, 365, 600, 975, 1,851, 2,400, 2,750, 3,950, 4,525 ³⁰ 300, 450, 600	P G	N	0.30	—	
Savannah NEV ..	Georgia 32° 05' 15" N. 81° 06' 15" W.	NEV	150	Navy	—	O ³⁰	N	—	—	
Savannah WBAL ..	Georgia 81° 06' 15" W. 32° 05' 15" N.	WBAL	150	United States Shipping Board	300, 450, 600	P R	X	—	—	
Savannah Sayville ..	Georgia Long Island 40° 44' 36" N. 73° 06' 12" W.	XB NDD	— 300	Navy	280, 375 9,145, 10,510	— O	— N	— —	— —	
Schenectady ..	New York 73° 55' 42" W. 42° 49' 00" N.	WRL	200	Union College	360	P R ³⁰	X	—	—	
Schenectady ..	New York 73° 54' 30" W. 42° 50' 00" N.	WGY	200	—	360, 485	— ³⁰	X	—	—	
Schenectady ..	New York	XQ	—	—	250, 1,500	—	—	—	—	
Scott Field ..	Illinois (Belleville)	WYF	—	U.S. Army	—	O	—	—	—	
Scranton ..	Pennsylvania	ZAB	—	Shotten Mfg. Co.	1,000	D F ²¹	—	—	—	
Sea Girt Lighthouse ..	New Jersey 40° 08' 19" N. 74° 01' 27" W.	—	—	—	—	—	—	—	—	
Seattle KFC ..	Washington	KFC	—	—	300, 360, 600 (c.w.)	— ³⁰	X	—	—	
Seattle KFL ..	Washington	KFL	—	Garrison Babcock	200, 300, 340, 600 (c.w.)	P R	X	—	—	

Seattle KHQ	Washington 122° 22' 15" W. 47° 38' 25" N.	KHQ	50	—	360 (c.w.)	— ²⁹	X	—
Seattle KJR	Washington 112° 18' 24" W. 47° 43' 40" N.	KJR	20	Vincent I. Kraft	360	PR ²⁸ ..	X	—
Seattle ..	Washington 47° 37' 00" N. 122° 20' 00" W.	KPE	—	Government	300, 450, 550, 600	PR ..	N	—
Seattle KVV ¹²	Washington 122° 20' 00" W. 47° 37' 00" N.	KVW	200	Light Department, Seattle (Wash- ington)	300, 450, 550, 600 (c.w.)	PR ..	X	—
Seattle NVL	Washington 47° 37' 00" N. 122° 20' 00" W.	NVL	200	Navy	600, 700, 1,988, 2,400	PG ^{23 14}	N	0.30
Selfridge Field	Michigan (Mount Clemens)	WVE	—	Government	—	—	—	—
Shock ..	Kentucky 39° 50' 00" N. ⁸ 82° 13' 00" W.	WAAI	150	Sullivan Pond Creek Co.	1,610 (c.w.)	PR ..	X	—
Shreveport ..	Louisiana	WAAG	—	341, Liatre Street	—	—	—	—
Shreveport ..	Louisiana	WDAN	25	Glenwood Radio Corp., Centen- ary College	360	PR ²⁸ ..	X	—
Siasconset NBS	Massachusetts, Nantucket Islands 69° 58' 19" W. 41° 15' 50" N.	NBS	150	—	300, 600, 1,610	O ¹ ..	N	—
Siasconset ..	Massachusetts	WSC	—	Radio Corporation of America	300, 450, 600, 1,610	PG ..	X	—
Skagit Power Site	Washington 121° 15' 00" W. 48° 40' 00" N. ⁵	WJE	200	Light Department, Seattle (Wash- ington)	300, 450, 550, 600 (c.w.)	PR ..	X	—
Slip Point ..	Washington ⁵⁷ 48° 15' 32" N. 124° 15' 25" W.	NPD	100	U.S. Navy	800	DF ¹⁸ ..	N	—
Smith Island ⁴⁸	Washington 48° 18' 54" N. 122° 51' 32" W.	NFH	100	—	800	DF ..	— ²⁴	—
South Pasadena	California	XAS	—	Brooke E. Sawyer, 456, South Spring Street, Los Angeles	200, 260, Variable	—	—	—
Spokane ..	Washington 117° 25' 00" W. 47° 40' 00" N. ⁵	KFZ	—	Doerr - Mitchell Electric Co.	360	PR ²⁸ ..	1900 to 2100	—
Springfield ..	Massachusetts 72° 33' 08" W. 42° 08' 30" N.	WBZ	500	Westinghouse Electric Mfg. Co.	500	— ²⁹	X	—
Springfield ..	Illinois 89° 58' 34" W. 39° 49' 00" N.	WDAC	450	Illinois Watch Co Ninth and North Grand Avenue	485	PR ²⁸ ..	X	—
Springfield ..	Ohio	WNA	200	Ford Motor Co. ...	465 (c.w.)	— ²⁹	X	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres—(the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Springfield ..	Meridian of Greenwich, Ohio	XAK	—	Wittenberg College	200, 375	—	—	—	—	
Springwells ..	Michigan 83° 13' 30" W. 42° 18' 00" N.	WPZ	100	Ford Motor Co. . .	300, 480, 520, 600 (c.w.)	P R ..	X	—	—	
Stanford University	California	XH	—	Herbert Hoover, Jr.	—	—	—	—	—	
State College ..	Pa.	XAI	—	Pennsylvania State College	200, 375	— ³⁹	X	—	—	
Stockton KJQ ..	California	KJQ	—	—	300, 360, 600 (c.w.)	P R ..	X	—	—	
Stockton KWG ..	California	KWG	—	—	300, 360, 600 (c.w.)	P R ..	X	—	—	
Sugarland ..	Texas	KDLY	500	Sugarland Industries	300, 375, 425, 600	— ³⁹	X	—	—	
Sunnyvale ..	California	KJJ	—	—	300, 360, 600 (c.w.)	P R ..	X	—	—	
Sunnyvale ..	California	ZAD	—	—	—	—	—	—	—	
Superior ..	Michigan 83° 38' 27" W. 42° 15' 44" N.	KDPI	40	Detroit-Edison Company	300, 500, 600, 1,625	P R ..	X	—	—	
Surfside ..	Nantucket, Mass. 41° 14' 42" N. 70° 05' 56" W.	NBS	100	U.S. Navy ..	800	D F ..	N	—	—	
Swans Island ..	Maine 68° 27' 00" W. 44° 10' 00" N. ⁵	WTI	100	Swans Island and Rockland Radio Communication Service	300, 425, 600	P R ³⁹ ..	X	—	—	
Syracuse ..	New York	WDAI	100	Hughes Electrical Corporation	360	P R ³⁹ ..	X	—	—	
Tarrytown ..	New York 73° 51' 30" W. 41° 04' 40" N.	WRW	—	Tarrytown Radio Research Lab.	360	P R ³⁹ ..	0900 to 2400	—	—	

Station	Lat.	Long.	Alt.	Power	Frequency	Service	Remarks
Tatoosh Island	48° 23' 28" N.	124° 44' 29" W.	450	100	NPD	U.S. Navy	
Tatoosh	48° 23' 31" N.	124° 44' 03" W.	450	450	NPD	Navy	
Terre Haute	88° 39' 00" W.	39° 29' 00" N.	100	100	WEAC	Baines Electric Service Co., 24, South Eighth Street	
Thompson Falls	Montana		—	—	KLL	Thompson Falls Power Co.	
Toledo	Ohio		—	—	WBAJ	—	
Toledo WJK	Ohio		300	300	WJK	—	
Toledo, WHU	Ohio		200	200	WHU	—	
Toledo	Ohio		—	—	WQC	Central States Radio Service	
Tralee	West Virginia		150	150	WCAA	Meade Pocahontas Coal Company	
Troy	81° 24' 00" W.	37° 34' 00" N.	—	—	XAP	Rensselaer Polytechnic Institute	
Tuckerton	New Jersey		4,000	4,000	WGG	Radio Corporation of America	
Tucson	39° 33' 00" N.	74° 23' 00" W.	100	100	KDZA	Arizona Daily Star	
Tulsa	Okla.		—	—	KDGT	Southwestern Wireless Telegraph and Teleph. Co.	
Tulsa	Okla.		—	—	WBAT	Hamilton Oil Corp.	
Tulsa	Okla.		150	150	WEH	Midland Refining Company	
Tacoma	82° 27' 00" W.	112° 27' 54" W.	50	50	KMO	Love Electric Co.	
Tacoma	47° 15' 38" N.	Washington	—	—	YO	Tacoma City College	
Taft	California		90	90	WJK	—	
Tallahassee	Georgia		—	—	ZG	Georgia Railway and Power Co.	
Tampa	Florida		100	100	WDAE	Tampa Daily Times	
Tampa	Florida		300	300	WPD	George C. Warner (Junior)	
Tampa	Florida		—	—	XJ	Thompson Electric Co., 102, W. Lafayette St.	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
Tampa	Meridian of Greenwich, Florida	XG	—	Pierce Electric Co.	Variable	—	—	—	—	
University Place ..	Nebraska 96° 42' 20" W. 45° 49' 00" N.	WCAJ	50	Nebraska Wesleyan University	360, 485	P R ²⁵ ..	X	—	—	
Urbana	Illinois 88° 15' 00" W. 40° 07' 00" N.*	WRM	100	University of Illinois	360, 410 (c.w.)	P R ..	Local time 1900 to 2200	—	—	
Urbana	Illinois	XJ	—	—	375, Variable	—	—	—	—	
Utica	New York	WSL	—	J. & M. Electric Co.	360	P R ²⁵ ..	1000 to 1800	—	—	
Vancouver	Washington	ZJ	—	Royal Mumford..	—	—	—	—	—	
Vermilion	South Dakota	WEAJ	—	University of South Dakota	360	P R ²⁵ ..	X	—	—	
Villanova	Pennsylvania 75° 20' 03" W. 40° 02' 30" N.	WCAM	150	Villanova College	360	P R ²⁵ ..	X	—	—	
Virginia Beach ..	Va. 36° 51' 09" N. 75° 58' 34" W. ² District of Columbia	NCZ	—	U.S. Navy	800	D F ..	N	—	—	
Washington NAA ..	38° 52' 05" N. 77° 04' 47" W. District of Columbia	NAA	1,000 1,500	Navy	2,500 ^{8 29 33 36 12}	— ²⁹	N	—	—	
Washington	76° 59' 46" W. 38° 52' 22" N. District of Columbia	NAL	300 1,000	U.S. Navy	600	O ..	N	—	—	
Washington WDN ..		WDN	—	—	300, 360, 600 (c.w.)	— ²⁹	1000 to 1230 1900 to 2130	—	—	
Washington	District of Columbia	WIL	—	Continental Electrical Supply Co.	360	P R ²⁵ ..	1930 to 2130 Monday and Wednesday	—	—	

Washington ..	..	District of Columbia	WMU	—	Douglas-Hill Electric Co.	360	P R ²⁵ ..	1630 to 1730 Monday, Wednesday and Friday	—
Washington ..	..	District of Columbia	WPM	75	Thomas J. Williams	360	P R ²⁵ ..	1200 to 1300 Friday	—
Washington WJH ..	..	District of Columbia	WJH	—	—	300, 360, 600 (c.w.)	P R ..	1930 to 2130 Monday X	—
Washington ..	..	District of Columbia	XAF	—	Elliott Woods, The Capitol	700, 1,100, 2,500	—	—	—
Washington ..	..	District of Columbia	XD	—	Central High School	200, 375	—	—	—
Washington ..	..	Pennsylvania	XG	—	Washington and Jefferson College	200, 375	—	—	—
Washington ..	..	District of Columbia	XZ	—	—	175, 200, 260, 330	—	—	—
Washington ..	..	District of Columbia	YS	—	George Washington University 2023, G. Street, N.W.	200, 375	—	—	—
Waterbury ..	..	Connecticut	XT	—	Bristol Co. ..	360	—	—	—
Wenatchee ..	..	Washington 120° 19' 00" W. 47° 25' 12" N.	KDZI	100	Electric Supply Co.	360	P R ²⁵ ..	X	—
Wenatchee ..	..	Washington	KZV	—	Wenatchee Battery & Motor Co.	360	P R ²⁵ ..	X	—
Westport ²⁵ ..	..	Washington 46° 53' 19" N. 124° 07' 20" W.	NHL	100	—	800	—	—	—
Whitefish Point ..	..	Michigan 46° 46' 18.85" N. 84° 57' 21.99" W.	NZT	100	U.S. Navy ..	800	DF ²⁵ ..	N	—
Wichita ..	..	Kansas	WEAH	—	Wichita Board of Trade & Lander Radio Co.	360, 485	P R ²⁵ ..	X	—
Wichita ..	..	Kansas 96° 08' 00" W. 32° 30' 00" N. ⁵	WEY	150	Cosradio Co. ..	360, 485	P R ²⁵ ..	X	—
Wichita Falls ⁴⁵ ..	..	Texas 33° 54' 00" N. ⁵ 98° 22' 00" W.	KUXQ	150	Continental Radio Telegraph & Telephone Co.	1,750	— ²⁵	N	—
Winthrop ..	..	Massachusetts 98° 22' 00" W.	XQ	—	Lloyd C. Greene, 88, Somerset Avenue	Variable	—	—	—
Worcester ..	..	Massachusetts 71° 49' 00" W. 42° 15' 00" N. ⁵	WDAS	50	Samuel A. Waite, 49, Benefit St.	360	P R ²⁵ ..	X	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs. Per Word.	Remarks.
UNITED STATES OF AMERICA—contd.									
Worcester ..	Meridian of Greenwich. Massachusetts 71° 49' 00" W. 42° 15' 00" N. ^a	WDAT	200	Delta Electric Co., 658, Main Street	360	P R ³⁹ ..	X	—	
Worcester ..	Massachusetts 71° 49' 35" W. 42° 14' 53" N.	WCN	150	Clark University	360, 485	P R ³⁹ ..	1930 to 2130	—	
Worcester ..	Massachusetts	XS	—	Otis C. White, 17, Herman Street	Variable	—	—	—	
Yakima ..	Washington 126° 36' 00" W. 40° 30' 00" N. ^a	KFV	150	Foster - Bradbury Radio Store	360	P R ³⁹ ..	1200 to 2200	—	
Yakima ..	Washington 120° 30' 00" W. 47° 30' 00" N.	KQT	50	Electric Power & Appliance Co.	360	P R ³⁹ ..	1000 to 2200	—	
Youngstown ..	Ohio	WMC	150	Columbia Radio Co.	360	P R ³⁹ ..	2030 to 2145	—	
ALASKA									
Akutan KMW	Aleutian Islands 54° 08' 00" N. ^a 165° 48' 00" W.	KMW	150	North Pacific Sea Products Co.	300, 450, 600	P R ¹ ..	X	—	¹ Fixed Station ² Approximately ³ Hydrographic informa- tion broadcasted at 0800, 1200, 1600, 2000 ⁴ Permanently moored vessel ⁵ Continuous watch is kept during thick weather
Akutan KTK	—	KTK	—	Bureau of Educa- tion, Dept. of the Interior Alaska Packers Association	—	O ..	X	—	
Alitak ..	Kodiak Island 59° 04' 00" N. 158° 14' 00" W. ^a	KYL	75	Alaska Packers Association	300, 500, 600	P R ..	X	—	
Becharof ..	58° 16' 00" N. ^a 157° 23' 00" W.	KUDV	200	Alaska Packers Association	300, 500, 600	P R ..	X	—	
Bethel ..	—	WVI	—	Government ..	—	—	—	—	
Birmingham ..	86° 49' 00" W. 33° 30' 00" N.	WSY	100	Alabama Power Co.	360	P R ¹ ..	1430 except Sun- day and 2000 every day	—	
Birmingham ..	—	XAG	—	Mathews Electrical Supply Co.	200, 375	—	—	—	

Cape Edwards	KEY	150	Deep Sea Salmon Co.	300, 550, 600	P.R.	X
57° 42' 00" N. ² 137° 15' 00" W.						
Cape Hinchinbrook..	NRM	100	Navy ..	800	D.F.	N ^s
60° 14' 00" N. 146° 38' 54" W.						
Carlisle ..	—	300	—	—	—	—
156° 48' 00" W.						
Chichagof ..	KRX	—	Chichagof Mining Co.	300, 550, 600	P.R.	X
59° 02' 00" N. —						
Chignik KHC	KHC	300	Alaska Packers Association	300, 600, 1,600	P.R.	April to October X
Alaska Peninsula 56° 17' 30" N. 158° 31' 30" W.						
Chignik KNP	KNP	300	Columbia River Packers Association	300, 525, 600, 1,650	P.R. ¹	X
158° 23' 00" W. 56° 17' 00" N. ²						
Chisik Is. ..	KUCP	300	Surf Packing Co.	300, 550, 600, 1,650	— ¹	X
60° 10' 00" N. ² 152° 25' 00" W.						
Circle ..	WVA	150	U.S. Signal Corps	1,350	P.G.	0800 to 2000
65° 49' 12" N. 144° 04' 18" W.						
Clark's Point	KHG	200	Alaska Packers Association	300, 400, 500, 600	— ¹	X
Bristol Bay 58° 50' 45" N. 158° 31' 45" W.						
Cordova ..	NPA	300, 2,000	U.S. Navy ..	300, 600, 1,800, 5,750, 7,100, 7,500 (c.w.)	P.G.	N 0.30
Prince William Sound 60° 28' 30" N. 145° 25' 30" W.						
Craig ..	WXO	150	U.S. Signal Corps	600	— ¹	0800 to 2000
55° 22' 00" N. ² 133° 15' 00" W.						
Daly ..	KDJT	150	Alaska - Portland Packers Association	300, 500, 600	— ¹	X
158° 32' 30" W. 58° 59' 00" N.						
Dutch Harbour	NPR	300	U.S. Navy ..	300, 1,800 (c.w.)	P.G. ^s	N 0.30
Aleutian Islands Unalaska 53° 53' 14" N. 166° 33' 02" W.						
Egegik ..	KMF	300	Libby, McNeill & Libby	300, 500, 600	— ¹	X
58° 16' 00" N. ² 157° 16' 00" W.						
Elauk ..	KMG	300	Libby, McNeill & Libby	300, 500, 600	— ¹	X
56° 49' 00" N. ² 156° 30' 00" W.						
Fairbanks ..	WVB	200	U.S. Signal Corps	1,500	P.G.	0800 to 2000
64° 50' 17" N. ² 147° 42' 21" W.						
False Pass ..	KJL	200	P. E. Harris & Co.	300, 525, 600, 2,000	—	0700 to 2200
55° 08' 00" N. ² 162° 55' 00" W.						
Fort Egbert	WVC	200	U.S. Signal Corps	1,500	P.G.	0800 to 2000
Eagle 64° 46' 19" N. 141° 13' 48" W.						
Fert Gibbon	WVD	250	U.S. Signal Corps	2,000	P.G.	0800 to 2000
141° 13' 48" W. 65° 10' 16" N. 152° 05' 21" W.						
Fort Morgan	WTO	—	Tropical Radio Telegraph Co.	300, 450, 600, 1,700	P.R.	X

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres—(the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA (ALASKA)—contd.										
Fort St. Michael	Meridian of Greenwich. 63° 20' 15" N. 162° 00' 18" W.	WVE	220	U.S. Signal Corps	300, 600	PG	Local Time, 0900 to 2100	—	—	
Fort Yukon	66° 30' 00" N. 145° 40' 00" W.	WXX	150	U.S. Signal Corps	300, 600 , 1,050	PG	0800 to 2000	—	—	
Funter	57° 00' 00" N. 135° 00' 00" W.	KXK	—	Thinket Packing Co.	300, 550, 600	— ¹	X	—	—	
Hawk Inlet	58° 05' 00" N. 134° 45' 00" W.	KKAI	150	P. E. Harris & Co.	300, 550, 600	— ¹	X	—	—	
Holy Cross	62° 10' 00" N. 160° 00' 00" W.	WVK	150	U.S. Signal Corps	600	PG	0800 to 2000	—	—	
Hyder	55° 40' 00" N. 130° 10' 00" W.	KDFA	200 300	Hyder Townsite & Improvement Co.	300, 550, 600 , 1,610 ¹	PG	X	0.30	—	
Iditarod	62° 40' 00" N. 158° 00' 00" W.	WXL	200	U.S. Signal Corps, War Dept.	300, 500, 600 , 1,650	PG	X	—	—	
Ikatan	54° 45' 00" N. 163° 30' 00" W.	KXW	100	Pacific American Fisheries	300, 450, 600	PR	X	—	—	
Juneau	58° 18' 35" N. 134° 24' 45" W.	NVD	450	U.S. Navy	600 , 975 , 2,250	PG	N	0.30	—	
Jupiter	80° 05' 02" W. 26° 56' 54" N.	—	—	—	—	—	—	—	—	
Karluk	Kodiak Island 57° 35' 36" N. 154° 25' 06" W.	KYK	25	Alaska Packers' Association	300, 500, 600	— ¹	X	—	—	
Ketchikan	Alexander Archipelago 55° 20' 45" N. 131° 38' 51" W.	NVH	300- 1,000	U.S. Navy	600 , 975 , 1,870, 2,400, 4,525, 5,000	PG	N	0.30	—	
King Cove	Alaska Peninsula 55° 05' 00" N. 163° 20' 00" W.	KJK	250	Pacific American Fisheries Co.	300, 450, 600 , 1,610	PG & PR	X	0.30	—	

Kodiak	Hood Island Near the town of Kodiak	NPS	500	U.S. Navy	300, 600, 1,800	P G	N	0.30
Kogging KUBX 4.	57° 46' 45" N, 152° 21' 45" W.	KUBX	20	Alaska Packers Association	300, 400, 600	— ¹	X	—
Kogging	58° 45' 00" N, 156° 42' 00" W.	KVW	300	Libby, McNeill & Libby	300, 450, 600, 1,600	P R	X	—
Kussilof	58° 52' 30" N, 156° 55' 30" W.	KKA0	200	Alaska Packers Association	575, 600, 1,610	— ¹	X	—
Kotlik	60° 24' 00" N, ² 151° 17' 00" W.	WVI	100	U.S. Signal Corps	300, 600	P G	0800 to 2000 Closed October to May	—
Krichak	63° 02' 30" N, 163° 22' 30" W.	KHB	200	Alaska Packers Association	300, 400, 500, 600	— ¹	X	—
Kwiguk Slough	59° 03' 00" N, ² 156° 48' 00" W.	KOV	—	Carlisle Packing Co.	550, 600, 1,610	P R & P G	Closed October to April	—
Latouche	60° 00' 00" N, ² 148° 00' 00" W.	KIM	300	Kenecott Copper Corporation	300, 600, 1,650	P G	1300 to 1700	0.30
Lazy Bay	—	KEPS	—	Alltak Packing Co.	300, 600, 1,600	P R	X	—
Libbyville	59° 00' 00" N, ² 158° 30' 00" W.	KMT	300	Libby, McNeill & Libby	300, 600, 1,700, 2,000	P G	X	0.30
Livengood	148° 32' 18" W.	WUV	300	— ²³	300, 600	P G	X	—
Loakanok	65° 36' 54" N, 59° 05' 45" N.	KML	30	Libby, McNeill & Libby	300, 500, 600, 1,650	P R	X	—
Lost Harbour	54° 15' 00" N, ² 165° 35' 00" W.	KWS	200	Alaska Sulphur Co.	300, 600	— ¹	X	—
Marshall	61° 50' 00" N, 162° 10' 00" W.	KIS	100	John C. Currin	300, 550, 600, 1,650	— ¹	X	—
McGrath	—	WXV	200	U.S. Army	600, 1,000	P G	X	—
Metha Nelson 4	Bristol Bay 58° 45' 00" N, ² 158° 28' 00" W.	KMP	25	Alaska Packers Association	300, 400, 600	— ¹	X	—
Mobile	30° 41' 34" N, 88° 02' 27" W.	NGT	150	U.S. Navy	600, 975, 1,654	P G	N	0.30
Mobile	—	XAE	—	Mobile Radio Co., O'Gwinn Building	200, 375	—	—	—
Nakat Inlet	54° 48' 00" N, ² 131° 41' 00" W.	KDW	100	G. W. Hume & Co.	300, 525, 600, 1,700, 2,000	— ¹	X	—
Naknek KMK	Bristol Bay 58° 43' 30" N, 157° 00' 00" W.	KMK	500	Naknek Packing Co.	300, 500, 600, 1,800	—	April to October X	—
Naknek	—	KHT	—	Alaska Packers Association	300, 600, 1,610	P R	X	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA (ALASKA)—contd.										
Nelson Lagoon ..	Meridian of Greenwich 55° 55' 00" N. ² 160° 50' 00" W.	KXV	100	Pacific - American Fisheries	300, 450, 600	— ¹	X	—	—	
Nixon Fork ..	62° 52' 00" N. ² 155° 30' 00" W.	KDRY	300	Alaska Treadwell Gold Mining Co.	300, 600 , 1,650	— ¹	X	—	—	
Nome ..	Norton Sound 64° 30' 20" N. 165° 23' 38" W.	WVG	500	U.S. Signal Corps	300, 600 , 2,000	PG	November to May, 0800 to 2000 June to October N N	0.25	—	
Noorvik ..	—	WVM	—	Washington-Alaska Military Cable and Telegraph System	1,400	PR	N	—	—	
Nulato ..	64° 43' 30" N. 158° 06' 48" W.	WVH	500	U.S. Signal Corps	1,400	PG	0800 to 2000	—	—	
Nushagak ..	59° 00' 00" N. ² 158° 30' 00" W.	KKAE	300	Libby, McNeill & Libby	300, 600 , 1,600	— ¹	X	—	—	
Pearl Creek Dome ..	156° 04' 00" N. 57° 42' 00" W.	KFU	300	Standard Oil Co. of California	1,700	P	X	—	—	
Pilot Point ..	57° 33' 00" N. ² 157° 30' 00" W.	KUDT	200	Alaska Packers Association	300, 500, 600	— ¹	X	—	—	
Pirate Cove ..	55° 21' 50" N. ² 160° 21' 40" W.	KOXN	500	Union Fish Co.	300, 600 , 1,650	PR	X	—	—	
Port Althorp ..	58° 08' 00" N. ² 136° 15' 00" W.	KLW	250	Deep Sea Salmon Co.	300, 550, 600	PR	X	—	—	
Port Beaulaire ..	56° 18' 00" N. ² 133° 54' 00" W.	KWO	300	Beaulaire Packing Co.	300, 550, 600	PR	X	—	—	
Port Moller ..	55° 50' 00" N. 160° 40' 00" W.	KWR	250	Pacific - American Fisheries	300, 450, 600 , 1,610	PR	X	0.30	—	
Port Walter ..	56° 20' 00" N. 134° 40' 00" W.	KEQ	100	Alaska Herring & Sardine Co.	300, 500, 525, 600	PG & PR	X	0.30	—	

Radioville	..	..	136° 09' 20" W. 57° 36' 30" N.	KWW	200	Joseph T. Bauner	300, 550, 600	P R	..	X	—	—
Ruby 4 (moored vessel)	..	..	58° 50' 00" N. ² 157° 02' 00" W.	KDRH	15	Alaska Packers Association	300, 400, 600	— ¹	—	X	—	—
Saltchuck	..	..	55° 35' 00" N. ² 132° 30' 00" W.	KWQ	100	Saltchuck Mining Company	300, 525, 600, 1,650	— ¹	—	X	—	—
Seldovia	..	..	152° 00' 00" W. 59° 50' 00" N.	KEA	300	Adam Lipke	300, 550, 600	P G	..	Local Time 0900 to 1100 1400 to 1500 1800 to 2000	0.50	—
Seward	..	..	60° 07' 00" N. ² 149° 24' 00" W.	NPV	200	U.S. Navy	600, 1,908	P G	..	N	0.30	—
Sitka	..	..	57° 02' 57" N. 135° 20' 00" W.	NPB	500- 1,000	U.S. Navy	600, 975, 2,400, 2,650, 3,850, 4,600	P G	..	N	0.30	—
Snag Point	..	..	Alexander Archipelago 59° 02' 30" N. ² 158° 27' 15" W.	KHF	200	Alaska Packers Association	300, 400, 500, 600	P R	..	April to October	—	—
Soapstone Point	..	..	58° 06' 10" N. 136° 29' 30" W. ²	NUW	100	U.S. Navy	800	D F	..	N	—	—
St. George	..	..	Pribilof Islands 56° 36' 00" N. ² 169° 43' 00" W.	NPY	100	U.S. Navy	300, 600	P G	..	N	0.30	—
St. Paul	..	..	Pribilof Islands 57° 07' 20" N. 176° 16' 20" W.	NPQ	300- 1,500	U.S. Navy	300, 600, 1,800	P G	..	N	0.30	—
Ugashik	..	..	57° 34' 28" N. ² 157° 35' 00" W.	KMU	200	Red Salmon Cann- ing Co.	300, 500, 600	— ¹	—	X	—	—
Unga	..	..	55° 20' 45" N. 160° 38' 39" W.	KVI	300	Alaska Codfish Co.	300, 600, 1,800	— ¹	—	X	—	—
Uyak	..	..	Kodiak Island 52° 37' 30" N. ² 153° 59' 40" W.	KHA	300	Alaska Packers Association	300, 600, 1,610	— ¹	—	X (April to Oct.)	—	—
Warren	..	..	58° 42' 00" N. 156° 56' 00" W.	KDJU	150	Alaska - Portland Packers Asso- ciation	300, 500, 600	— ¹	—	X	—	—
Washington Bay	..	..	56° 40' 00" N. 134° 15' 00" W.	KQS	200	Petersburg Pack- ing Co.	300, 550, 600, 1,650	— ¹	—	X	—	—
Wrangell	..	..	Alexander Archipelago 56° 28' 19" N. 132° 23' 12" W.	WVJ	100	U.S. Signal Corps	300, 600	P G	..	0800 to 2000	0.25	—
Yakutat	..	..	59° 34' 00" N. ² 130° 46' 00" W.	KKA	500	Libby, McNeill & Libby	300, 550, 600	P R	..	X	—	—

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
UNITED STATES OF AMERICA—contd.										
NAVASSA ISLAND										
Navassa Islands	Meridian of Greenwich. Windward Passage 18° 25' 00" N. 74° 00' 00" W.	NKC	125	U.S. Navy, U.S. Dept. of Commerce	300, 800	P G ..	N	0.30	—	
URUGUAY										
Banco Ingles (English Bank)	Meridian of Greenwich. To the South-East of Montevideo 35° 06' 30" S. 35° 53' 30" W.	CWC	100	Government	450, 600	—	—	—	—	¹ The station transmits a weather report each day except Sunday (see International Time and Weather Signals) ² Under construction
Cerrito	Near Montevideo 34° 51' 20" S. 56° 10' 10" W.	CWA	1,000	Government	800 , 1,000, 1,250 (c.w.)	P G ¹ ..	N	0.5-36	5.36	
Isla de Lobos ²	35° 01' 30" S. 54° 53' 01" W.	CWB	100	Government	450, 600	—	—	—	—	
VENEZUELA										
Barquisimeto	68° 18' 45" W. 10° 03' 57" N.	AYH	400	—	1,200, 1,650, 2,400, 3,200, 4,200	— ¹	Local time. 0800 to 1200 1400 to 1800	—	—	¹ This station corresponds with fixed stations only
Caracas	66° 55' 45" W. 10° 30' 24" N.	AYA	300	— ¹	800 , 825, 925, 1,125, 1,450, 1,650, 1,950	P G ..	0800 to 1200 1400 to 1800	0.60	6.00	
Caracas	10° 30' 24" N. 66° 55' 45" W.	HRE	300	—	600 , 900, 2,200 (c.w.)	P G ..	0800 to 1200 2000 to 2400	0.60	6.00	
Guayra (La) ..	67° 56' 45" W. 10° 36' 49" N.	AYG	400	—	800 , 1,200, 2,400, 3,100	P G ..	0800 to 1200 1400 to 1800	0.60	6.00	
Guayra (La) ..	10° 36' 49" N. 66° 56' 45" W.	HRH	600	Government	800 , 1,200, 2,200, 3,000 (arc.)	P G ..	N	0.60	6.00	

Maracay	67° 36' 45" W. 10° 15' 37" N.	AYB	300	—	600, 825, 925, 1,125, 1,450, 1,650, 1,950 (c.w.)	P G	—	0.60	6.00
Maracay	10° 15' 37" N. 67° 36' 45" W.	HRF	400	—	600, 900, 2,200 (c.w.)	P G	—	0.60	6.00
Maracaibo	71° 36' 30" W. 10° 38' 32" N.	AYF	300	—	600, 925, 1,300, 1,500, 1,650	P G	—	0.60	6.00
Maracaibo	10° 38' 32" N. 71° 36' 30" W.	HRI	400	—	600, 900, 1,200	P G	N	0.60	6.00
Porlamar	Isla de Margarita 63° 51' 13" W. 10° 56' 51" N.	AYE	200	—	600, 825, 925, 1,650	P G	—	0.60	6.00
Puerto Cabello	68° 00' 30" W. 10° 29' 42" N.	AYC	300	—	600, 825, 925, 1,650, 1,950 (c.w.)	P G	—	0.60	6.00
Puerto Cabello	10° 29' 42" N. 68° 00' 30" W.	HRK	300	—	600, 900, 2,200 (c.w. and i.c.w.)	P G	—	0.60	6.00
S. Cristobal	72° 14' 30" W. 07° 46' 11" N.	AYD	400	—	1,650, 2,400, 3,200, 3,600, 4,400	P G	—	—	—
S. Cristobal	07° 46' 11" N. 72° 14' 30" W.	HRG	600	—	600, 1,200, 2,200, 3,600 (arc.)	P G	—	0.60	6.00
VIRGIN ISLANDS OF THE UNITED STATES OF AMERICA									
S. Croix ²	West Indies 18° 12' 12" N. 64° 40' 05" W.	NNI	100	U.S. Navy	300, 600, 450	P G	N	0.30	—
S. Thomas ²	18° 20' 23" N. 64° 55' 52" W.	NBB	150	U.S. Navy	300, 600, 1,688	P G ¹	N	0.30	—
WINDWARD PAS- SAGE (See under BRITISH WEST INDIES)									

¹ The station broadcasts meteorological and hydrographic information (see International Time and Weather Signals). For distribution of weather forecasts, warnings and information, see Note 8, U.S.A.

² The accounts are settled by the owner.

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge, Francs.		Remarks.
								Per Word.	Minimum Charge.	
ZANZIBAR										
Penba	Meridian of Greenwich, 05° 14' 00" S.	VQE	85	Government	300, 600	P G	Local time of Zanzibar 0800 to 1200 1400 to 1600	0.20	1.60	
Zanzibar	39° 45' 00" E. 06° 10' 00" S. 39° 11' 00" E.	VPZ	300	—	300, 600	P G	0800 to 1200 1400 to 1600	0.20	1.60	

**SHIPBOARD
STATIONS**

SHIPBOARD STATIONS

The tables of shipboard stations set out in the following pages should be consulted in conjunction with the "Alphabetical List of Call Letters." The stations have been arranged alphabetically under the name of the ship on which they are situated.

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.	Country.
A.1	LAU	—	Navy	—	O	—	—	Norway
A.2	LAV	—	Navy	—	O	—	—	Norway
A.3	LAW	—	Navy	—	O	—	—	Norway
A.4	LAX	—	Navy	—	O	—	—	Norway
A.5	LAY	—	Navy	—	O	—	—	Norway
A. A. Augustus ¹⁰	KDXQ	150	Pioneer S.S. Company	300, 600	P G	X	0.10 ¹¹	Norway
A. A. Daugherty ¹⁰	KDHX	150	National Oil and Transport Co., Orange, Texas	300, 450, 600	P G	X	0.40	United States of America
Aagot ¹	TTL	200-250	(Armateurs) M. Kuhnle & Son, Bergen	300, 600	P G	X	0.40	United States of America
Aagtekerk ⁴³	OMQ	200	Vereenigde Nederlandsche Scheepvaartmaatschappij Holland-Australie Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	Norway
Aalborg ⁴⁰	OHH	200	Akterselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450, 600, 800	P G	X	0.40	Holland
Aalesund ¹	ATT	300	Det Norske Damptrafikerskap, Aalesund	300, 600	P G	X	0.40	Denmark
Aalsum ⁷⁷	HEG	150	Stoomvaart Maatschappij Oostzee, Amsterdam	300, 600	P G	X	0.40	Norway
Aaron Ward ⁸⁰	NELX	—	Navy	300, 600	P G	N	0.20 ¹¹	Holland
Aba ¹⁰	GDSW	—	—	300, 600, 2,100, 2,400, C.W.	P G	N	0.40	United States of America
Abadesa ¹⁰	ZAZ	180	United Fruit S.S. Corporation	300, 600	P G	X	0.40	Great Britain
Abangarez ⁹⁸	KDI	250	Navy	300, 600	P G	N	0.40	United States of America
Abarenda ⁹⁰	NOB	150	Navy	300, 600	P G	N	0.20 ¹¹	United States of America
Abaris ¹⁰	YJC	150	Navy	300, 600	P G	X	0.40	Great Britain
A. Bassini ¹⁰	IKS	—	Navy	—	—	X	—	Italy
Abbassich ¹⁰	ZTH	—	Lloyd Triestino Società di Navigazione a Vapore, Trieste	300, 600	P G	X	0.40	Great Britain
Abbazia ¹⁷	IYO	140	Vereenigde Nederlandsche Scheepvaartmaatschappij Holland Australie Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	Italy
Abbekerk ⁴³	PDAD	200	Compagnie de Navigation Paquet, Marseilles	300, 600	P G	X	0.40	Holland
Abbot ⁸⁰	NEZS	—	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	0.20 ¹¹	United States of America
Abda ¹	FPB	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	0.40	France
Abd-el-Kader ¹⁴⁴	FGK	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	0.10	France

Abdel Moneim ¹	250	SUG	Navy	.. .. .	300	P G	..	—	—	Egypt
Abdel ..	—	GEKF	Navy	.. .. .	300, 600	P G	..	—	—	Great Britain
Abel P. Upshur ²⁹	—	NUJD	Navy	.. .. .	300, 600	P G	..	0.20 ¹¹¹	0.40 ¹¹²	United States of America
Abercros ²⁷	—	KOVR	United States Shipping Board, Washington (D.C.)	.. .. .	300, 600	P G	..	0.40	—	United States of America
Aberdare ..	—	GKAF	Navy	.. .. .	—	P G	..	—	—	Great Britain
Aberdeen ² ..	100	VDG	Government (Department of Marine and Fisheries, Ottawa, Ont.)	.. .. .	300, 600, 800	O	..	—	—	Canada
Aberdorian ⁵⁰	100	ZKS	—	.. .. .	300, 600	P G	..	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Abesinta ³⁸	200	DAB	—	.. .. .	300, 600	P G	..	0.40	4.00	Germany
Abingdon ..	220	GKAJ	Navy	.. .. .	—	P G	..	—	—	Great Britain
Abinsi ¹⁹	220	MVP	—	.. .. .	330, 600, 2,100, 2,200 (c.w.)	P G	..	0.40	—	Great Britain
Abisko ¹ ..	150	SFL	Trafikaktiebolaget Grangesberg-Oxelösund, Stockholm	.. .. .	300, 450, 600	P	..	0.40	4.00	Sweden
Abisso ..	—	IBBD	Navy	.. .. .	—	—	..	—	—	Italy
Ablanet ¹⁰³	—	KIXF	United States Shipping Board, Washington (D.C.)	.. .. .	300, 600	P G	..	0.40	—	United States of America
Abner Coburn ²⁷	300	WHR	Libby, McNeill and Libby, 417 Market Street, San Francisco (Cal.)	.. .. .	300, 550, 600	P G	..	0.40	—	United States of America
Abodi-Mendi ¹	200	TOK	Sota y Aznar, Bilbao .. .. .	.. .. .	300, 600	P G	..	—	3.00	Spain
Abraham Lincoln ¹⁰³	300	KIXS	United States Shipping Board, Washington (D.C.)	.. .. .	300, 600	P G	..	0.40	—	United States of America
Abrown ^{9 131}	300	KEBD	United States Shipping Board, Washington (D.C.)	.. .. .	300, 450, 600	P G	..	0.40	—	United States of America
Absecon ¹⁰³	200	OHTA	Aktieselskabet Dampskibsselskabet Progress, Copenhagen	.. .. .	300, 450, 600, 800	P G	..	0.40	4.00	Denmark
Abesalon OUA ¹	—	OUA	Navy	.. .. .	600	O ³⁹	..	—	—	Denmark
Abasarka ¹⁰³	300	WKW	United States Shipping Board, Washington (D.C.)	.. .. .	300, 450, 600	P G	..	0.40	—	United States of America
Absecon ¹⁰³	200	KSEA	A. H. Bull S.S. Company, 17 Battery Place, New York (N.Y.)	.. .. .	300, 600	P G	..	0.40	—	United States of America
Abisia ¹⁹	150	OFA	Premuda G.L. Società Anonima di Navigazione a Vapore, Trieste	.. .. .	300, 600	P G	..	0.40	—	Great Britain
Abisrtea ¹⁷	140	UUM	—	.. .. .	300, 600	P G	..	0.40	—	Italy
Abukuma ¹	—	JLE	Government (Department of Marine and Fisheries)	.. .. .	300, 600, 800	O	..	—	—	Japan
Acadia ² ..	200	VDT	—	.. .. .	—	O	..	—	—	Canada
Acadjitia ¹⁹	150	ZHG	Standard Oil Company of N.J., Incorp., 26 Broadway, New York (N.Y.)	.. .. .	300, 600	P G	..	0.40	—	Great Britain
Acardo ¹⁹	—	GFPB	—	.. .. .	300, 450, 600	P G	..	0.40	—	Great Britain
Acarta ¹⁹	150	BOO	United States Shipping Board, Washington (D.C.)	.. .. .	300, 600	P G	..	0.40	—	Great Britain
A. C. Bedford ^{9 131}	300	KNZ	Mannie Swan Shipping Company, Ltd.	.. .. .	300, 450, 600	P G	..	0.20 ¹¹¹	0.40 ¹¹²	United States of America
Accomac ²⁷	—	KMOE	—	.. .. .	300, 600	P G	..	0.40	—	United States of America
Accra ..	—	GVLC	—	.. .. .	—	—	..	—	—	Mauritius

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres, (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Acrington ⁷¹	GDMJ	—	Great Central Railway	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Achattina ¹⁹	GFPD	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Achilles Dac ³⁵	DAC	200	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	X	0.40	4.00	Germany
Achilles GDBC ⁷¹	GDBC	—	Panama R.R. Company, 24 State Street, New York (N.Y.)	300, 600	P G	X	0.40	—	Great Britain
Achilles KPT ¹⁷	KPT	500	D. Aughelatos, Pireus	300, 450, 600	P G	N	0.40	—	United States of America
Achilles SWZS ¹	SWZS	150-200	Koninklijke Nederlandsche Stoom- boot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Greece
Achilles ¹ TWW	TWW	150	Compania Maritima, Bilbao, Eibar	300, 450, 600	P G	X	0.40	4.00	Holland
Achuri ¹	HXB	150	Standard Transportation Com- pany, 26 Broadway, New York (N.Y.)	300, 600	P G	N	0.30	—	Spain
Acme ⁹ 131	KIJ	150	Lloyd Brasileiro, Rio de Janeiro.. Stephen D. Stephendis	300, 450, 600	P G	X	0.40	—	United States of America
Acme ¹⁵	SRF	190	Northern Michigan Transportation Co., Chicago (Ill.)	300, 600	P G	N	0.40	—	Brazil
Acropolis ⁹ 131	KDRI	300	Rederiaktiebolaget Gefion, Hal- singsborg	300, 600	P G	N	0.40	—	United States of America
Actor ¹⁹	BOJ	135	—	300, 600	P G	N	0.40	—	Great Britain
Acushnet	NRU	75	—	300, 600	P G	N	0.20	—	United States of America
Ada Gøthron ¹	SJH	250	—	300, 600	P	0700 to 0730 1200 to 1230 2000 to 2030 (time of the meridian of Greenwich)	0.40	4.00	Sweden
Ada IOW ¹⁷	IOW	140	Compagnia Italiana Navigazione e Commercio d' Oltremare (C.I.N.C.O.), Rome	300, 600	P G	X	0.40	—	Italy
Ada O ¹⁷	IAA	140	Ente. Transporte Cotonii, Genoa	300, 600	P G	X	0.40	—	Italy
Ada PUY ¹⁵	PUY	120	Companhia Brasileira de Cabota- gem, Limitada, Rio de Janeiro (Armateur) K. Salvesen, Kragør	300, 600	P G	N	1.40	—	Brazil
Ada TTD ¹	TTD	125	—	300, 450, 600	P G	X	0.40	—	Norway
Adalia ³⁵	DBX	200	Navy	300, 600	P G	X	0.40	—	Germany
Adamant	GFUB	100-150	Lemos, M., Piraeus	300, 600	P G	X	0.40	4.00	Great Britain
Adamantios Lemos ¹	SWX	100-150	—	300, 600	P G	X	0.40	—	Greece
Adamastor	CTC	150	American S.S. Company	300, 600	O	N	—	—	Portugal
Adam E. Cornelius	KDVF	150	Lloyd Adriatico, Società di Naviga- zione, Venice	300, 600	P G	X	—	—	United States of America
Adamello ¹	UQN	140	—	300, 600	P G	X	0.40	—	Italy

Shipboard Stations

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Ship	IPG	No.	Navigation & Commercio Marittimo, Società Anonima, Genoa	300, 600	P G	N	0.40	Italy
Adda 17	140	135	Navy	300, 600	P G	X	0.40	Great Britain
Addington 18	140	135	Società Italiana di Navigazione & Commercio, Genoa	300, 600	P G	X	0.40	Australian Commonwealth
Adelaide	100-150	135	Association Maritime Belge, Antwerp	300, 600	P G	X	0.40	Italy
Adelina Hugo Stinnes 10	200	135	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	X	0.40	Belgium
Adeline Hugo Stinnes 35	400	135	Kokusai Kisen Kaisha	300, 600	P G	X	0.40	Germany
Aden 1	500	135	Navigation Generale Italiana, Genoa	300, 600	P G	X	0.40	France
Aden Maru 1	190	135	Hamburg-Amerika-Linie, Hamburg	300, 600	P G	X	0.40	Japan
Adige 17	120	135	Dampfschiffahrtsgesellschaft Argo Bremen	300, 600	P G	X	0.40	Italy
Adler DAA 35	100	135	Coronal Coal Company	300, 450, 600	P G	X	0.40	Germany
Adler DAR 1	200	135	Wm. H. Muller en Co.'s Algemeene Scheepvaart, Maatschappij, Amsterdam	300, 600	P G	X	0.40	United States of America
Adler KDTT	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	Germany
Admiral 35	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	Great Britain
Admiral Cochrane 19	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	Great Britain
Admiral Codrington 19	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	Holland
Admiral de Ruyter 1	100	135	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Admiral Dewey 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Evans 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Farragut 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Goodrich 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Hamilton 19	100	135	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	Great Britain
Admiral Hastings 10	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	Great Britain
Admiral Mayo 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Nicholson 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Rodman 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Schley 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Sebree 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Admiral Watson 9 131	100	135	Pacific S.S. Company, Portland (Maine)	300, 450, 600	P G	X	0.40	United States of America
Adna 19	100	135	Angfartygsaktiebolaget Adolf, Gothenburg	300, 600	P G	X	0.40	Great Britain
Adolf 1	100	135	Compagnie Nationale Belge de Transports Maritimes, Antwerp	300, 600	P G	X	0.40	Sweden
Adolf Deppe 10	100	135	Transports Maritimes, Antwerp	300, 600	P G	X	0.40	Belgium

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum Radiotelegram.	
Adole Sommerfeld ¹	DTA	200	Reederei Behnke und Sieg, Danzig (Armateur) K. Salvesen, Kragerø	300, 600, 800	P R ²⁴	X	0.40	4.00	Danzig
Adour ¹	TQL	300	—	300, 450, 600	P G	X	0.40	4.00	Norway
Adra ¹⁹	YHL	155	Compagnie des Chargeurs Reunis, Paris	300, 600	P G	X	0.40	—	Great Britain
Adrar ¹	FCZ	300	—	300, 600	P G	X	0.40	—	France
Adria IPU ¹⁷	IPU	140	Adria Società Anonima di Navigazione Marittima, Fiume	300, 600	P G	X	0.40	—	Italy
Adria KUSZ	KUSZ	200	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Adriatic ¹⁹	MHC	300	—	300, 600, 2,100, 2,200 (c.w.)	P G	N	0.40	—	Great Britain
Adriatico IEO ¹⁷	IEO	190	Esercizio Navigazione di Stato, Rome	300, 600	P G	X	0.40	—	Italy
Adriatico IXW ¹⁷	IXW	140	Marchese Visciola, Naples	300, 600	P G	X	0.40	—	Italy
Adriatico UVS ¹⁷	UVS	140	Lussino, Società Anonima di Navigazione a Vapore Lussim-piccino	300, 600	P G	X	0.40	—	Italy
Adriaticos ¹	SVA	100-150	Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G	N	0.40	4.00	Greece
Adrien ¹	UJF	150	Delpiere, Duval & Cie, Owners (Armateurs), Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Adrien de Montgolfier ¹	UMX	250	Compagnie des Forges et Aciéries de la Marine et d'Homécourt, 12 Place Rochefoucauld, Paris	300, 450, 600, 800	P G	X	0.40	—	France
Advance ²	KMV	300	Panama R.R. Company, 24 State Street, New York (N.Y.)	300, 450, 600	P G	N	0.20 ¹¹	—	United States of America
Adzuma	JRD	—	Navy	—	O	—	—	—	Japan
Agger	LEA	—	Navy	—	O	—	—	—	Norway
Agrit	OVK	—	Navy	600	O ²⁸	X	—	—	Denmark
A. E. McKinstry ²¹	CJE	200	Canada S.S. Lines	300, 600	P G	X	0.40	—	Canada
Aeneas ¹¹	MFU	250	Operated by A. Holt & Co., Managers, Liverpool	300, 600, 2,100, 2,200 (c.w.)	P G	X	0.40	—	Great Britain
Aeon SWA ¹	SWA	100-150	Panhellenic Steam Navigation Company	300, 600	P G	N	0.40	4.00	Greece
Aeon VKF ¹	VKF	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730	0.20 ⁸	0.40 ⁵	Australian Commonwealth

Shipboard Stations

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A. E. R. Schneider ²	WFUI	150	61 Fitzjohn's Avenue, Hampstead, London, N.W. 3	300, 450, 600	P G	..	X	0.40 ⁴¹	—	United States of America
Aetos	SYO	—	United States Shipping Board, Washington (D.C.)	—	O	..	6	—	—	Greece
Afel ⁹ 131	KISQ	—	United States Shipping Board	300, 600	P G	..	X	0.40	—	United States of America
Affinità ¹⁷ ..	IOH	140	Lloyd del Pacifico, Società di Navigazione, Savona	300, 600	P G	..	X	0.40	—	Italy
Afghanistan ¹⁹ ..	LUT	—	Hindustan Steam Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—	Great Britain
Afoudria ²⁷ ..	KOMQ	—	United States Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Africa CSA ⁸¹ ..	CSA	100-150	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	300, 600	P G	..	N	0.40	4.00	Portugal
Africa IAZ ¹² ..	IAZ	140	Martiniolich Marco U., Lussim-piccolo	300, 600	P G	..	X	0.40	—	Italy
Africana ¹⁷ ..	URX	140	Rederiaktiebolaget Transatlantic, Gothenburg (Gothenburg/South Africa Line)	300, 600	P	..	— ⁶²	0.40	4.00	Sweden
Africane ¹ ..	SFS	250	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	..	0800 to 1100	0.40	—	Japan
Africa Maru ¹ ..	JDF	400	British Africa Shipping and Coaling Company	300, 600	P G	..	1400 to 1700	0.40	—	Great Britain
African Prince ¹⁹ ..	ZVC	—	—	300, 450, 600	P G	..	2000 to 2400	0.40	—	South Africa (Union of)
Afric Shore ¹⁹ ..	VNL	Day 240, Night, 800	Aktieselskabet det Østasiatisk Kompagni, Copenhagen	300, 600	P G	..	X	0.40	—	Denmark
Afrika ⁴⁰ ..	OXO	350	Poret-Lopez & Cie., Boulogne-sur-Mer	300, 450, 600, 800	P G	..	X	0.40	—	France
Afrique II ¹ ..	FHA	—	Echevarrieta Larinaga, Bilbao	—	P G	..	X	0.04	—	Great Britain
Agadir GCQK ¹⁹ ..	GCQK	140	—	300, 450, 600	P G	..	X	0.40	—	Spain
Agadir TNC ² ..	TNC	150	Navy	300, 450, 600	P G	..	—	—	4.00	Great Britain
Agamemnon GERC ..	GERC	150	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	—	P G	..	X	0.40	—	Holland
Agamemnon TWY ¹ ..	TWY	140	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	..	X	0.40	—	Great Britain
Agamemnon ZJK ⁷¹ ..	ZJK	220	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	..	X	0.40	—	Great Britain
Agapenor ⁷¹ ..	ZJP	200	Managers, Liverpool	300, 450, 600	P G	..	X	0.40	—	Greece
Agapl ¹ ..	TGI	100-150	Hadjikyriakos Brothers, Athens	300, 600	P G	..	X	0.40	—	United States of America
Agarista ..	KLUU	—	United States Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Agawan ¹⁰⁰ ..	WNIE	300	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	Canada
Agawa ²¹ ..	VGDx	200	Algoma, Central and Hudson Bay Rly. Co., Sault Sainte Marie (Ont.)	300, 600, 800	P	..	— ³⁷	0.40	—	France
Agén ¹ ..	UMG	200	Société Maritime Auxiliaire de Transports, 3 Rue Scribe, Paris	300, 450, 600	P G	..	X	0.40	—	Denmark
Aggersund ⁴⁰ ..	OHC	200	Aktieselskabet Dampskibsselskabet Gylfe, Copenhagen	300, 450, 600, 800	P G	..	X	0.40	4.00	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Agile ..	FBGI	—	Navy ..	300, 800	P G	N	0.05	—	France
Agnello Ciampa ¹⁷ ..	IXY	140	Clampa F S & F. Piano di Sorrento ..	300, 600	P G	X	0.40	—	Italy
Agnes Dollar ²⁷ ..	WSF	100	Dollar S.S. Line, 230 California Street, San Francisco (Cal.)	300, 450, 600	P G	X	0.20	—	United States of America
Agnes Duncan ¹⁹ ..	ZVW	—	Navy ..	300, 600	P G	X	0.40	—	Great Britain
Agordat ..	IHI	—	United States Shipping Board, ..	300, 600	P G	X	—	—	Italy
Agron ..	KUVJ	—	Washington (D.C.) ..	300, 600	P G	X	0.40	—	United States of America
Aguila CBU ..	CBU	—	Navy ..	—	—	—	—	—	Chile
Aguila EJF ¹⁰ ..	EJF	180	—	300, 600	P G	—	0.40	—	Great Britain
Aguitre-Mendi ¹ ..	TNU	200	Sota y Aznar, Bilbao ..	300, 600	P G	0600 to 0800	—	—	Spain
Agustina Forner ¹ ..	HLH	200	Primo Redo, Valencia ..	300, 600	P G	0900 to 1200	0.30	3.00	Spain
Agwibay ..	KDSR	—	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	1400 to 1800	0.30	—	United States of America
Agwidale ¹⁰³ ..	WDOA	300	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	2000 to 2200	0.40	—	United States of America
Agwihavre ¹⁰³ ..	KDRX	200	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Agwimars ¹⁰³ ..	KDMC	200	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Agwimex ..	KDUQ	—	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	—	P G	X	—	—	United States of America
Agwilake ¹⁰³ ..	KDNN	200	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Agwimoon ¹⁰³ ..	KDBC	200	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Agwisca ¹⁰³ ..	KDMB	—	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Agwismith ¹⁰³ ..	KDRC	—	Atlantic Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America

Shipboard Stations

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SHIP	CLASS	NO.	NAME	COMPANY	TONNAGE	TYPE	STATUS	ORIGIN
Agwistone ¹⁰³	..	200	Pier 13, East River, New York (N.Y.)	Atlantic, Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 450, 600	PG	..	United States of America
Agwisun ¹⁰³	..	200	Atlantic, Gulf and West Indies S.S. Company	Atlantic, Gulf and West Indies S.S. Lines, 11 Broadway, New York (N.Y.)	300, 600	PG	..	United States of America
Agwiworld ¹⁰³	..	200	Eastern Steam Navigation Co., Ltd. Navy	Eastern Steam Navigation Co., Ltd. Navy	300, 450, 600	PG	..	United States of America
Ahmedi ¹⁵	..	90	Navy	Navy	600	O	..	India
Ahti	..	250	Navy	Navy	300, 600	PG	..	Estonia
Aida ¹	..	200	Navy	Navy	300, 800	PG	..	Egypt
Aidan ¹⁹	..	200	Navy	Navy	300, 800	PG	..	Great Britain
Aigle	..	—	Navy	Navy	300, 800	PG	..	France
Ailette	..	—	Navy	Navy	300, 800	PG	..	France
Aigli	..	—	Navy	Navy	300, 800	O	..	Greece
Almee ¹	..	200	Jean Huret et Cie., Boulogne-sur-Mer	Jean Huret et Cie., Boulogne-sur-Mer	300, 600	PG	..	France
Airedale ¹⁹	..	150	Navy	Navy	300, 600	PG	..	Great Britain
Airone	..	—	Navy	Navy	300, 600	PG	..	Italy
Airway ¹⁹	..	—	Navy	Navy	300, 800	PG	..	Great Britain
Aisne	..	—	Navy	Navy	300, 800	PG	..	France
Azkarai-Mendi ¹	..	200	Sota y Aznar, Bilbao	Sota y Aznar, Bilbao	300, 600	PG	..	Spain
Aiz Kori Mendi ¹	..	150	Navy	Navy	300, 600	PG	..	Spain
Ajax GEBD	..	200	Operated by A. Holt & Co., Managers, Liverpool	Operated by A. Holt & Co., Managers, Liverpool	300, 600	PG	..	Great Britain
Ajax ¹¹	..	200	Navy	Navy	300, 600	PG	..	Great Britain
Ajax NAKD ¹⁰⁴	..	—	British and African S.N. Company	British and African S.N. Company	300, 600	PG	..	United States of America
Akabo ¹⁹	..	170	Navy	Navy	300, 600	PG	..	Great Britain
Akagi ¹	..	—	Navy	Navy	—	O	..	Japan
Akashi ¹	..	—	Navy	Navy	—	O	..	Japan
Akawa ¹⁹	..	200	Navy	Navy	300, 450, 600, 2,100, 2,200	PG	..	Great Britain
Akbar ¹⁹	..	200	Bombay and Persia Steam Navigation Company, Ltd. (Agents, Turner, Morrison & Co., Ltd., Bombay)	Bombay and Persia Steam Navigation Company, Ltd. (Agents, Turner, Morrison & Co., Ltd., Bombay)	300, 600	PG	..	India
Akera ¹⁹	..	—	Navy	Navy	300, 600	PG	..	Great Britain
Aki ¹	..	500	Nippon Yusen Kaisha (Japan Mail Steamship Company)	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	O	..	Japan
Aki Maru ¹	..	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	PG	..	Japan
Akita Maru ¹	..	—	Navy	Navy	—	O	..	Japan
Akitushima ¹	..	200	United States Shipping Board, Washington (D.C.)	United States Shipping Board, Washington (D.C.)	300, 450, 600	PG	..	United States of America
Ala ⁹⁷	..	—	Osaka Sosen Kaisha (Osaka Mercantile Steamship Company)	Osaka Sosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	..	Japan
Alabama Maru ¹	..	400	Osaka Sosen Kaisha (Osaka Mercantile Steamship Company)	Osaka Sosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	..	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Alabama VJM ¹ ..	VJM	300	—	300, 600	PG ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time) X	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Alabama WFB ⁹ ..	WFB	150	Goodrich Transit Company, Foot of Michigan Ave., Chicago (Ill.)	300, 600	PG ..	X	0.20	—	United States of America
Alabama WRAE ¹⁰³ ..	WRAE	200	Texas Company, Port Arthur, Texas	300, 600	PG ..	X	0.40	—	United States of America
Aladdin ATS ¹ ..	ATS	200	(Armateurs) Farsjö & Co., Christiansia	300, 600	PG ..	X	0.40	4.00	Norway
Aladdin KDOM ⁹ ..	KDOM	—	Standard Transportation Company, 26 Broadway, New York (N.Y.)	300, 600	PG ..	X	0.40	—	United States of America
Aladdin OHIA ¹⁰ ..	OHIA	200	Aktieselskabet det Dansk-Norske Dampskibsselskab, Copenhagen	300, 450, 600, 800 300	PG ..	X	0.40	4.00	Denmark
Alagoas ..	SNA	60	Navy	300	O ¹⁶ ..	—	0.40	—	Brazil
Alameda NUGJ ⁹⁹ ..	NUGJ	—	Navy	300, 600	PG ..	N	0.20 ¹¹ 0.40 ¹²	—	United States of America
Alameda WAA ⁹⁷ ..	WAA	300	Alaska S.S. Company, 1107 Colman Building, Seattle (Wash.)	300, 450, 600, 1,800	PG ..	N	0.20	—	United States of America
Alamo ¹⁰³ ..	KEJ	200	Mallory S.S. Company, Pier 36, North River, New York (N.Y.)	300, 450, 600	PG ..	N	0.40	—	United States of America
Alamosa ⁹⁷ ..	WLUI	300	United States Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Alarich ⁹⁵ ..	DLJ	200	Washington (D.C.)	300, 450, 600	PG ..	X	0.40	4.00	Germany
Alaska HQE ¹ ..	HQE	250	Compagnie Generale Transatlantique, 6 Rue Aubert, Paris	300, 450, 600, 800	PG ..	X	0.40	—	France
Alaska LWO ¹ ..	LWO	200-250	(Armateur), Christian Haaland, Haugesund	300, 450, 600	PG ..	X	0.40	4.00	Norway
Alaska Maru ¹ ..	JAL	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG ..	0800 to 1100, 1400 to 1700 2000 to 2400 X	0.40	—	Japan
Alaskan ¹²⁴ ..	WKA	300	American Hawaiian S.S. Company, 8 Bridge Street, New York (N.Y.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Alatritium ¹⁷ ..	UQY	140	Esercizio Navigazione di Stato, Rome	300, 600	PG ..	X	0.40	—	Italy

Shipboard Stations

II

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Albertolite ²¹	..	150	Imperial Oil Ltd., Toronto (Ont.)	300, 600, 800	P	— ²⁷	0.40	—	Canada
Albertsville ¹⁰	..	250-500	Compagnie Belge Maritime du Congo, Antwerp	300, 450, 600, 800, 4,100	P G	X	0.40	4.00	Belgium
Albi ¹	..	200	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	X	0.40	—	France
Albiero ¹	..	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Albion ¹⁹	..	—	—	300, 600	P	X	—	—	Great Britain
Albionstar ¹⁰	..	200	Rederiaktieselskabet, Triton, Copenhagen	300, 600	P G	X	0.40	—	Great Britain
Albistan OHPA ¹	..	150	(Armateurs) A/S det Selmerske Rederi, Trondhjem	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Albr W. Selmer ¹	..	200	—	300, 600	P G	X	0.40	4.00	Norway
Albuera ¹⁹	..	150	Navy	300, 600	P G	X	0.40	—	Great Britain
Albury	..	—	Lloyd del Mediterraneo, Società di Navigazione, Rome	—	P G	X	—	—	Great Britain
Alcana ¹⁷	..	140	Anonima Genovese Armanenti e Trasporti Società di Navigazione, Genova	300, 600	P G	X	0.40	—	Italy
Alcazar ¹⁷	..	140	—	300, 600	P G	X	0.40	—	Italy
Alchiba ¹	..	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Alcione	..	—	Navy	—	—	—	—	—	Italy
Alcona ²⁷	..	300	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Alcor ¹	..	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Alcyon ¹	..	200	Bourgain, Bourgain, Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Alcyone ¹	..	200	Van Nievelt Goudriaan en Co.'s, Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Alda ²³	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Aldabi ¹	..	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland

Aldebaran Aldebaran	FAID HDB	—	Navy Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 800 300, 450, 600, 800	P.G. P.G.	N	0.05 0.40	France Holland
Aldebaran	HDB	250	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 800 300, 450, 600, 800	P.G. P.G.	X	0.40	Spain United States of America
Aldebaran	HDB	200	Francisco Aldecoa, Bilbao	300, 600 300, 600	P.G. P.G.	X	0.40 ¹¹¹ 0.40 ¹¹²	Holland
Aldebaran	HDB	250	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P.G. P.G.	X	0.40	Great Britain Australian Commonwealth
Aldebaran	HDB	300	—	300, 450, 600 300, 600	P.G. P.G.	X	0.40 0.20 ⁸ 0.40 ⁸	Spain Great Britain Italy
Aldebaran	HDB	200	Sofa y Aznar, Bilbao	300, 600 300, 600 300, 600	P.G. P.G. P.G.	X	0.40	Great Britain United States of America
Aldebaran	HDB	130	Adria Società Anonima di Navigazione Marittima, Trieste	—	P.G.	X	0.40	Brazil Canada
Aldebaran	HDB	140	United States Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	Germany Great Britain
Aldebaran	HDB	300	Lage & Irmãos, Rio de Janeiro	300, 600 300, 600	P.G. P.G.	X	0.40	United States of America
Aldebaran	HDB	100	Transports Maritimes de l'Etat	300, 600 300, 600	P.G. P.G.	X	0.10 ⁸⁷	Great Britain
Aldebaran	HDB	150	—	300, 600	P.G.	X	0.20 ¹¹¹ 0.40 ¹¹²	France Germany France
Aldebaran	HDB	200	—	300, 600	P.G.	X	0.40	Great Britain
Aldebaran	HDB	180	—	300, 600	P.G.	X	0.40	Great Britain
Aldebaran	HDB	—	Navy	300, 600	P.G.	X	0.40	Great Britain
Aldebaran	HDB	150	Cable Ship (General Post Office)	300, 600	Special correspondence relating to the service of the Ship	—	0.10 ⁸⁷	Great Britain
Aldebaran	HDB	—	—	300, 600	Special correspondence relating to the service of the Ship	—	0.10 ⁸⁷	Great Britain
Aldebaran	HDB	200	Navy	300, 800 300, 600 300, 450, 600	P.G. P.G. P.G.	X	0.05	France Germany France
Aldebaran	HDB	450	Compagnie de Navigation Sud-Atlantique, Paris	300, 450, 600	P.G. P.G.	X	0.40	Great Britain
Aldebaran	HDB	180	Compagnia Italiana Navigazione e Commercio d'Oltremare (C.I.N.C.O.), Rome	300, 600 300, 600	P.G. P.G.	X	0.40	Italy
Aldebaran	HDB	190	—	300, 600	P.G.	X	0.40	Italy
Aldebaran	HDB	—	Navy	—	P.G.	X	—	Great Britain Great Britain
Aldebaran	HDB	250	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P.G.	X	0.40	Denmark
Aldebaran	HDB	135	—	300, 600	P.G.	X	0.40	Great Britain
Aldebaran	HDB	100-150	Alexandros Kaloutas, Piræus	300, 600 300, 600	P.G. P.G.	X	0.40	Greece
Aldebaran	HDB	100-150	Solvay et Cie.	300, 600	P.G.	X	0.40	Belgium

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Kilo-gram.	
Alexandria ³⁵	DAE	200	—	300, 600	PG	X	0.40	4.00	Germany
Alexandrian ¹⁹	ZGM	150	Gournay-Delpeire et Cie., Boulogne-sur-Mer	300, 600	PG	N	0.40	—	Great Britain
Alexandrine ¹	UKO	150	(Armateurs) A/S Jacob R. Olsen, Bergen	300, 600	PG	X	0.40	—	France
Alf ¹	AUD	150-175	Tarabochia G., Trieste	300, 600	PG	X	0.40	4.00	Norway
Alfa ¹⁷	UTQ	140	Lage & Irmãos, Rio de Janeiro	300, 600	PG	X	0.40	—	Italy
Alfenas ¹⁸	SSS	150	Navy	300, 600	PG	N	0.40	—	Brazil
Alferez Mackinlay ¹	LMA	—	Adria. Società Anonima di Navigazione Marittima, Fiume	450, 600	O	X	—	—	Argentine Republic
Alfieri ¹⁷	UTT	140	Navy	300, 600	PG	X	0.40	—	Italy
Alicia	SYG	—	Compañía Transatlantica, Barcelona	—	O	X	—	—	Spain
Alfonso XII ¹	EDD	269	Compañía Transatlantica, Barcelona	300, 600	PG	N	0.30	3.00	Greece
Alfonso XIII EBB	EBB	550	Navy	—	O	N	—	—	Spain
Alfonso XIII EDT ¹	EDT	269	Compañía Transatlantica, Barcelona	300, 600	PG	N	0.30	3.00	Spain
Alfonso Fierro ¹	TLE	150	Compañía Naviera Fierros, S.A., Oviedo	300, 600	PG	N	0.30	3.00	Spain
Alfonso XIII TOB ¹	TOB	930	Compañía Transatlantica, Barcelona	300, 600	PG	N	0.30	3.00	Spain
Alfonso Perez ¹	TLH	150	Angel F. Perez, Santander	300, 600	PG	N	0.30	3.00	Spain
Alfred Calvert ¹⁹	BTU	130	Aktieselskabet Dampskipsreiselsskab Vendila, Copenhagen	300, 600	PG	X	0.40	—	Denmark
Alfred Hage ¹	OIA	350	(Armateur) Bernh. Hansen, Flekkefjord	300, 450, 600, 800	PG	X	0.40	4.00	Norway
Alfred Nobel ¹	TQD	150-200	Hijos de Jose, Taya, Barcelona	300, 600	P	X	0.40	4.00	Norway
Alfredo ¹	TLU	150	Navigazione Libera, Trieste	300, 600	PG	N	0.30	3.00	Spain
Alga ¹⁷	URU	140	V. Nirelt, Goudriaan Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	PG	X	0.40	4.00	Holland
Algenib ¹	PXK	200	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 450, 600	PG	X	0.40	4.00	Sweden
Algeria GBPT ³⁰	GBPT	250	—	300, 600	P	X	0.40	—	Great Britain
Algeria SLF ¹	SLF	150	—	300, 600	P	X	0.40	4.00	Sweden

(time of the meridian of Greenwich)

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radiotelegram.	
Alkyon ..	SYU	—	Navy	—	O	—	—	—	Greece
Allagunash ⁸⁷ ..	KVX	500	American Transatlantic Co., 17, Battery Place, New York (N.Y.)	300, 450, 525	P G	X	0.40	—	United States of America
All America ³ ..	KDWF	300	Mexican Telegraph Co., 56, Broadway, New York (N.Y.)	300, 450, 600	P G	N	—	—	United States of America
Allanbee ²⁸ ..	VGLP	75	B. C. Government	300, 450	O	X	—	—	Canada
Allanbany ¹⁹ ..	GFXZ	—	—	300, 450, 600	P G	X	0.40 ¹¹¹	—	Great Britain
Allagheny NACZ ⁹⁹ ..	NACZ	—	U.S. Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Allagheny WRAI ..	WRAI	—	Great Lakes Transit Corporation, Foot of Class St., Detroit (Mich.)	300, 600	P G	X	0.10	—	United States of America
Allegro ¹ ..	SDH	150	Konsul H. K. H. Pohlmann Storagen	300, 600	P	—	0.40	4.00	Sweden
Allen KDXC ..	KDXC	—	Dennis Sullivan	300, 600	P G	—	—	—	United States of America
Allen NJD ⁹⁹ ..	NJD	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Allentown ⁸⁷ ..	KVIU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Allianca ² ..	KMA	300	Panama R.R. Co., 24, State Street, New York (N.Y.)	300, 450, 600	P G	N	0.40	—	United States of America
Alliance ^{9 131} ..	WRV	100	Gulf Mail S.S. Co., 1, Drumm St., San Francisco (Cal.)	300, 600	P G	X	0.20	—	United States of America
Allies ^{9 131} ..	KQUA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Alloway ⁹⁷ ..	KTAA	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Alm ¹ ..	ATM	200	(Armateurs) Skibsaktieselskabet Loddings, Rederi, Christiania	300, 600	P G	X	0.40	4.00	Norway
Almagro ¹⁹ ..	GCKJ	—	—	300, 600	P G	N	0.40	—	Great Britain
Almanzora ¹⁹ ..	YZK	—	—	300, 600, 2,100, 2,200	P G	X	0.40	—	Great Britain
Almelo ¹ ..	PYG	200	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	C.W. 300, 600	P G	N	0.10	4.00	Holland
Almeria ¹⁹ ..	GBFD	—	—	300, 600	P G	X	0.40	—	Great Britain
Almirante Brown ¹ ..	LKI	—	Navy	450, 600	O	N	—	—	Argentina

Ship	Company	Port of Origin	Port of Destination	Passenger Capacity	Passenger Class	Passenger Fare	Passenger Service	Passenger Notes
Amirante Jacquay ¹⁵	SRX	190	North River, New York (N.Y.)	300, 600	P G	—	Brazil	
Amirante Lobo	EBN	140	Lloyds Brasileiro, Rio de Janeiro	300, 600	O	—	Spain	
Amirante Reis	CTA	100-150	Navy	300, 600	P G	—	Portugal	
Amirante Saldanha ¹	SSQ	150	Lloyds Brasileiro, Rio de Janeiro	300, 450, 600, 800	P G	—	Brazil	
Almkerk ¹	OMP	150	Verenigde Nederlandsche Scheepvaart Maatschappij, Holland-Australie Lijn, Rotterdam	300, 450, 600, 800	P G	4.00	Holland	
Alness ¹⁹	GDTJ	175	—	300, 600	P G	—	Great Britain	
Almoor ¹⁹	GJLZ	175	Yacht belonging to Arthur Curtis James, 99, John Street, New York (N.Y.)	300, 450, 600	P G	—	Great Britain	
Almoor ²	KYH	150	—	300, 450, 600	P G	—	United States of America	
Alondra ⁵⁹	GDFB	350	Wyandotte Transportation Co., Detroit (Mich.)	300, 450, 600	P G	—	Great Britain	
Alpena ^{9 131}	WCS	100	E. C. Schroeder ¹⁴	300, 600	P G	—	United States of America	
Alpha ²	KDWO	—	Van Nievelt, Goudriaan en Co.'s, Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	—	Holland	
Alphard ¹	PXL	200	—	300, 600	P	—	Canada	
Alphonse Racine ²	VGBL	140	W. B. Smith, Bermuda Bunkering Co., Hamilton Parish, Bermuda	300, 600	P G	—	Great Britain	
Alpine Range ¹⁹	YGH	140	Navy	300, 600	P G	—	Italy	
Alpino	IE	150	Boulet fils, Zunequin & Camu (Armateurs), Boulogne-sur-Mer	300, 600	P G	—	France	
Alprecht ¹	HOX	150	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	300, 600	P G	—	Japan	
Alps Maru	JBP	300	—	300, 600	P G	—	Great Britain	
Alresford	GEYM	—	Navy	300, 600	P G	—	France	
Alsace FWB ¹	FWB	300	Compagnie Française d'Armement et d'Importation de Nitrate de Soude, 11, Boulevard Malesherbes, Paris	300, 600	P G	—	France	
Alsace UHE ¹	UHE	160	Thomas, owner (Armateur), Boulogne-sur-Mer	300, 450, 600, 800	P G	—	Denmark	
Alsina ¹	FVS	400	Société Générale des Transports Maritimes à Vapeur, 70, Rue de la République, Marseilles	300, 450, 600, 800	P G	—	Norway	
Alsund ¹	OXX	350	Aktieselskabet Dampskibsselskabet (Armateur) Bernh. Hansen	300, 450, 600	P	—	Sweden	
Alstad ¹	LWU	400	Flekketford	300, 600	P G	—	Japan	
Alstern ¹	SJA	250	Rederiaktiebolaget Transatlantic, Gottenburg	300, 600	P G	—	Germany	
Altai Maru ¹	JFE	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 450, 600	P G	—	United States of America	
Altair DLY ³⁵	DLY	200	Navy	300, 600	P G	—	Germany	
Altair FBLT	FBLT	—	—	300, 600	P G	—	United States of America	
Altair NURJ ¹⁰²	NURJ	—	—	300, 600	P G	—	Germany	
Altmark ³⁵	DYN	200	—	300, 600	P G	—	Spain	
Altobizkar-Mendi ¹	TJI	150	Sota y Aznar, Bilbao	300, 600	P G	—	Spain	
Altona ³⁵	DNA	400	—	300, 600	P G	—	Germany	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs		Country.
							Per Word.	Minimum per Radio-telegram.	
Altuna-Mendi ¹	TOV	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Aludra ¹	OMH	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Alula	IGD	—	Navy	—	—	—	—	—	Italy
Altu-Mendi ¹	TML	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Alumine ¹	FWI	—	Compagnie Française de Marine et de Commerce, Paris	—	P G	X	0.40	—	France
Alvarado	GCKL	81	Navy	300, 600	P G	X	0.40	—	Great Britain
Alvaro de Bazan	EBM	200	—	300, 450, 600, 800	O	X	—	—	Spain
Alwine Russ ²⁵	DQY	200	—	300, 450, 600, 800	P G	X	0.40	4.00	Germany
Alwaki ¹	OMI	200	Van Nievelt, Goudriaan en Co.'s, Stoomvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Aagi ¹	JGS	—	Mitoui Bussan Kaisha	300, 600, 1,800	O	—	—	—	Japan
Amagisan Maru ¹	JYG	400	—	—	P G	—	0.40	—	Japan
Amakusa Maru ¹	JFAA	200	Osaka Shosen Kaisha (Osaka Mer- cantile Steamship Company)	300, 600	P G	—	0.40	—	Japan
Amalfi ¹⁷	IMD	190	Esercizio Navigazione di Stato, Rome	300, 600	P G	X	0.40	—	Italy
Amalienborg ¹	OHCA	350	Artiselskabet Dampskibsselskabet Danebrog, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Amalthus ¹⁹	GFCP	—	—	300, 450, 600, 800	P G	X	0.40	—	Great Britain
Amaratte CUC ⁴¹	CUC	100-150	—	300, 600	P G	N	0.40	4.00	Portugal
Anacarte FAYM	FAYM	—	Navy	600, 800	P G	N	0.05	—	France
Anarant ¹⁰⁸	NAPT	—	—	300, 600	P G	N	—	—	United States of America
Anarapora ⁷¹	GBKP	125	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Anarna ¹⁸	YRD	150	—	300, 600	P G	X	0.40	—	Great Britain
Anasir ¹⁹	YMT	160	—	300, 600	P G	X	0.40	—	Great Britain
Amassia ²⁵	DBW	200	—	300, 600	P G	X	0.40	4.00	Germany
Amatonga ¹⁹	ZPU	150	Mitsubishi Zosen Kaisha	300, 600	P G	X	0.40	—	Japan
Anatori Maru ¹	JBEA	200	(Armateur) Det. Geofysiske	300, 450, 600	P G	X	0.40	—	Japan
Amauer Hansen ¹	AQAC	200	—	—	P G	X	0.40	—	Norway

Ship	PNQ	SOA	150	Lloyd Brazilian, Rio de Janeiro	300, 300	0 16	Y	0.40	United States of America
Amazonas PNQ ¹³	150	Navy	300	O	..	0.40	Brazil
Amazonas SOA	60	Navy	300	O	..	0.40	Germany
Amazone AAM ¹	—	Navy	600, 800	P G	..	0.05	France
Amazone FBAB	300	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	..	0.40	France
Amazone FMZ ¹	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	..	0.40	Japan
Amazon Maru ¹	300	Eastern Telegraph Co., Ltd.	300, 600	P G	..	0.40	Great Britain
Ambassador ¹⁹	130	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze Paris	300, 450, 600	P	..	0.40	Great Britain
Amber ¹¹	130	—	300, 600	P G	..	0.40	France
Amber ¹⁹	350	—	300, 450, 600, 800	P G	..	0.40	France
Amboise ¹	350	—	300, 450, 600, 800	P G	..	0.40	France
Ambon ¹	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600	P G	..	0.40	Holland
Ambra ¹	200	(Armateurs) Finn Friis and C. O. Lund, Drammen	300, 600	P G	..	0.40	Norway
Ambridge ¹⁰³	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Ambroise Paré ¹	250	Fourmentin Avisse et Cie., Boulogne-sur-Mer	300, 600	P G	..	0.40	France
Ambrose	—	Navy	300, 600	P G	..	—	Great Britain
A. M. Byers ^{9 131}	200	North American Steamship Co., 1013, Rockefeller Building, Cleveland (Ohio)	300, 600	P G	..	0.10	United States of America
Amcross ^{9 131}	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	..	0.40	United States of America
Ameland ¹	100	Stoomvaart Maatschappij Triton, Rotterdam	300, 450, 600, 800	P G	..	0.40	Holland
Amelia ¹⁰³	200	Atlantic Fruit Co., 61, Broadway, New York	300, 400, 600	P G	..	0.40 ¹¹¹	United States of America
America ATE ¹	175-200	Wilh. Wilhelmsen, Christiania	300, 600	P G	..	0.40	Norway
America CDW ¹	250	Artigas Riofrio & Cia, Av. Errazuriz, 1172, Valparaiso	300, 600	P G	..	0.40	Chile
America IZA ¹⁷	270	Navigazione Generale, Italiana, Genoa	300, 600	P G	..	0.40	Italy
American KDOW	—	U.S. Mail Steamship Company	300, 450, 600, 1,800	P G	..	0.40	United States of America
American Maru ¹	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	..	0.40	Japan
American PDT ¹	100	American Petroleum Company, Rotterdam	300, 600	P G	..	0.40	Holland
American WKF ¹³⁴	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
American Legion ⁹⁷	200	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	..	0.40	United States of America
Americano ¹	300	Compañía Exportadora e Importadora de la Patagonia, Buenos Aires	300, 450, 600	P G	..	0.40	Argentine Republic

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
American Press ⁹ 131	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
American Star ⁹ 131	..	—	American Star Line, 26, Beaver Street, New York (N.Y.)	300, 450, 600	P G ..	X	0.20	—	United States of America
American Transport ¹⁹	..	140	Navy	300, 600	P G ..	X	0.40	—	Great Britain
Amirigo Vesputci	..	140	Società Italiana di Servizi, Martini, Rome	300, 600	P G ..	X	—	—	Italy
Amirigo Vesputci UTR ¹⁷	..	140	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Anversfoort ¹	..	150	Navy	300, 800	O ..	—	—	—	Greece
Anfritte	—	Navy	300, 800	P G ..	N	0.05	—	France
Amiens	140	Co-operativa Garibaldi	300, 600	P G ..	X	0.40	—	Italy
Amilcare Cipriani ¹⁷	..	—	Anonima fra Lavatori del Mare, Genova	—	—	—	—	—	Italy
Amiraglio Magnaghi	..	—	Navy	—	—	—	—	—	France
Amiral Duperré ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Fourchon ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Ganteaume ¹	..	180	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Jauréguiberry ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Latouche-Tréville ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Marquer ¹	..	180	Compagnie des Chargeurs Réunis, Paris	300, 450, 600	P G ..	X	0.40	—	France
Amiral Nielly ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Ponty ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Rigault de Genouilly ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Sallandrouze de Lamornaix ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Sones	..	—	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Amiral Tikhatchoff ¹	..	400	Transports Maritimes de l'Etat	600, 800	P G ..	N	0.05	—	France
Amiral Troude ¹	..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
							0.40	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radio-telegram.	
Antre	..	—	Navy	300, 800	P G	N	0.05	—	France
Ancula ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Andalusia ¹	..	150	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Andalusia DAX ³⁵	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Andalusia WJA ⁹⁷	..	—	U.S. Shipping Board, Washington, (D.C.)	300, 600	P G	N	0.40	—	United States of America
Andalusian ¹⁹	..	130	—	300, 600	P G	X	0.40	—	Great Britain
Andalusier ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Andania ⁷¹	..	125	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G	N	0.40	—	Great Britain
Andelle ³⁰	..	100	Navy	300, 450, 600	P G	X	0.15 ⁸⁷	1.50 ⁸⁷	Great Britain
Anden, April ¹	..	—	—	600	O ³⁹	X	—	—	Denmark
Auders ¹	..	150-175	(Armateur) N. Røgenes, Hauge-sund	300, 600	P G	X	0.40	4.00	Norway
Andes MRQ ¹⁹	..	200	Royal Mail S.P. Co.	300, 600, 2,100, 2,200 C.W.	P G	N	0.40	—	Great Britain
Andes LKR (Los) ¹	..	—	Navy	450, 600	O	N	—	—	Argentine Republic
Andes Maru ¹	..	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Andijk ¹	..	200	Nederlandsche Amerikansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Andorinha ¹⁹	..	130	Sota y Aznar, Bilbao	300, 600	P G	X	0.40	—	Great Britain
Andraka Mendi ¹	..	150	Navy	300, 600	P G	N	0.30	3.00	Spain
Andrea Doria	..	—	—	—	—	N	—	—	Italy
Andrea F. Luckenbach ⁹⁷	..	300	Luckenbach Steamship Company	300, 450, 600	P G	X	0.40	—	United States of America
Andreas ¹	..	100-150	Embricos Bros., Athens	300, 600	P G	X	0.40	4.00	Greece
Audre Chenier ¹	..	250	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.40	—	France
André ¹⁹	..	350	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	—	0.40	—	France
André Lebon ¹	..	300	—	300, 600	P G	X ²⁷	0.40	—	France
Andre et Louis ¹	..	200	Tetard Delpierre (Armateur), Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
André Pierre ¹	..	200	Acher, Duhamel & Gournay, Fecamp	300, 600	P G	X	0.40	—	France

Andrew Jackson ⁸²	KONO	U.S. Shipping Board, Washington (D.C.)	—	P.G.	—	—	—	—	United States of America
Andromaque	FADR	Navy	300, 800	P.G.	—	—	—	—	France
Andromède	UCO	Transports Maritimes de l'Etat	300, 600	P.G.	—	—	—	—	France
Andros ¹	SVC	Compagnie Nationale Hellenique de Navigation	300, 600	P.G.	—	—	—	—	Greece
Anemone ⁸⁶	NABP	Navy	300, 600	P.G.	—	—	—	—	United States of America
Angamos ⁸⁸	CAN	Navy	—	—	—	—	—	—	Chile
Angela ¹	TME	Antonio Pardo Santander	300, 600	P.G.	—	—	—	—	Spain
Angles KUBJ (The) ^{9 131}	KUBJ	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	—	—	—	—	United States of America
Angles WOL (Los) ¹⁰¹	WOL	Union Oil Company of California, Oleum (Cal.)	300, 600, 1,800	P.G.	—	—	—	—	United States of America
Angelo Brunetti ¹⁷	IMY	Esercizio Navigazione di Stato, Rome	300, 600	P.G.	—	—	—	—	Italy
Angelo Scarselli ¹⁷	IUK	Esercizio Navigazione di Stato, Rome	300, 600	P.G.	—	—	—	—	Italy
Angelo Toso ¹⁷	INN	Societa Nazionale di Navigazione, Genova	300, 600	P.G.	—	—	—	—	Italy
Angentinier ¹⁰	ORJ	Lloyd Royal Belge, Antwerp	300, 600	P.G.	—	—	—	—	Belgium
Angers ¹	UDE	Compagnie des Messageries Maritimes, 1, Rue Vignon, Paris	300, 600	P.G.	—	—	—	—	France
Angiola Bondi ¹⁷	IAP	Lloyd del Mediterraneo Societa di Navigazione, Rome	300, 600	P.G.	—	—	—	—	Italy
Angkor ¹	FMT	Compagnie des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P.G.	—	—	—	—	France
Anglet ¹	FLK	Cie des Chargeurs Français Plisson et Cie, Paris	—	P.G.	—	—	—	—	France
Anglia GCMK	GCMK	London & North Western Railway Company	300, 600	P.G.	—	—	—	—	Great Britain
Anglia SIA ¹	SIA	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P.	—	—	—	—	Sweden
Anglier ¹⁹	YAG	—	300, 600	P.G.	—	—	—	—	Great Britain
Anglo-Chilean ¹⁹	ZRS	—	300, 600	P.G.	—	—	—	—	Great Britain
Anglo-Colombian ¹⁹	GBKZ	—	300, 600	P.G.	—	—	—	—	Great Britain
Anglo-Egyptian ¹⁹	YUM	—	300, 600	P.G.	—	—	—	—	Great Britain
Anglo-Mexican ¹⁹	YYC	—	300, 600	P.G.	—	—	—	—	Great Britain
Anglo-Saxon ¹⁹	GUB	—	300, 600	P.G.	—	—	—	—	Great Britain
Ango ¹	FCP	Cie des Chargeurs Réunis, Paris	300, 600	P.G.	—	—	—	—	France
Angoulême ¹	FRG	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P.G.	—	—	—	—	France
Angora ¹⁹	GCQR	—	300, 600	P.G.	—	—	—	—	Great Britain
Anmoso ⁸⁸	IID	Navy	—	—	—	—	—	—	Italy
Anita ¹	TLJ	Irati y Ugalde, S. Sebastian	300, 600	P.G.	—	—	—	—	Spain
Aulwa ¹⁰¹	KROE	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	—	—	—	—	United States of America
Anjer	OLO	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 450, 600, 800	P.G.	—	—	—	—	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Ann Arbor No. 3	WDN	150	Ann Arbor Railroad Company, Toledo (Ohio)	300, 600	P G	X	0.10	—	United States of America
Ann Arbor No. 4	WDO	150	Ann Arbor Railroad Company, Toledo (Ohio)	300, 600	P G	X	0.10	—	United States of America
Ann Arbor No. 5	WDP	125	Ann Arbor Railroad Company, Toledo (Ohio)	300, 600	P G	X	0.10	—	United States of America
Ann Arbor No. 6	WDQ	150	Ann Arbor Railroad Company, Toledo (Ohio)	300, 600	P G	X	0.10	—	United States of America
Anna E. Morse ¹⁰²	KUTD	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Anna Pua ¹⁵	PUA	150	Empresa de Navegação, Hoepke, Florianopolis, S. Catharina (Armateur)	300, 600	P G	N	0.40	—	Brazil
Anna TTA ¹	TTA	100-150	Tonsberg Consulich Società Tristina di Navigazione, Trieste (Armateur)	300, 600	P G	X	0.40	4.00	Norway
Anna UTS ¹⁷	UTS	140	Aktieselskabet det Ostasiatiske Kompagni, Copenhagen	300, 600	P G	X	0.40	—	Italy
Anna Kayser ³⁵	DKY	200	Navy	300, 450, 600, 800	P G	X	0.40	4.00	Germany
Anniam ⁴⁰	OZN	250	Navy	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Annamite	FBAM	—	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 800	P G	N	0.05	—	France
Annan Maru ¹	JDN	200	City of Baltimore	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Annapolis KDOM ²	KDOM	150	Navy	300, 600	P G	X	0.20	—	United States of America
Annapolis NBR ⁹⁹	NBR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Anna Sophie ¹	LFK	150-200	(Armateurs) N. Rogenes, Haugesund	300, 450, 600, 800	P G	X	0.40	4.00	Norway
Annavore ¹	ASI	300	(Armateurs) Lundegaard & Stray, Farsund	300, 600	P G	X	0.40	4.00	Norway
Anne ⁷¹	GCSX	—	Operated by F. C. Strick & Co., Ltd., 27, Leadenhall Street, London, E.C.	300, 600	P G	X	0.40	—	Great Britain
Annielise ³⁵	DLC	200	Atlantic Fruit Co., 61, Broadway, New York	300, 450, 600	P G	X	0.40	4.00	Germany
Annetta ¹⁰³	WRG	150	Rolph Navigation & Coal Co., 230, California Street, San Francisco	300, 450, 600	P G	X	0.40	—	United States of America
Annette Rolph	KETZ	—		300, 600	P G	X	0.40	—	United States of America

200	DAL	Compagnie Auxiliaire de Navigation, 5, Avenue du Coq, Paris	300, 450, 600	P G	..	X	0.40	—	France
300	HQC	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
—	KIDM	U.S. Steel Products Company, 30, Church St., New York (N.Y.)	300, 450, 600	P G	..	X	—	—	United States of America
—	KDSG	Hijos de J. M. Rezola, San Sebastian	300, 600	P G	..	X	0.40	—	Great Britain
140	BQM	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.30	3.00	Spain
100	HNS	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IXV	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IXP	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	TUR	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	ILY	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	ILT	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IAC	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	ICCE	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	UQC	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IPE	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IZH	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IVI	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IAH	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
140	IAI	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
190	UPP	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	X	0.40	—	Italy
180	EJR	Società Nazionale di Navigazione, Genoa	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
200	DQJ	—	300, 450, 600	P G	..	X	0.40	4.00	Germany
—	GDSK	—	300, 450, 600	P G	..	X	0.40	—	Great Britain
—	FBMA	Navy	300, 800	P G	..	N	0.05	—	France
—	NATB	—	300, 600	P G	..	N	—	—	United States of America
250	SHI	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Antenor ¹ ..	PZL ..	200	De Nederlandsche Stoomvaart-Maatschappij Ocean, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Anteo ..	IFH ..	—	Navy ..	—	—	—	—	—	Italy
Anthony ⁶⁹ ..	NEVS ..	—	Navy ..	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Anthracite Bridge ⁶ 181 ..	KUKG ..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Antietam ..	KONR ..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Antigone AWP ¹⁰ ..	AWP ..	150-175	(Armateurs), Jens Lund & Co., A/S Orsnaes (Tonberg)	300, 600	P G ..	X	0.40	4.00	Norway
Antigone EUA ¹⁸ ..	EUA ..	130	Navy ..	300, 600	P G ..	X	0.40	—	Great Britain
Antigone FANI ..	FANI ..	300, 800	Hellenic Company of Maritime Enterprises, Piræus	300, 800	P G ..	N	0.05	—	France
Antigoni ¹ ..	SVJ ..	100-150	New York and Cuba Mail Steamship Company, Pier 13, East River, New York (N.Y.)	300, 600	P G ..	N	0.40	4.00	Greece
Antilla ¹⁰³ ..	KWD ..	300	Compagnie Générale Transatlantique, Paris	300, 450, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Antilles ¹ ..	FQX ..	—	Operated by A. Holt & Co., Managers, Liverpool	—	P G ..	N	0.40	—	France
Antillian ¹⁹ ..	MJL ..	200	Compagnie Auxiliaire de Navigation (D.C.)	300, 600	P G ..	N	0.40	—	Great Britain
Antiochus ⁷¹ ..	GTC ..	140	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	Great Britain
Antin ⁶⁴ ¹ ..	FZO ..	300	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G ..	X	0.40	—	France
Antioe ¹⁸ ..	GDMR ..	200	Esercizio Navigazione di Stato, Roma	300, 450, 600	P G ..	X	0.40	—	United States of America
Antinous KDAX ¹⁶³ ..	KDAX ..	200	Fourny & Cie., Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Antinous UEG ¹ ..	UEG ..	200	Liano, Ponte y Muñoz Aviles ..	300, 600	P G ..	X	0.20	—	United States of America
Antiochia ³⁵ ..	DAZ ..	200	Operated by Siemens Bros. & Co., Ltd., Woodwich London S.E. 18	300, 600	P G ..	X	0.40	—	France
Antiope ¹⁹ ..	GBYX ..	200	Madragal & Co., Manila (Philippine Islands)	300, 600	P G ..	X	0.40	—	United States of America
Antium ¹⁷ ..	URA ..	140	—	300, 600	P G ..	X	0.40	—	Germany
Antoinette ¹ ..	FHO ..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Antolina Ponte ² ..	TNK ..	150	—	300, 600	P G ..	X	0.40	—	Italy
Antonia GJBY ⁷¹ ..	GJBY ..	125	—	300, 450, 600	P G ..	X	0.40	—	France
Antonia KOLD ² ..	KOLD ..	300	—	300, 600	P G ..	N	3.00	—	Spain
							0.40	—	Great Britain
							—	—	United States of America

Ship	Class	Length	Beam	Depth	Speed	Engine	Armament	Complement	Notes
Antonia Mumbri ¹	CXA	150	150	150	150	150	150	150	Doningo Mumbri, Barcelona
Antonina ¹⁵	PVL	150	150	150	150	150	150	150	Compañia Lloyd Nacional, Rio de Janeiro
Antonio IWL ¹⁷	IWL	140	140	140	140	140	140	140	Lloyd del Mediterraneo Societa di Navigazione, Rome
Antonio OFB ¹⁸	OFB	—	—	—	—	—	—	—	Compañia Cantabrica, S. Sebastian
Antonio TMR ¹	TMR	100	100	100	100	100	100	100	—
Antonio Delino ³⁵	DFO	400	400	400	400	400	400	400	Compañia Navegacion Vascon- Asturiana, Aviles
Antonio de Saturnegui ²	TNF	200	200	200	200	200	200	200	Compañia Transatlantica, Barcelona
Antonio Lopez ¹	EDL	269	269	269	269	269	269	269	N. Galanes, New York
Antonios ¹	SVK	50-80	50-80	50-80	50-80	50-80	50-80	50-80	Midland Railway Company
Autrims ⁷¹	GN	150	150	150	150	150	150	150	Great Eastern Railway Company
Antwerp ⁷¹	GDFV	100-150	100-150	100-150	100-150	100-150	100-150	100-150	Compagnie Royal Belge, Argentina, Antwerp
Anvers ¹⁰	OOV	250-500	250-500	250-500	250-500	250-500	250-500	250-500	Compagnie Belge Maritime du Congo, Antwerp
Anversville ¹⁰	ONVA	150	150	150	150	150	150	150	Howard N. Findlay
Anvil ¹⁰⁸	KDYP	400	400	400	400	400	400	400	Toyo Kisen Kaisha (Oriental Steamship Company)
Anyo Maru ¹	JAY	150	150	150	150	150	150	150	Coastwise Steamship & Barge Co., Ltd., Vancouver (B.C.)
Anyx ³²	VGBR	150	150	150	150	150	150	150	Navy
Anzaz	GABD	—	—	—	—	—	—	—	Clyde S.S. Co., Pier 36, North River, New York
Apache FBAP	FBAP	300	300	300	300	300	300	300	U.S. Coastguard Treasury Dept., Washington (D.C.)
Apache KVA ¹³¹	KVA	100	100	100	100	100	100	100	Aktieselskab Det Forende Dampskibs Selskab, Copenhagen
Apache NACB ²	NACB	250-500	250-500	250-500	250-500	250-500	250-500	250-500	Wilson Fisheries Co., 2701, L. C. Smith Building, Seattle (Wash.)
A. P. Bernstorff ⁴⁹	OYN	150	150	150	150	150	150	150	Navy
Apex ²	KGUI	—	—	—	—	—	—	—	Navy
Aphis	GFOK	—	—	—	—	—	—	—	South African Railways and Harbours
Aplo ¹⁰²	NUDP	—	—	—	—	—	—	—	Société des Affrèteurs Réunis, Paris
A. Poerio	IFA	—	—	—	—	—	—	—	Compañia Anonima Maritima Union, Bilbao
Apolda ¹	VNP	Day	Day	Day	Day	Day	Day	Day	—
Apoll ¹⁹	GXC	240	240	240	240	240	240	240	—
Apollon	FRL	800	800	800	800	800	800	800	—
Apolo ¹	CMA	150	150	150	150	150	150	150	—
Appalachee ¹⁸	GCOS	140	140	140	140	140	140	140	—
Appan ¹⁸	GDJ	250	250	250	250	250	250	250	—
Applebranch ¹⁹	GCND	—	—	—	—	—	—	—	—
Appleleaf ¹⁸	ZVI	200	200	200	200	200	200	200	—
Appamattox ¹⁸	GFXT	—	—	—	—	—	—	—	—
Apsley ¹⁸	EUQ	—	—	—	—	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiotelegram.	
Apus ¹⁰³	KDBZ	200	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.20	—	United States of America
Aquarius ¹⁰³	KUSN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	—	—	United States of America
Aquila	IJP	—	Navy	—	—	—	—	—	Italy
Aquileja ¹	IPV	190	Lloyd Triestino Società di Navigazione a vapore, Trieste	300, 600	PG ..	N	0.40	—	Italy
Aquila ²	KOCJ	150	H. F. Alexander, Perkins Building, Tacoma (Wash.)	300, 425, 600	P ..	X	—	—	United State of America
Aquilone	IIW	—	Navy	—	—	—	—	—	Italy
Aquitaine ¹	FVO	200	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	PG ..	X	0.40	—	France
Aquitania ^{19 77}	MSU	500	Operated by Cunard S.S. Co., Ltd., Cunard Building, Liverpool	300, 600, 2,100, 2,400 C.W.	PG ..	N	0.40	—	Great Britain
Arabe	EBRA	—	Navy	300, 800	PG ..	N	0.05	—	France
Arabestan ¹⁹	MHT	—	—	300, 600	PG ..	X	0.40	—	Great Britain
Arabia DAJ ³⁵	DAJ	200	—	300, 800	PG ..	X	0.40	4.00	Germany
Arabia ¹⁰	ORBA	150-200	Association Maritime Belge, Antwerp	300, 600	PG ..	X	0.40	4.00	Belgium
Arabia Maru ¹	JEG	400	Osaka Shosen Kaisha (Osaka Steamship Company)	300, 600	PG ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Arabiana ¹⁹	GFXZ	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Arabian Prince ¹⁹	XIY	150	—	300, 600	PG ..	X	0.40	—	Great Britain
Arabie ¹⁹	GCRM	—	—	300, 450, 600	PG ..	N	0.40	—	Great Britain
Arabien ⁴⁰	OID	250	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	2,100, 2,200 300, 450, 600, 800	PG ..	X	0.40	4.00	Denmark
Arabier ¹⁹	EOL	150	—	300, 600	PG ..	X	0.40	—	Great Britain
Arabistan ¹⁹	ZMA	—	—	300, 600	PG ..	X	0.40	—	Great Britain
Aracati ⁵	STY	60	Lage & Irrnãos, Rio de Janeiro	300, 600	PG ..	N	0.40	—	Brazil
Aracaty ²	PBB	200	Companhia Commercio e Navegação, Rio de Janeiro	300, 500, 600	PG ..	N	0.40	—	Brazil
Arafura ⁷¹	GBFV	—	Operated by the Amalgamated Wireless (Australia), Ltd.	300, 600	PG ..	X	0.40 ¹¹	—	Great Britain
Aragaz ¹⁹	ZZR	135	Compania Transmediterranea, Barcelona	300, 600	PG ..	X	0.40	—	Great Britain
Aragon ¹	EEM	150	Transports Maritimes de l'Etat	300, 600	PG ..	N	0.30	3.00	Spain
Aragonia ¹	UFI	250	—	300, 600	PG ..	X	0.40	—	France
Aracaya ¹⁹	MBC	160	—	300, 600	PG ..	N	0.40	—	Great Britain

Ship	Year	Builder	Company	Port of Origin	Registered Tonnage	Actual Tonnage	Speed (knots)	Armament	Notes
Arakaka ¹²	1900	GUA	..	..	140	140	..	..	..
Arakan ¹	1900	PDH	..	..	150	150	..	..	..
Arak ¹⁹	1900	ZVF	..	..	135	135	..	..	..
Araluen ¹	1900	VJV	..	..	240	240	..	..	..
Aramac ¹	1900	VJJ	..	..	240	240	..	..	..
Aramis ¹⁰²	1900	NARP	..	..	..	..	..	..	..
Aratu	1900	SBH	..	..	..	..	..	..	..
Arana ¹⁹	1900	GCKF	..	..	..	..	..	..	..
Arankola ¹⁹	1900	GCOT	..	..	180	180	..	..	..
Aranmore ²	1900	VDQ	..	..	175	175	..	..	..
Aransgrund	1900	OJJ	..	..	50	50	..	..	..
Arantzazu ¹	1900	HMJ	..	..	150	150	..	..	..
Arantzazu-Mendi ¹	1900	TNS	..	..	200	200	..	..	..
Arapahoe ¹⁵	1900	KVB	..	..	300	300	..	..	..
Arasquary ²	1900	PPC	..	..	200	200	..	..	..
Ara ¹⁹	1900	YZP	..	..	120	120	..	..	..
Arator ¹	1900	SDG	..	..	250	250	..	..	..
Arauco ¹	1900	CDU	..	..	250	250	..	..	..
Arawatta ³¹	1900	VKV	..	..	240	240	..	..	..
Arbeit ³⁵	1900	DAT	..	..	200	200	..	..	..
Arbonne ¹⁹	1900	GDRT	..	..	..	..	..	..	..
Arbutus ⁹⁹	1900	NAGM	..	..	..	..	..	..	..
Arcadia TGV ¹	1900	TGV	..	..	100-150	100-150	..	..	..
Arcadia WWD ¹⁰¹	1900	WWD	..	..	200	200	..	..	..
Arcata ⁹⁹	1900	NADD	..	..	..	..	..	..	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Archangel ⁷¹	ZCP	120	Great Eastern Railway Company	300, 450, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Archangelos ¹	SVR	150-200	G. Livanos, Chios ..	300, 600	P G	X	0.40	4.00	Greece
Archarme ¹	HWD	180	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Archer ^{9 131}	KXG	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Archimede	IGF	—	Navy	—	—	—	—	—	Italy
Archimedes ¹⁹	YOC	170	—	300, 600	P G	X	0.40	—	Great Britain
Architect ¹⁹	ZHH	180	—	300, 600	P G	X	0.40	—	Great Britain
Arcois ¹⁹	GBX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Arctic ¹⁰²	NAFR	—	Government, Dept. of Marine and Fisheries	300, 600	P G	N	—	—	United States of America
Arctic	VDSI	200	—	300, 600, 800	O	X	—	—	Canada
Arcturus KURD ⁸⁷	KURD	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Arcturus NASJ ¹⁰²	NASJ	—	—	300, 600	P G	N	—	—	United States of America
Arcturus OJN ¹	OJN	250	—	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.15	0.75	Finland
Arcturus UHU ¹	UHU	180	Compagnie de Navigation Paquet, Marseilles	300, 600	P G	X	0.40	—	France
Arantzaz-Mendi ¹	TIK	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Ardea IAAH	IAAH	—	Navy	300, 600	—	—	—	—	Italy
Ardea UPR ¹⁷	UPR	190	Roma, Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Ardèche ¹	FQA	160	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Arden ⁸⁷	KDPN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Ardena ¹⁹	GDPN	200	London & South-Western Railway Company	300, 450, 600	P G	N	0.10 ⁸²	1.00 ⁸²	Great Britain
Ardent	FBAR	—	Navy	300, 800	P G	N	0.05	—	France
Ardente	IIB	—	Navy	—	—	—	—	—	Italy
Ardenza ¹⁹	GDQY	120	—	300, 600	P G	X	0.40	—	Great Britain
Ardola ¹⁹	GCJ	180	Navy	300, 600	P G	X	0.40	—	Great Britain
Ardimento	IIU	—	Navy	—	—	—	—	—	Italy
Ardito IIA	IIA	—	Navy	—	—	—	—	—	Italy

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.	Country.
Ariadne OJM ¹	OJM	250	—	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.15	Finland
Ariadne Alexandra ¹⁹	LUA	—	—	300, 600	P G	X	—	Great Britain
Ariadne Irene ¹⁹	EUS	130	—	300, 600	P G	X	—	Great Britain
Ariano ¹⁹	YFG	—	—	300, 600	P G	X	—	Great Britain
Arimathea ¹⁷	UVG	140	—	300, 600	P G	X	—	Italy
Arichachu ²	TNG	200	Rossi G., Società di Navigazione, Rome	300, 600	P G	N	3.00	Spain
Ariada-Mendi ¹	TMV	200	Compañia Naviera Bermeo, Bilbao	300, 600	P G	N	3.00	Spain
Ario ^{9 131}	KULM	300	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	United States of America
Ariosto ¹⁹	ZJB	—	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	Great Britain
Aris ¹	TGQ	100-150	—	300, 600	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	Greece
Aristides Bistis ¹	SWI	150-200	G. Vergottis, Athens	300, 600	P G	X	4.00	Greece
Aristides ¹	THO	100-150	A. Bistis, Andros	300, 600	P G	X	4.00	Greece
Aristobulo del Valle ¹	LMY	—	C. Athanasoulas, Piræus	300, 600	O	N	—	Argentine Republic
Ariz-Mendi ¹	TLS	200	Navy	300, 450, 600	P G	N	3.00	Spain
Arizona Maru ¹	JDZ	400	Sota y Aznar, Bilbao	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Arizona	NBW	—	Osaka Mercantile Steamship Co.	300, 600	P G	N	—	United States of America
Arizona NBW ⁹⁹	NBW	—	Goodrich Transit Company	300, 600	P G	N	—	United States of America
Arizona WFG ^{9 131}	WFG	150	Goodrich Transit Company, Foot of Michigan Avenue, Chicago (Ill.)	300, 600	P G	X	—	United States of America
Arizohan ¹³⁴	WKB	300	Amer-Hawaiian Steamship Co., 8, Bridge Street, New York	300, 450, 600	P G	X	—	United States of America
Arizpa ^{9 131}	KULN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	—	United States of America
Arkansas ⁹⁰	NBV	—	Navy	300, 600	P G	N	—	United States of America
Arkansas OIF ¹⁰	OIF	250	Aktieselskabet det Fornede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G	X	—	Denmark
Arkansas UFN ¹	UFN	200	Compagnie Générale Transatlantique, 6, Rue Auber, Paris	300, 600	P G	X	4.00	France
Arkona ¹	AAR	—	Navy	—	O	N	—	Germany

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line, or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Arracan ⁷¹	GWO	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	1000 to 1200 1400 to 1600 2000 to 2400	0.40	—	Great Britain
Arraiz-Mendi ¹	EDW	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Arraiz	TIF	500	Compania Naviera Vascongada, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Arras CFO ²	CFO	100	Government (Dept. of Marine and Fisheries)	300, 600, 800	O	X	—	—	Canada
Arras FBXA	FBXA	—	Navy	300, 800	P G	N	0.05	—	France
Arratoon Apar ¹⁵	VUE	200	British India S. N. Company, Ltd.	300, 600	P G	X	0.40	4.00	India
Arriaga-Mendi ¹	TNV	200	Sota y Aznar, Bilbao	300, 600	P G	X	0.30	3.00	Spain
Arriñaga ¹	ECG	150	Compania Minera Villadrid, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Ars ¹	FIZ	300	Société les Affrèteurs Réunis, 15, Rue Scribe, Paris	300, 450, 600, 800	P G	X	0.40	—	France
Arsa ¹⁷	UPI	190	Navigazione Libera Triestina, Trieste	300, 600	P G	X	0.40	—	Italy
Artagan Mendi ¹	CXU	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Artea-Mendi ¹	TOP	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Artemis FART	FART	—	Navy	600, 800	P G	X	0.05	—	France
Artemis KDLJ ²	KDLJ	150	J. M. Scott, 29, Broadway, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Artemis WQS ¹⁰³	WQS	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Artemisia ¹⁹	GBDC	—	Petroleum Maatschappij la Corona, The Hague	300, 600	P G	X	0.40	—	Great Britain
Artemis PDZ ¹	PDZ	200	Sota y Aznar, Bilbao	300, 600	P G	X	0.40	4.00	Holland
Artibas-Mendi ¹	TOO	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.30	3.00	Spain
Artigas ⁶⁷	KURG	—	Navy	300, 450, 600	P G	X	0.40	—	United States of America
Artigliere	IIG	—	Artus Danziger Reederei- und Handels-Aktiengesellschaft, Danzig	300, 600	P G	X	—	—	Italy
Artus ¹	DTC	200	—	300, 600	P G	X	0.40	4.00	Danzig
Artushof ³³	DAU	200	Sota y Aznar, Bilbao	300, 600	P G	X	0.40	4.00	Germany
Artaxanda-Mendi ¹	TLX	200	—	300, 600	P G	N	0.30	3.00	Spain
Arundel ⁷¹	MDZ	135	London, Brighton & South Coast Railway	300, 600	P G	N	0.10 ⁸²	1.00 ⁸²	Great Britain
Arundel Castle ^{40 77}	GCZL	350	—	300, 450, 600	P G	N	0.40	—	Great Britain

Ship	Company	Port	Class	Speed	Capacity	Passengers	Mail	Radio	Time	Origin
Ary	A. C. Lensens Stoomvaartmaatschappij, Terneuzen	200	OMV	150	300, 450, 600, 800	300, 450, 600, 800	—	—	—	Holland
Aryan	Texas Company, Port Arthur (Texas)	300	KOLB	125	300, 450, 600	300, 450, 600	—	—	—	United States of America
Arza-Mendi	Sota y Anar, Bilbao	200	TLR	150	300, 600	300, 600	—	—	—	Spain
Arzila	U.S. Shipping Board, Washington (D.C.)	300	GCOW	150	300, 450, 600	300, 450, 600	—	—	—	Great Britain
Asabeth	Navy	300	KIXG	150	300, 600	300, 600	—	—	—	United States of America
Asahi	Navy	—	JGB	—	—	—	—	—	—	Japan
Asama	(Armateur) K. M. Pedersen, Christiansand S	100-150	JRA	150	300, 600	300, 600	—	—	—	Japan
Asator	(Armateur) K. M. Pedersen, Christiansand S	300	TQJ	150	300, 600	300, 600	—	—	—	Norway
Asborg	Operated by A. Holt & Co., Managers, Liverpool	200	AUY	150	300, 600, 2,200 c.w.	300, 600, 2,200 c.w.	—	—	—	Norway
Ascanius	Navy	200	MFV	150	300, 600	300, 600	—	—	—	Great Britain
Ascaro	U.S. Shipping Board, Washington (D.C.)	135	IJF	125	300, 600	300, 600	—	—	—	Italy
Ascot	U.S. Shipping Board, Washington (D.C.)	250	MKZ	125	300, 600	300, 600	—	—	—	Great Britain
Ascuney	U.S. Shipping Board, Washington (D.C.)	300	KYV	150	300, 450, 600	300, 450, 600	—	—	—	United States of America
Ashee	Sabine Towing Company	150	KICG	150	300, 600	300, 600	—	—	—	United States of America
Asher, J. Hudson	U.S. Shipping Board, Washington (D.C.)	300	KDWG	150	300, 600	300, 600	—	—	—	United States of America
Asheville	U.S. Shipping Board, Washington (D.C.)	300	JRA	150	300, 600	300, 600	—	—	—	United States of America
Asland County	U.S. Shipping Board, Washington (D.C.)	300	NELW	150	300, 450, 600	300, 450, 600	—	—	—	United States of America
Ashtad	U.S. Shipping Board, Washington (D.C.)	300	KOMR	150	300, 600	300, 600	—	—	—	United States of America
Ashtad	U.S. Shipping Board, Washington (D.C.)	300	VXF	150	300, 600	300, 600	—	—	—	Australian Commonwealth
Ashtabula	Pennsylvania and Ontario Navigation Company, Cleveland (Ohio)	150	GBCX	125	300, 600	300, 600	—	—	—	Great Britain
Ashtabula	Compagnie Francaise de Navigation a Vapeur Cyprien Fabre & Cie., Marseilles	125	WEZ	125	300, 600	300, 600	—	—	—	United States of America
Ashtabula	Lloyd Triestino Societa di Navigazione a vapore, Trieste	200	WZ	125	300, 600	300, 600	—	—	—	Great Britain
Ashtabula	Aktieselskabet Det Ostasiatiske Kompagnie, Copenhagen	200	GDPM	125	300, 600	300, 600	—	—	—	France
Ashtabula	Compagnie des Chargeurs Reunis, Paris	200	FJD	125	300, 600	300, 600	—	—	—	Italy
Asia	Poret, Lobez & Cie., Boulogne-sur-Mer	140	IMN	140	300, 600	300, 600	—	—	—	Denmark
Asia	Lloyd Royal Belge, Antwerp	250	OYR	250	300, 450, 600, 800	300, 450, 600, 800	—	—	—	Great Britain
Asian	U.S. Shipping Board, Washington (D.C.)	200	MKL	200	300, 600	300, 600	—	—	—	France
Asian	U.S. Shipping Board, Washington (D.C.)	250	FCR	250	300, 600	300, 600	—	—	—	France
Asian	U.S. Shipping Board, Washington (D.C.)	250	FHI	250	300, 600	300, 600	—	—	—	Belgium
Asian	U.S. Shipping Board, Washington (D.C.)	150-200	OSW	150-200	300, 600	300, 600	—	—	—	United States of America
Ashtabula	U.S. Shipping Board, Washington (D.C.)	200	KETM	200	300, 600	300, 600	—	—	—	Norway
Ashtabula	U.S. Shipping Board, Washington (D.C.)	200-250	AQF	200-250	300, 600	300, 600	—	—	—	Norway

	OJO	250	26, Broadway, New York (N.Y.)	300, 600	P G	..	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.15	0.75	Finland
Astrea ¹	250	Navy	300, 800	P G	..	N	0.05	—	France
Astrée FASR	..	80	Société Navale Caennaise, Caen	300, 600	P G	..	N	0.40	— ⁸⁸	France
Astrée FWS	..	150	Aktieselskabet det Danske Petroleum-Aktieselskab, Copenhagen	300, 600	P G	..	X	— ⁸⁸	—	Denmark
Astrid ¹	—	Navy	300, 800	P G	..	N	0.05	—	France
Astrolabe	160	—	300, 600	P G	..	X	0.40	—	Great Britain
Astromer ¹⁹	250	Rederikabselskabet S.S.A., Stockholm	300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Astur ²	—	—	—	—	..	—	—	—	Great Britain
Asturian ²¹	150	Operated by Olivier & Co., Ltd., 1, Billiter Avenue, London E.C.3	300, 600	P G	..	N	0.40	4.00	Argentine Republic
Asturiano ¹	260	Sociedad Anonima Importadora y Exportadora de la Patagonia, Buenos Aires	300, 600	P G	..	X	0.40	—	Norway
Asturias	300-480	(Armateurs) Feamley & Eger, Christiania	300, 600	P G	..	X	0.40	—	Great Britain
Astyax ²¹	150	Operated by A. Holt & Co., Managers	300, 600	P G	..	X	0.40	—	United States of America
Asuncion ^{9 131}	150	G.W. McNear (Inc.), 433, California St., San Francisco (Cal.)	300, 450, 600	P G	..	X	0.40	—	Great Britain
Asuncion de Larinaga ¹⁹	150	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Japan
Atago ¹	—	Mitsui Bussan Kaisha	300, 600, 1,800	O	..	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Atagosan Maru ¹	400	—	—	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	France
Ataka Maru ¹	Day 400	Tatsuuma Shokai	300, 600	P G	..	X	0.40	—	Brazil
Atalaia ¹	200	Transports Maritimes de l'Etat .. Navy	300, 600	P G	..	N	0.05	—	Spain
Atlante	—	Lage & Irmãos, Rio de Janeiro	300, 600	P G	..	N	0.40	—	United States of America
Atalaya SSL ¹⁵	100	Compañia Naviera, Bermeo, Bilbao	300, 600	P G	..	N	0.30	3.00	Canada
Atalaya TNJ ²	200	United Fruit S.S. Corporation .. Canadian Pacific Railway Steamship Co., Montreal (P.Q.)	300, 600	P G	..	N	0.40	—	Greece
Atenas ²⁸	300	N. D. Lyciardiopolis, Piræus	300, 600	P G	..	X	0.40	4.00	Great Britain
Athabasca ²¹	200	Co., Ltd., 45a, Dale St., Liverpool	300, 450, 600	P G	..	N	0.40	—	Great Britain
Athanasios ¹	100-150	Operated by the British Molasses	300, 450, 600	P G	..	X	0.40	—	Great Britain
Athelstan ²¹	300	Co., Ltd., 45a, Dale St., Liverpool	300, 450, 600, 2,100, 2,200,	P G	..	X	0.40	—	Great Britain
Athenia ¹⁹	—	—	2,400	P G	..	X	0.40	—	Great Britain
Athenic MWN ¹⁹	200	Oceanic Steam Navigation Co., Ltd.	300, 450, 600, 2,100, 2,200, 2,400	P G	..	X	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Athenic ZUL ¹⁹	ZUL	150	Anglo-Belgic Shipping Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain
Atherstone	GKAN	—	Navy	—	P G	—	—	—	Great Britain
Athina ¹	SVM	100-150	The Hellenic Company of Maritime Enterprises, Piræus	300, 600	P G	N	0.40	4.00	Greece
Athlete	FATL	170	Navy	300, 800	P G	N	0.05	—	France
Atholl ¹⁹	EVV	—	—	300, 600	P G	X	0.40	—	Great Britain
Atlant ⁴⁷	SHY	350	Angfartysaktiebolaget Tirfing, Gothenburg	300, 600	P	— ³⁸	0.40	4.00	Sweden
Atlanta ¹⁷	IEN	190	Cosulich, Società Triestina di Navigazione, Trieste	300, 600	P G	N	0.40	—	Italy
Atlanta City	KDSW	300	U.S. Steel Products Co., 36, Church Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Atlanta of Texas ²⁷	KDCN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Atlante EFA ²	EFA	150	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Atlante IKW	IKW	—	Navy	—	—	—	—	—	Italy
Atlanten ¹	SLG	150	Rederiet for ss. Atlanten, Helsingborg	300, 600	P	X	0.40	4.00	Sweden
Atlantenhavet	OHZA	250	Aktieselskabet Dampskibsselskabet Atlanterhavet, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Atlantic ¹	SFT	250	Rederiaktiebolaget Transatlantic, Gothenburg, Gothenburg-South Africa Line	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.40	4.00	Sweden
Atlantic NENN ²⁹	NENN	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹² — ⁹⁸	—	United States of America
Atlantic OIH ¹	OIH	250	Aktieselskabet det Oversøiske Compagnie, Copenhagen	300, 450, 600	P	X	—	— ³⁸	Denmark
Atlantic YLJ ¹⁹	YLJ	125	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	Great Britain
Atlantica ¹	UFI	300	—	300, 600	P G	X	0.40	—	France
Atlantic City ¹⁹	GDRN	—	Kawasaki Zosenjo	300, 600	P G	X	0.40	—	Great Britain
Atlantic Maru ¹	JIT	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Atlántico ¹	LRP	260	Sociedad Anonima Importadora y Exportadora de la Patagonia, Buenos Aires	300, 600	P G	N	0.40	4.00	Argentine Republic

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
August Leffer ¹ ..	SLZ	250	I Lilliequist & Son, Gothenburg	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Augusto Riboty ..	IFF	—	Navy	—	—	X	—	—	Italy
August Schultze ¹⁸ ..	DYM	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Auldmair ¹⁹ ..	XEL	130	—	300, 600	P G ..	X	0.20 ¹¹	—	Great Britain
Aulick ²⁰ ..	NERG	—	Navy	300, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Aungban ¹⁵ ..	VWCR	180	Burma Oil Co., Ltd. (Agents), Finlay, Fleming & Co., Rangoon	300, 600	P G ..	X	0.40	—	India
Aurania ¹⁷ ..	IVA	140	Lloyd del Mediterraneo Societa di Navigazione, Rome	300, 600	P G ..	X	0.40	—	Italy
Auricula ..	GEYN	—	Navy	—	P G ..	—	—	—	Great Britain
Aurigny ¹ ..	FSA	200	Compagnie des Chargeurs, Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Aurillac ¹ ..	UMO	200	Société Maritime Auxiliaire de Transports, 1, Quai, J. Bart, Nantes	300, 600	P G ..	X	0.40	—	France
Aurochs ..	FARH	—	Navy	300, 800	P G ..	N	0.95	—	France
Aurora ..	GCAD	—	Navy	—	—	O	—	—	Canada
Ausable ²¹ ..	WWP	200	American Transatlantic Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Ausonia GJBZ ²² ..	GJBZ	125	Operated by Siemens, Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G ..	N	0.40	—	Great Britain
Ausonia IGB ..	IGB	—	Navy	—	—	—	—	—	Italy
Aussa ¹⁷ ..	UUU	190	Navigazione Libera Triestina, Trieste	300, 600	P G ..	X	0.40	—	Italy
Australbrook ¹ ..	CGN	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1530 to 1730	2.20 ⁸	0.40 ⁵	Australian Commonwealth
Australerag ¹ ..	VZQ	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1530 to 1730	0.20 ⁸	0.40 ⁵	Australian Commonwealth

Shipboard Stations

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1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

1400 to 1430
1630 to 1730
2030 to 0030
(Ship's Time)

Austral: Glen ¹	CGD	240	—	300, 600	P G	..	0.20 ^s	0.40 ^s	Australian Commonwealth
Australia GABF ¹	GABF	—	..	—	—	..	—	—	Australian Commonwealth
Australia KDXO # 131	KDXO	150	..	300, 600	P G	..	0.10 ¹⁹	—	United States of America
Australia YSN ¹⁹	YSN	160	—	300, 600	P G	..	0.40	—	Great Britain
Australic ¹	SPH	250	Rederiaktiebolaget Transatlantic Gothenburg, Gothenburg-Aus- tralia Line	300, 600	P	..	0.40	4.00	Sweden
Australien ⁴⁰	OZR	250	Aktieselskabet det Ostasiatiske København, Copenhagen	300, 450, 600, 800	P G	..	0.40	4.00	Denmark
Australier ONU ¹⁰	ONU	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	..	0.40	4.00	Belgium
Australier XJU ¹⁹	XJU	250	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	..	0.40	—	Great Britain
Australind ²¹	GQW	240	—	300, 600	P G	..	2.20 ^s	0.40 ^s	Australian Commonwealth
Australmead ¹³	VZW	240	—	300, 600	P G	..	2.20 ^s	0.40 ^s	Australian Commonwealth
Australmount ¹	VZY	240	—	300, 600	P G	..	2.20 ^s	0.40 ^s	Australian Commonwealth
Australpeak ¹	VZS	240	—	300, 600	P G	..	2.20 ^s	0.40 ^s	Australian Commonwealth
Australplain ¹³	CGB	240	—	300, 600	P G	..	2.20 ^s	0.40 ^s	Australian Commonwealth

mean time)
X ..

N
X

0915 to 1300
1630 to 2400

0930 to 1030
1200 to 1300

1400 to 1430
1630 to 1730

2030 to 0030
(ship's time)

0930 to 1030
1200 to 1300

1400 to 1430
1630 to 1730

2030 to 0030
(ship's time)

0900 to 1030
1200 to 1300

1400 to 1430
1630 to 1730

2030 to 0030
(ship's time)

0930 to 1030
1200 to 1300

1400 to 1430
1630 to 1730

2030 to 0030
(ship's time)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Australpool ¹	VZP	240	—	300, 600	P G	0900 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	2.20 ⁸	0.40 ⁵	Australian Commonwealth
Australport ¹	VZT	240	—	300, 600	—	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	2.20 ⁸	0.40 ⁵	Australian Commonwealth
Australrange ¹	CGA	240	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	2.20 ⁸	0.40 ⁵	Australian Commonwealth
Austria GBMT ¹⁹	GBMT	—	—	300, 450, 600	P G	—	0.40	—	Great Britain
Austria UDD ¹	UDD	300	Transports Maritimes de l'Etat	300, 600	P G	—	0.40	—	France
Austrian ⁵⁰	EMH	100	Cie Royal Austrienne des Mines,	300, 450, 600	P G	X	0.40	—	Great Britain
Austrienne ¹⁰	OPU	100-150	Brussels	300, 600	P G	X	0.40	4.00	Belgium
Author ¹⁰	YJN	—	—	300, 600	P G	X	0.40	—	Great Britain
Autonne ¹	FHU	200	E. and J. Delpiere Fils, Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Auxias March ²	EEA	150	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Aval ³⁵	DAM	200	Hart-Wood Lumber Company, San Francisco (Cal.)	300, 450, 600	P G	X	0.40	4.00	Germany
Avalon KIZL ²	KIZL	200	Wilmington Transportation Co., 593, Pacific Electric Building, Los Angeles (Cal.)	300, 600	P G	X	0.40	—	United States of America
Avalon WFF ^{9 131}	WFF	150	Société la Pêche Française, Fécamp	300, 600	P G	X	0.20	—	United States of America
Avant-Garde ¹	UKU	300	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	X	0.40	—	France
Avaré ²	SSI	400	Association Maritime Belge, Anvers	300, 600	P G	X	0.40	4.00	Brazil
Ave Maria ¹⁰	GDEX	—	—	300, 600	P G	X	0.40	—	Great Britain
Avenir (L) ¹⁰	ONE	170	Lloyd Telemo, Società di Navigazione	300, 450, 600	P G	X	0.40	4.00	Belgium
Aventino ¹²	UQE	190	—	300, 600	P G	X	0.40	—	Italy

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Azumasan Maru ¹	JBS	Day 400	Mitsui Bussan Kaisha ..	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Babboosic ^{9 131}	KITC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Baberton ¹⁰	GCVT	100	Ocean Motorship Company	300, 450, 600	P G ..	X	0.40	—	Great Britain
Babinda ²	KODP	—	Navy	300, 600	P G ..	X	0.20	—	United States of America
Babbitt ¹⁰	NEPX	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Baccarat FBAC	FBAC	—	Navy	300, 800	P G ..	N	0.05	—	France
Baccarat KUSX	KUSX	150	Independent S.S. Company, Foot Orleans Street, Detroit (Mich.)	300, 600	P G ..	X	0.20 ¹¹⁹	—	United States of America
Bacchus FIN ¹	FIN	300	Société les Affrèteurs Réunis, 15, Rue Scribe, Paris	300, 600, 800	P G ..	X	0.40	—	France
Bacchus TXA ¹	TXA	150	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Bache ¹⁰²	NLK	—	Company Naviera Bachi, Bilbao	300, 600	P G ..	N	—	—	United States of America
Bachi ¹	TIG	200	—	300, 600	P G ..	N	0.30	—	Spain
Backworth ¹⁰	GCBZ	—	Company Naviera Bachi, Bilbao	300, 600	P G ..	X	0.40	—	Great Britain
Bacoli ^{9 131}	KJU	200	Gillespie S.S. Corporation	300, 450, 600	P G ..	X	0.20	—	United States of America
Badagry ¹⁰	YEC	—	Navy	300, 600	P G ..	X	0.40	—	Great Britain
Badger ¹⁰	NEPT	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Badminton	GEYP	—	Navy	—	P G ..	—	—	—	Great Britain
Baependy ¹⁵	SSX	60	Lage & Irmaos, Rio de Janeiro	300, 600	P G ..	N	0.40 ¹¹¹ 0.20 ¹¹²	—	Brazil
Bagaduce ¹⁰	NAZP	—	Navy	300, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Bagdad ¹	FMY	400	Compagnie des Messageries Maritimes, Paris	300, 600	P G ..	— ¹⁷	0.40	—	France
Bagé ¹⁵	SSU	150	Lage & Irmaos, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Bages	HPH	350	Transports Maritimes de l'Etat	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	France
Bagley ¹⁰	NVU	—	—	300, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Bagnoli ¹⁷	IXO	190	Lloyd del Mediterraneo Societa di Navigazione, Rome	300, 600	P G ..	X	0.40	—	Italy
Bagshot ¹⁰	GKAP	—	Navy	—	P G ..	—	—	—	Great Britain
Bahadur ¹⁰	XTK	155	Navy	300, 600	P G ..	N	0.40	—	Great Britain
Bahia Blanca ¹	ILJO	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	Argentina Republic
Bahia SNB	SNB	150	Navy	300, 600	P G ..	N	0.40	—	Argentina Republic

	VWBF				300, 600	P G	X	0.40	India
Bahrén ¹³	—	Arab Steamers, Ltd. (Agents, Turner, Morrison & Co., Ltd., Bombay)	300, 600	P ³⁵	0800 to 1100 1100 to 1700 2000 to 2400	—	Japan
Balk Maru ¹	..	JAKA	400	Mitsubishi Yosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Balk Maru JRPA ¹	..	JRPA	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Bailey ⁹⁹	..	NCT	—	Navy	300, 600	P G	N	—	United States of America
Bainbridge ¹⁰²	..	NUOL	—	Navy	300, 600	P G	X	0.20	Cuba
Barre	..	PWL	300	(Armateurs) A. O. Lindvig, Christiania	300, 600	P G	X	0.40	Norway
Baja California ¹	..	LHC	—	—	300, 600	P G	X	0.40	Great Britain
Bakana ¹⁰	..	YCO	325	—	300, 600	P G	X	0.40	Australian Commonwealth
Bakara ¹	..	VJS	—	—	300, 600	P G	X	—	United States of America
Bakersfield ¹⁰³	..	KIZC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	Sweden
Balboa SHX ¹	..	SHX	350	Rederiktiebolaget Nordstjernan (Johnson Line), Stockholm. Sweden and Norway - Brazil - Uruguay - Argentine and Coast of the Pacific Line	300, 600	P G	X	0.40	United States of America
Balch ⁹⁹	..	NII	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Baldbutte ¹⁰³	..	KISM	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Balder ¹	..	SGO	200	Rederikt-Svenska Lloyd, Gothenburg, Sweden-Great Britain Line	300, 600	P G	N	0.40	Sweden
Balderton ¹⁹	..	GDQC	—	—	300, 600	P G	X	0.40	Great Britain
Baldhill ⁹⁷	..	KOBV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Baldina ³	..	VHZ	300	—	300, 600	P G	X	0.20 ⁸ 0.40 ³	Australian Commonwealth
Baldrock ⁹¹	..	KEQJ	150	United States & Bermuda Towing Company	300, 600	P G	X	0.40	United States of America
Baldr ³⁵	..	DYR	200	—	300, 600	P G	X	0.40	Germany
Balear ²	..	EFR	100	Compania Islaña Maritima, Barcelona	300, 600	P G	N	0.30	Spain
Balernes (Les) ¹	..	FBL	200	Compagnie Pêcheries Maritimes de l'Atlantique, La Rochelle	300, 600	P G	X	0.40	France
Balena	..	IFW	—	Navy	300, 600	P G	X	—	Italy
Balte ⁷¹	..	GCOB	—	Government	300, 600	P G	X	0.40	Great Britain
Bati HGc	..	HGc	—	—	300, 600	O	N	—	Siam

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge Francs.		Country
							Per Word.	Minimum per Radiotelegram.	
Bati PIK ¹	..	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Ballarat ¹⁹	..	—	—	300, 450, 600	P G ..	N	0.40	—	Great Britain
Ballard ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ballcamp ⁹ 131	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Ballena ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Ballenas ⁸⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Ballew ⁸⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Ballycotton ¹⁹	..	—	—	300, 450, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Ballygally Head ¹⁹	..	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Balmes ¹	..	275	Pinillos Izquierdo y Cia., Cadiz	300, 600	P G ..	N	0.30	3.00	Spain
Balmoral ⁷¹	..	—	Operated by Southampton, Isle of Wight & South of England R.M.S.P. Co., Ltd., 2, High Street, Southampton	300, 600	P G ..	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Balmoral Castle ⁵⁰	..	350	Navy	300, 450, 600 300, 800	P G .. P G ..	N N	0.40 0.05	—	Great Britain France
Balnalund ⁵⁰	..	350	—	300, 450, 600	P G ..	N	0.40	—	Great Britain
Balsam ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Baltabor ⁷¹	..	—	United Baltic Corporation, Ltd.	300, 600	P G ..	X	0.15 ⁸² 0.15 ⁸³	1.50 ⁸³	Great Britain
Baltannic ⁷¹	..	200	United Baltic Corporation, Ltd.	300, 600	P G ..	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Baltic DTB ¹	..	200	Baltisch-Amerikanische Petroleum Import - Gesellschaft m.b.H., Zoppot	300, 600	P G ..	0800 to 0900 1900 to 2000	0.40	4.00	Danzig
Baltic MBC ¹⁹	..	180	—	300, 600, 2,100, 2,200 c.w.	P G ..	N	0.40	—	Great Britain
Baltic OJY	..	100	Finska Angfartygs Aktiebolaget, Helsingfors	300, 600	P G ..	0800 to 1000 1200 to 1400	0.15	0.75	Finland

Baltic SFU ¹	SFU	250	Rederiktsbolaget	Transatlantic	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Baltic ¹⁷	UVA	140	Navigazione Generale Gerolmich & Comp Societa in Azioni, Trieste		300, 600	P G	X	0.40	—	Italy
Baltimore ⁹⁹	NCH	—	Navy		300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Baltimore Maru ¹	JCQ	400	Kawasaki Zosenjo		300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Baltique ¹	LEY	100-150	(Armateurs) Fred Olsen & Co., Christiania		300, 600	P G	X	0.40	4.00	Norway
Balto ¹⁰	LHI	100-150	(Armateur) B. Stolt Nielsen, Haugesund		300, 600	P G	X	0.40	4.00	Norway
Baltriger ⁷¹	GDXC	150	United Baltic Corporation, Ltd., Royal Indian Marine Ship		300, 600	P G	N	0.15	1.50	Great Britain
Baluchistan ¹⁹	VWBY	130	—		300, 600	P G	X	0.40	—	India
Balzac ⁷¹	YXK	—	—		300, 600	P G	X	0.40	—	Great Britain
Bambara	GCSY	—	—		300, 800	P G	X	0.40	—	Great Britain
Bambra ¹	FBMR	—	Navy		300, 800	P G	N	0.05	—	France
	VXB	240	—		300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	0.40 ⁸	Australian Commonwealth
Bampton ¹⁹	LSQ	130	—		300, 600	P G	X	0.40	—	Great Britain
Bampton Castle ¹⁹	YBF	—	—		300, 600	P G	X	0.40	—	Great Britain
Bamora ¹⁹	MST	180	—		300, 600	P G	X	0.40	—	Great Britain
Banana ¹	THH	100	Garrigos é Hijos Grao, Valencia		300, 600	P G	N	0.30	3.00	Spain
Banbury Castle ¹⁹	EOR	—	—		300, 600	P G	X	0.40	—	Great Britain
Banca ¹⁹	MFS	170	—		300, 600	P G	X	0.40	—	Great Britain
Banchory ¹⁹	ZQS	125	—		300, 600	P G	X	0.40	—	Great Britain
Bancroft ⁹⁹	NAJQ	—	Navy		300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Banda ¹	PZM	200	Stoomvaart Maatschappij Neder- land, Amsterdam		300, 450, 600, 800	P G	X	0.40	4.00	Holland
Bandai Maru ¹	JAQA	400	Nitta Kisen Kaisha		300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Bandaras ¹	TII	500	Compania Naviera Vasongada, Bilbao		300, 600	P G	N	0.30	3.00	Spain
Bandong ¹	PFW	150	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam		300, 600, 800	P G	X	0.40	4.00	Holland
Bandon ¹⁹	GDVL	—	—		300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Bandra ¹⁹	MCH	185	—		300, 600	P G	X	0.40	—	Great Britain
Bandshire ⁷¹	GVM	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18		300, 600	P G	X	0.40	—	Great Britain
Bangala ¹⁹	GAC	180	—		300, 600	P G	X	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Banka ..	PHI ..	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Bankdale ¹⁰ ..	ENF ..	250	Société Française Radio-Électrique	300, 600	P G ..	X	0.40	—	Great Britain
Bankoku Maru ¹ ..	JAS ..	400	Taisha Kisen Kaisha ..	300, 600	P as ..	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Bankura ¹⁰ ..	GCH ..	160	—	300, 600	P G ..	X	0.40	—	Great Britain
Bannack ^{9 131} ..	KIZQ ..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Banri Maru ..	JBFA ..	400	Hamane Shoten ..	300, 600	P as ..	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Bantu ^{9 131} ..	KLM ..	300	U.S. Steel Products Company, 30, Church Street, New York (N.Y.)	300, 450, 600	P G ..	X	0.20	—	United States of America
Baoulé ¹ ..	FSO ..	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Bapaume ..	FBPM ..	—	Navy	300, 800	P G ..	N	0.05	—	France
Baquedano ..	CAK ..	—	Boudet Fils, Zunequin, Canu & Cie. (Armateurs), Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Bar (Le) ¹ ..	UJU ..	150	—	300, 600	P G ..	X	—	—	France
Baracca ^{9 131} ..	KEDN ..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Baradine ¹⁰ ..	GFBN ..	—	—	300, 450, 600	P G ..	N	0.40	—	Great Britain
Barala ¹⁰ ..	GCM ..	170	Koninklijke Nederlandsche Stoomboot-Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	—	Great Britain
Barat ¹ ..	PXG ..	200	De West Indische Scheepvaart, Maatschappij ..	300, 600	P G ..	X	0.40	4.00	Holland
Baralt PJN ¹ ..	PJN ..	50-80	—	300, 450, 600, 800	P G ..	X	0.40	4.00	Curacao (Colony of)
Barambah ¹ ..	VJR ..	325	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	Australian Commonwealth
Barbacena ¹⁵ ..	PLD ..	100	Lage & Irmaões, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Barbacena HPQ ¹ ..	HPO ..	250	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Barbadian ¹⁰ ..	GROM ..	185	Società Veneziana di Navigazione a Vapore, Venice	300, 600	P G ..	X	0.40	—	Great Britain
Barbarigo ¹⁷ ..	IUZ ..	140	—	300, 600	P G ..	X	0.40	—	Italy

Barcelo ²	EEB	180	Compania Barcelona	Trasmediterranea,	300, 600	P G	N	0.30	Spain
Barcelona DBC ³⁵	DBC	200	—	—	300, 600	P G	X	0.40	Germany
Barcelona ECB ¹	ECB	300	Phillos Izquiero y Cia., Cadiz	—	300, 600	P G	X	0.30	Spain
Bard ¹	SLO	250	Rederiaktiebolaget Patria, Helsingborg	—	300, 600	P	N 0700 to 0730 2000 to 2030	0.40	Sweden
Bardic ¹⁹	BEM	170	Maatschappij Stoomschip Barendrecht, Rotterdam	—	300, 600	P G	X	0.40	Great Britain
Barendrecht ¹	PXD	150	—	—	300, 600	P G	X	0.40	Holland
Barenfels ³²	DBN	200	Koninklijke Paketvaart Maatschappij, Amsterdam	—	300, 600	P G	X	0.40	Germany
Bareutsz ¹	PMI	200	U.S. Shipping Board, Washington (D.C.)	—	300, 600	P G	X	0.40	United States of America
Bar Harbor ¹⁰³	KEFD	200	Navy	—	300, 600	P G	X	0.40	United States of America
Barham	GEBF	—	Navy	—	—	P G	—	—	Great Britain
Bari	IHW	—	Navy	—	—	—	—	—	Italy
Barima ¹⁹	ZNB	125	—	—	300, 600	P G	X	0.40	Great Britain
Barjora ¹⁹	GCT	175	—	—	300, 600	P G	X	0.20 ¹¹¹	Great Britain
Barker ⁹⁹	NUJK	—	Navy	—	300, 600	P G	N	0.40 ¹¹²	United States of America
Barkhamstead ^{9 121}	WLOU	—	U.S. Shipping Board, Washington (D.C.)	—	300, 600	P G	X	0.40	United States of America
Barlby ¹⁹	BTI	130	U.S. Shipping Board, Washington (D.C.)	—	300, 600	P G	X	0.40	Great Britain
Barlow ⁹⁷	WLAE	—	—	—	300, 600	P G	X	0.40	United States of America
Barney ⁹⁹	EZX	—	Navy	—	300, 450, 600	P G	X	0.15 ⁸² 0.20 ¹¹ 0.40 ¹²	Great Britain
Barney ⁹⁹	NVV	—	—	—	300, 600	P G	X	—	United States of America
Baroda ¹⁹	GDL	180	—	—	300, 600	P G	X	—	Great Britain
Baron Alisa ¹⁹	XES	—	—	—	300, 600	P G	X	—	Great Britain
Baron Ardrossan ¹⁹	MWW	160	—	—	300, 600	P G	X	—	Great Britain
Baron Baeyens ¹⁰	ONY	100-150	Compagnie Royal Belge, Antwerp	—	300, 600	P G	X	—	Great Britain
Baron Berwick ¹⁹	MSS	130	—	—	300, 600	P G	X	—	Belgium
Baron Blantyre ¹⁹	XLN	—	—	—	300, 600	P G	X	—	Great Britain
Baron Cathcart ¹⁹	ZRI	125	—	—	300, 600	P G	X	—	Great Britain
Baron Cawdor ¹⁹	GBTZ	—	—	—	300, 600	P G	X	—	Great Britain
Baron de Rio Branco	CWG	55	Navy	—	450, 600	O	—	—	Uruguay
Baron Douglas ¹⁹	ODD	—	—	—	300, 600	P G	X	0.40	Great Britain
Baron Elcho ¹⁹	ZPP	150	—	—	300, 600	P G	X	0.40	Great Britain
Baron Garioch ¹⁹	GENC	—	—	—	300, 600	P G	X	0.40	Great Britain
Baron Inchcape ¹⁹	BAU	185	—	—	300, 600	P G	X	0.40	Great Britain
Baron Jedburgh ¹⁹	MGD	170	—	—	300, 600	P G	X	0.40	Great Britain
Baron Lovat ¹⁹	GBDM	—	—	—	300, 600	P G	X	0.40	Great Britain
Baron Minto ¹⁹	YEK	185	—	—	300, 600	P G	X	0.40	Great Britain
Baron Napier ¹⁹	MJS	165	—	—	300, 600	P G	X	0.40	Great Britain
Baron Ogilvy ¹⁹	GBYC	165	—	—	300, 600	P G	X	0.40	Great Britain
Baron Polwarth ¹⁹	GRB	185	—	—	300, 600	P G	X	0.40	Great Britain
Baron Renfrew ¹⁹	ZOQ	120	—	—	300, 600	P G	X	0.40	Great Britain
Baron Sempill ¹⁹	ZFP	—	—	—	300, 600	P G	X	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Baron Vernon Baronesa ¹⁹	— GFXN ZQA	— 120	— —	300, 450, 600 300, 600	P G P G	X 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40 0.40	—	Great Britain Great Britain
Barpeta ¹⁹ Barra Bool ³⁰	MPR GFEP	170 —	— P. & O. Steam Navigation Company	300, 600 300, 600	P G P G	X N	0.40 0.40	—	Great Britain Great Britain
Barracoo ¹⁹ Barrallton ¹⁰³	YEF KIDT	— —	— U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	X X	0.40 0.40	—	Great Britain United States of America
Barranca KIFR ¹⁷	KIFR	—	Bisso Towboat Company	300, 600	P G	X	0.40	—	United States of America
Barranca MLL ¹⁹ Barrenfork ¹⁰¹	MLL KLJD	135 200	— U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	X X	0.40 0.40	—	Great Britain United States of America
Barroso. Barry ¹⁰²	SOB NUOP	150 —	— Navy	600 300, 600	O 16 P G	— N	0.40 —	—	Brazil United States of America
Barrymore ¹⁹ Barrington ¹⁰³	GDBT KIJF	— —	Johnston Line, Ltd. U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	X X	0.40 0.40	—	Great Britain United States of America
Barstow ¹⁰³	KIJR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Bartholomew ¹⁰¹	KOMF	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Bartolo ¹ Barunga ³	CMT VKA	150 300	Compania Navieri Bachi, Bilbao	300, 600 300, 600	P G P G	N 0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.30 ⁸ 0.20 ⁸ 0.40 ⁵	3.00 —	Spain Australian Commonwealth
Barwick ¹⁰³ Barwon ³	KOBR VXM	— 300	U.S. Shipping Board, Washington (D.C.) —	300, 600 300, 600	P G P G	X X	0.40 0.30 ⁸ 0.40 ⁵	— —	United States of America Australian Commonwealth

Shipboard Stations

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Basco ²	WVEI	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	..	X	0.40	—	United States of America
Bacobel ^{9 131}	KOFS	150	France and Canada Oil Transport Company	—	P.G.	..	X	0.20	—	United States of America
Baconia ¹	HLB	100	Zabide y Zulataca, Bilbao	300, 600	P.G.	..	N	0.30	3.00	Spain
Bastford ^{9 131}	KOFR	150	France and Canada Oil Transport Company	300, 600	P.G.	..	X	0.20	—	United States of America
Basis ¹	AUF	150-175	(Armateur) Christian Haaland, Haugesund	300, 600	P.G.	..	X	0.40	4.00	Norway
Basque ¹	FMU	250	Compagnie des Messageries Maritimes, Paris	300, 600	P.G.	..	N	0.40	—	France
Bassa ¹⁰	YYJ	—	Maurice Bernard (Armateur),	300, 600	P.G.	..	X	0.40	—	Great Britain
Bassano, ULF	ULF	180	Boulogne-sur-Mer	300, 600	P.G.	..	X	0.40	—	France
Bassano YQA ¹⁰	YQA	155	—	300, 600	P.G.	..	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	Great Britain
Basse-Terre ¹	FQE	250	Compagnie Générale Transatlantique, Paris	300, 600	P.G.	..	N	0.40	—	France
Bastant ¹	LEZ	100-150	(Armateurs) Fred Olsen & Co., Christiania	300, 600	P.G.	..	X	0.40	4.00	Norway
Bata ¹⁹	GBST	—	Navy	300, 600	P.G.	..	X	0.40	—	Great Britain
Batailleuse	FBAT	—	—	300, 800	P.G.	..	N	0.05	—	France
Batanga ¹⁰	YEB	155	Transports Maritime de l'Etat	300, 600	P.G.	..	X	0.40	—	Great Britain
Batavia ¹	UDH	250	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P.G.	..	— ²⁷	0.40	—	France
Batavia Maru ¹	JIC	200	—	300, 600	P.G.	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Batavier II ¹	PDO	100	Firma Wm. H. Muller & Co., Rotterdam	300, 600	P.R. ⁸⁵	..	N	0.05 ⁸¹	0.50 ⁸¹	Holland
Batavier III ¹	PDH	100	Firma Wm. H. Muller & Co., Rotterdam	300, 600	P.R. ⁸⁵	..	N	0.05 ⁸¹	0.50 ⁸¹	Holland
Batavier IV ¹	PDI	100	Firma Wm. H. Muller & Co., Rotterdam	300, 450, 600	P.R. ⁸⁵	..	N	0.05 ⁸¹	0.50 ⁸¹	Holland
Batavier V ¹	PDJ	100	Firma Wm. H. Muller & Co., Rotterdam	300, 600	P.R. ⁸⁵	..	N	0.05 ⁸¹	0.50 ⁸¹	Holland
Batavier VI ¹	PDG	100	Firma Wm. H. Muller & Co., Rotterdam	300, 600	P.R. ⁸⁵	..	N	0.05 ⁸¹	0.50 ⁸¹	Holland
Bath ⁹⁹	NHY	—	Navy	300, 600	P.G.	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Bathalum ¹⁰⁰	KIQT	—	U.S. Shipping Board, Washington, (D.C.)	300, 600	P.G.	..	X	0.40	—	United States of America
Bathgate ²	KIOS	—	Southern Transportation Co.,	300, 600	P.G.	..	X	0.40	—	United States of America
Bathurst ¹⁰	GBPM	120	—	300, 600	P.G.	..	X	0.40	—	Great Britain
Batjan ¹	PGV	250	Schoonvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P.G.	..	X	0.40	4.00	Holland
Batoe ¹	PYQ	250	Schoonvaart Maatschappij, Nederland, Amsterdam	300, 450, 600, 800	P.G.	..	X	0.40	4.00	Holland
Baton Rouge KDVB ²	KDVX	—	Maritima Manufacturing Company	300, 600	P.G.	..	X	—	—	United States of America
Baton Rouge KSG ^{9 131}	KSG	300	Standard Oil Company of N.J.	300, 450, 600	P.G.	..	X	0.40	—	United States of America
Baton Rouge WYDI ¹²⁵	WYDI	350	—	450, 600, 900, 1,110	O	..	X	—	—	United States of America
Batford ¹⁹	ZXL	170	—	300, 600	P.G.	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Bancis ¹ ..	UDM	200	Compagnie Auxiliaire de Navigation, 5, Avenue de Coq, Paris	300, 600	PG ..	X	0.40	—	France
Bavarian ¹⁹ ..	ZTU	135	—	300, 600	PG ..	X	0.40	—	Great Britain
Bavington ^{9 131} ..	KOPC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Bayano ¹⁰³ ..	WDEU	200	New York & Cuba S.S. Co. ..	300, 600	PG ..	X	0.40	—	United States of America
Bayano ¹⁹ ..	GBVQ	200	—	300, 600, 2,100, 2,200 c.w.	PG ..	X	0.40	—	Great Britain
Bayard ¹ ..	LER	150-200	(Armateurs) Fred Olsen & Co., Christiania	300, 600	PG ..	X	0.40	4.00	Norway
Baychimo ¹⁹ ..	GDWK	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Bayern ⁴⁵ ..	DBB	200	—	300, 600	PG ..	X	0.40	4.00	Germany
Bayeskimo ¹ ..	GJLY	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Bay Head ^{9 131} ..	KINT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Bayonne ¹⁷ ..	ILB	190	La Columbia, Genoa ..	300, 600	PG ..	X	0.40	—	Italy
Bayonne KFAG ^{9 131} ..	KFAG	150	Vacuum Oil Company ..	300, 450, 600	PG ..	X	0.40	—	United States of America
Bayou Chico ¹⁰³ ..	KDGK	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Bayport ..	KUTC	—	National Oil & Transport Company, Orange (Texas) ..	300, 600	PG ..	X	0.40	—	United States of America
Bayspring NISZ ¹⁰³ ..	NISZ	—	U.S. Navy ..	300, 600	PG ..	N	—	—	United States of America
Bay State ⁸⁷ ..	KDVR	—	U.S. Shipping Board, Washington (D.C.)	—	PG ..	N	—	—	United States of America
Bayton ²¹ ..	VGNJ	150	Matthews Steamship Company, Toronto, Ont.	300, 600, 800	P ..	X ²⁷	0.40	—	Canada
Baytown ^{9 131} ..	KDEM	300	Humble Oil & Refining Company, Houston (Texas)	300, 600	PG ..	X	0.40	—	United States of America
Bayway ^{9 131} ..	KSR	300	Standard Oil Company of New Jersey Incorporated, 26, Broadway, New York (N.Y.)	300, 600	PG ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Bawean ¹ ..	PHJ	250	Schoonvaart Maatschappij Nederland, Amsterdam	300, 600	PG ..	X	0.40	4.00	Holland
Beale ⁹⁹ ..	NCL	—	—	300, 600	PG ..	N	—	—	United States of America
Bear ² ..	NRB	150	U.S. Coastguard, Treasury Dept., Washington (D.C.)	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Beauport ¹⁰³ ..	KUBK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Beaurood ¹⁹ ..	GFGD	135	—	300, 600	PG ..	X	0.15 ¹¹²	1.50 ¹¹²	Great Britain

Shipboard Stations

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	KLJ	200	A. H. Bull, S.S. Company, 17, Battery Place, New York (N.Y.)	300, 600	P.G.	..	X	0.40	United States of America
Beaufort GEYO...	GEYQ	—	Navy	—	P.G.	..	—	—	Great Britain
Beaufort NGP ²⁹	NGP	—	Navy	300, 600	P.G.	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Béantemps-Beaupre	FBWD	—	Navy	600, 800	P.G.	..	N	0.05	France
Beaver ²⁸ ..	NEQQ	—	Navy	300, 600	P.G.	..	N	0.40 ¹¹²	United States of America
Beckenham ¹⁹	EWU	—	—	300, 600	P.G.	..	X	0.40	Great Britain
Bedeum ³⁰	GCON	100	—	300, 450, 600	P.G.	..	X	0.40	Great Britain
Bedebrug ³⁰	GFDQ	100	—	300, 450, 600	P.G.	..	X	0.40	Great Britain
Bedelaf ³⁰ ..	GJGX	100	—	300, 450, 600	P.G.	..	X	0.40	Great Britain
Bec	GFOL	—	Navy	—	P.G.	..	—	—	Great Britain
Beech Park ¹⁸	GGBR	—	—	300, 600	P.G.	..	X	0.40	Great Britain
Bechwood ¹⁹	YAE	185	—	300, 600	P.G.	..	X	0.40	Great Britain
Beechsterdijk ¹	TXX	200	Stoomvaart Maatschappij Neder- land, Amsterdam	300, 450, 600, 800	P.G.	..	X	0.40	Holland
Bégna ¹ ..	TUJ	300	(Armateur) Hans Christiana	300, 600	P.G.	..	X	0.40	Norway
Begoña No. 1 ¹	CXO	150	Compañía Naviera Begoña, Bilbao	300, 600	P.G.	..	N	0.30	Spain
Begonia No. 6 ¹	CXN	100	Compañía Naviera Begoña, Bilbao	300, 600	P.G.	..	N	0.30	Spain
Begonia No. 2 ¹	HLQ	150	José Maria Urquijo, S. Sebastian	300, 600	P.G.	..	N	0.30	Spain
Begonia No. 3 ¹	HLQ	200	José Maria Urquijo, S. Sebastian	300, 600	P.G.	..	N	0.30	Spain
Begonia No. 4 ¹	CMV	150	José Maria Urquijo, S. Sebastian	300, 600	P.G.	..	N	0.30	Spain
Begonia No. 5	HNE	150	José Maria Urquijo, S. Sebastian	300, 600	P.G.	..	N	0.30	Spain
Begum ¹⁹ ..	GJNL	—	—	300, 450, 600	P.G.	..	X	0.40	Great Britain
Beira CSR ³¹	CSB	100-150	Navy	300, 600	P.G.	..	N	0.40	Portugal
Beira CTK	CTK	100-150	—	300, 600	O	..	—	—	United States of America
Belam	WPEA	—	—	300, 600	P.G.	..	X	0.20	Brazil
Belam ¹⁹ ..	PVA	150	Compañia Lloyd Nacional, Rio de Janeiro	300, 600	P.G.	..	N	0.40	United States of America
Belfast ^{9 31}	KRD	150	Eastern S.S. Lines, India Wharf, Boston (Mass.)	300, 450, 600	P.G.	..	X	0.40	United States of America
Belfort FABL	FABL	—	Navy	300, 800	P.G.	..	N	0.05	France
Belfort KIQB ³⁷	KIQB	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	..	X	0.40	United States of America
Belfri ¹ ..	ASJ	150-175	(Armateur) Christen Christiana	300, 600	P.G.	..	X	0.40	Norway
Belgaum ¹	TFN	150-200	Société Anonyme Belgaum, Reyk- javik	300, 450, 600, 800	P.G.	..	X	0.40	Iceland
Belgian ¹⁹ ..	GCNM	—	—	300, 600	P.G.	..	X	0.40	Great Britain
Belgie ¹⁹ ..	ZXC	200	Lloyd Royal Belge, Antwerp	300, 600	P.G.	..	N	0.40	Great Britain
Belgie ¹⁰	OOB	150-200	Kawasaki Zosenjo	300, 600	P.G.	..	N	0.40	Belgium
Belgium Maru ¹	JUJ	400	—	300, 600	P.G.	..	—	0.10	Japan
Belgot ¹ ..	LCL	100-125	(Armateur) Christen Christiana	300, 600	P.G.	..	X	0.40	Norway
Belgrano LJV ¹	LJV	—	Navy	450, 600	O	..	N	—	Argentine Republic
Belgrano UFP ¹	UFP	400	Transports Maritimes de l'Etat	300, 600	P.G.	..	X	0.40	France
Belgravian ⁷¹	OEK	150	Operated by K. Saunders, 13, Ganton Street, London, W.1.	300, 600	P.G.	..	X	0.40	Great Britain
Belize ¹⁹ ..	BEO	120	—	300, 600	P.G.	..	X	0.40 ⁸⁸	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Wcrd.	Minimum per Radio-telegram.	
Belknap ⁹⁹	NEZZ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Bel AWT ¹	AWT	25	(Armateur) Det Kongelige Trans- og Toll Departement, Christiania	600	P G	X	0.40	4.00	Norway
Bel NATG ⁹⁹	NATG	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Bellachasse ²	VDS	100	Government (Dept. of Marine and Fisheries, Ottawa, Ont.)	300, 600	O	X	—	—	Canada
Bellasco ¹⁰	GFWR	—	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Bellatrix FBET	FBET	—	Van Nievelt, Goudriaan en Co's	300, 800	P G	N	0.05	—	France
Bellatrix PXQ ¹	PXQ	150	Stoonvaart, Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Bellbro ¹⁹	GFVD	—	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	Great Britain
Belbuckle ^{9 131}	KITK	— 300	(D.C.)	300, 600	P G	X	0.40	—	United States of America
Belle Isle ¹	FSI	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	X	0.40	—	France
Bellamina ^{105 132}	KODS	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
Belleplaine ⁹⁷	KOKF	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
Bellerby ¹⁰	ESY	130	Operated by A. Holt & Co., Man- agers, Liverpool	300, 600	P G	X	0.40	—	United States of America
Bellerophon ⁷¹	GTD	120	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	Great Britain
Bellerose ^{9 131}	KOKD	300	U.S. Shipping Board, Washington	450, 600	P G	X	0.40	—	United States of America
Bellfield ¹⁹	YDZ	135	(D.C.)	300, 600	P G	X	0.40	—	Great Britain
Bellflower ¹⁰⁸	KOPQ	300	U.S. Shipping Board, Washington	300, 600	P G	N	0.40	—	United States of America
Bellglade ⁷¹	BKR	—	Operated by the Peterborough Shipping Co., Ltd., Fleet Chambers, Jameson St., Hull	300, 600	P G	X	0.40	—	Great Britain
Bellhaven ^{9 131}	KOFC	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America
Bellingham ¹⁰⁸	WCIA	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
Belliquese	FBIQ	—	Navy	300, 800	P G	N	0.05	—	France
Bellona ¹	OWA	—	Navy	600	O ⁹⁹	X	—	—	Denmark
Bellone	FABO	—	Navy	300, 800	P G	N	0.05	—	France

Beltoon ¹⁹	..	ZCD	135	Compagnia Islena Maritima, Barcelona	300, 600	P G	..	X	0.40	—	Great Britain
Bellver ²	..	EFB	200	—	300, 600	P G	..	N	0.30	3.00	Spain
Belview ¹⁹	..	GFVJ	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Belmonte ²	..	SOL	—	Navy	—	O ¹⁶	..	—	0.40	4.00	Brazil
Belos ¹	..	SFI	250	Salvage Ship belonging to the Begningsach Dykeri-Aktiebolaget Nepton, Stockholm	300, 600	P	..	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.40	4.00	Sweden
Beldridge ¹	..	LEF	100-150	(Armateur) Wilh. Wilhelmson, Christiania	300, 600	P G	..	X	0.40	4.00	Norway
Beltana ¹⁹	..	MKR	175	—	300, 600	P G	..	X	0.40	—	Great Britain
Belvedere ¹⁷	..	ITX	190	Cosulich Societa Tristina de Navigazione, Trieste	300, 450, 600	P G	..	N	0.40	—	Italy
Belvidere ¹⁰³	..	KEQK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Bembridge ¹⁹	..	YKX	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Beme ²	..	VWCT	300	Burma Oil Co., Ltd. (Agents, Finlay, Fleming & Co., Rangoon)	300, 450, 600, 800	P G	..	X	0.40	—	India
Bempton ¹⁰	..	GDMB	—	Operated by the Hull Steam Fishing & Ice Co., Ltd.	300, 600	P G	..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Benalder ¹⁹	..	ENS	200	—	300, 600	P G	..	X	0.40	—	Great Britain
Benalla ¹⁹	..	GBJ	220	—	300, 600	P G	..	X	0.40	—	Great Britain
Benares ¹	..	SKI	250	Aktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg, Sweden-East Asia Line	300, 600	P	..	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Benary ¹⁹	..	YLT	220	—	300, 600	P G	..	X	0.40	—	Great Britain
Benavon ¹⁹	..	EJD	200	—	300, 600	P G	..	X	0.40	—	Great Britain
Benbow ¹⁹	..	GEBJ	—	Navy	—	P G	..	N	—	—	Great Britain
Bendigo ¹⁹	..	GFBQ	—	—	300, 450, 600, 2,100, 2,200, 2,400	P G	..	—	0.40	—	Great Britain
Bendoran ¹⁹	..	YEM	200	—	300, 600	P G	..	X	0.40	—	Great Britain
Bendu ¹⁹	..	ZME	185	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Benedict ¹⁹	..	ZKY	170	—	300, 600	P G	..	X	0.40	—	Great Britain
Benefactor ¹⁹	..	MOE	185	—	300, 600	P G	..	X	0.40	—	Great Britain
Benevento ²	..	STQ	400	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	..	N	0.40	4.00	Brazil
Bengal Maru ¹	..	JBQA	400	Nippon Yusen Kaisha, Japan Mail Steamship Company	300, 600	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Bengazi IAW ¹⁷	..	IAW	140	Societa Italiana di Servizi, Maritimi, Rome	300, 600	P G	..	X	0.40	—	Italy
Bengasi IGI	..	IGI	—	Navy	—	—	..	—	—	—	Italy
Bengkalis ¹	..	PHZ	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	..	X	0.40	4.00	Holland
Bengloe ¹⁹	..	YVA	—	—	300, 600	P G	..	X	0.45	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Bengo	PSC	100-150	Navy	300, 600	O	—	—	—	Portugal
Bengore Head ¹⁹	GJLT	—	—	300, 450, 600	PG	0600 to 0800	0.40	—	Great Britain
Benguela ¹⁹	ZMQ	—	—	300, 600	PG	0900 to 1200 1400 to 1800	0.40	—	Great Britain
Benin ¹⁹	ZMR	170	—	300, 600	PG	2000 to 2200 0600 to 0800 1400 to 1800	0.40	—	Great Britain
Benjamin Brewster ^{9 131}	KPS	300	Standard Oil Co. of New Jersey, Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	PG	2000 to 2200	0.40	—	United States of America
Benjamin Constant	SOC	150	Navy	600	O ¹⁶	—	0.40	—	Brazil
Benj. F. Packard ⁹⁷	WLA	300	Nacirena S.S. Corp., c/o Radio Corp. of America, Woolworth Building, New York (N.Y.)	300, 450, 525, 600	PG	—	0.40	—	United States of America
Benkam ⁹⁹	NIJ	—	Navy	300, 600	PG	—	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Benlawers	YJS	200	—	300, 600	PG	—	0.40	—	Great Britain
Benledi ¹⁹	YLU	200	—	300, 600	PG	—	0.40	—	Great Britain
Benlomon ¹⁹	LTC	200	—	300, 600	PG	—	0.40	—	Great Britain
Ben Mohr ¹⁹	BDO	135	—	300, 600	PG	—	0.40	—	Great Britain
Beunekom ¹	HDT	150	Koninklijke Nederlandsche Stoomboot-Maatschappij, Amsterdam	300, 450, 600, 800	PG	—	0.40	4.00	Holland
Ben Nevis ¹⁹	GYX	150	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	—	0.40	—	Great Britain
Benoni ¹⁰³	KERR	—	Ocean Motorship Company	300, 600	PG	—	0.40	—	United States of America
Benowa ²	KOTZ	300	—	300, 600	PG	—	0.20	—	United States of America
Benreoch ¹⁹	GJLT	350	—	300, 450, 600	PG	—	0.40	—	Great Britain
Benrimes ¹⁹	EKC	200	—	300, 600	PG	—	0.40	—	Great Britain
Bensalem ^{9 131}	KOFT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	—	0.40	—	United States of America
Benue ¹⁹	ZMF	155	—	300, 600	PG	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Benvenue ¹⁹	EPQ	185	—	300, 600	PG	—	0.40	—	Great Britain
Benvorlich ¹⁹	GCFB	—	Operated by Petersen & Co., Ltd., 6, Lloyd's Avenue, London, E.C.3	300, 600	PG	—	0.40	—	Great Britain
Benwood ⁷¹	YCA	155	—	300, 600	PG	2000 to 2200	0.40	—	Great Britain

Line	Ship	Year	Port of Origin	Company	Registered in	Flag	Length	Breadth	Depth	Displacement	Engine	Speed	Armament	Notes
1	Berbec 71	1910	Berbec	Operated by the Admiralty	Great Britain	Q 93	—	—	—	—	—	—	—	Great Britain
2	Berbec 19	1910	Berbec	Aktieselskabet Dampskibsselskabet	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
3	Berlin OIX 40	1910	Berlin	Patria, Copenhagen	Denmark	P G	300, 450, 600, 800	—	—	—	—	—	—	Denmark
4	Baregar 10	1910	Baregar	—	Great Britain	P G	300, 450, 600	—	—	—	—	—	—	Great Britain
5	Beregar 50	1910	Beregar	—	Great Britain	P G	300, 450, 600, 2,100, 2,200, 2,400	—	—	—	—	—	—	Great Britain
6	Berenice 1	1910	Berenice	Compagnie Auxiliaire de Navigation	France	P G	300, 600	—	—	—	—	—	—	France
7	Bergensfjord 23	1910	Bergensfjord	(Armateurs) A. S. Den Norske	Norway	P G	300, 450, 600	—	—	—	—	—	—	Norway
8	Bergsdalen 1	1910	Bergsdalen	Amerikalinje, Christiania	Norway	P G	800, 2,100	—	—	—	—	—	—	Norway
9	Berit 1	1910	Berit	(Armateur) T. L. Ravn, Bergen	Norway	P G	300, 600	—	—	—	—	—	—	Norway
10	Berja 1	1910	Berja	(Armateurs) F. S. Thom & Co., Christiania	Spain	P G	300, 600	—	—	—	—	—	—	Spain
11	Berkenhead 108	1910	Berkenhead	Sociedad Anonima Naviera Española, Barcelona	United States of America	P G	300, 600	—	—	—	—	—	—	United States of America
12	Berkut 19	1910	Berkut	Vacuum Oil Company	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
13	Berlin ABE 1	1910	Berlin	—	Germany	O	—	—	—	—	—	—	—	Germany
14	Berneco 1	1910	Berneco	Company Naviera Berneo, San Sebastian	Spain	P G	300, 600	—	—	—	—	—	—	Spain
15	Bermuda 19	1910	Bermuda	Nicolas Mihanovich Company, Ltd., Buenos Aires	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
16	Berna 1	1910	Berna	Société Anonyme les Chalutiers de la Rochelle, La Rochelle	Argentine Republic	P G	300, 600	—	—	—	—	—	—	Argentine Republic
17	Bernache 1	1910	Bernache	—	France	P G	300, 600	—	—	—	—	—	—	France
18	Bernadon 99	1910	Bernadon	Navy	United States of America	P G	300, 600	—	—	—	—	—	—	United States of America
19	Bernice	1910	Bernice	R. H. Arnold	United States of America	P	300, 495, 600	—	—	—	—	—	—	United States of America
20	Bernicia 1	1910	Bernicia	Rederiaktiebolaget Svenska Lloyd, Gothenburg	Sweden	P	300, 600	—	—	—	—	—	—	Sweden
21	Berini 19	1910	Berini	—	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
22	Berrima 19	1910	Berrima	—	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
23	Berryton 21	1910	Berryton	Mathews Steamship Company, Ltd., Montreal, P.Q.	Canada	P	300, 600, 800	—	—	—	—	—	—	Canada
24	Bersag Liere	1910	Bersag	Navy	Italy	P	—	—	—	—	—	—	—	Italy
25	Berwickshire 19	1910	Berwickshire	—	Germany	P G	300, 600	—	—	—	—	—	—	Germany
26	Berwindale 10	1910	Berwindale	—	Great Britain	P G	300, 600	—	—	—	—	—	—	Great Britain
27	Beskytteren 1	1910	Beskytteren	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	Denmark	P G	300, 600	—	—	—	—	—	—	Denmark
28	Beskoet 1	1910	Beskoet	(Armateurs) Den Norske Afrika-og Australielinje (Wilh. Wilhelmson, Tonsberg)	Holland	P G	300, 600	—	—	—	—	—	—	Holland
29	Bessa 1	1910	Bessa	(Armateur) Jens Folkman, Skien	Norway	P G	300, 600	—	—	—	—	—	—	Norway
30	Bessegeten 1	1910	Bessegeten	U.S. Shipping Board, Washington (D.C.)	Norway	P G	300, 450, 600	—	—	—	—	—	—	Norway
31	Bessmer City 9 131	1910	Bessmer City	U.S. Steel Products Co., 30, Church Street, New York (N.Y.)	United States of America	P G	300, 450, 600	—	—	—	—	—	—	United States of America
32	Bessmer 1	1910	Bessmer	(Armateurs) A/S Ganger Rolf, Christiania	Norway	P G	300, 450, 600	—	—	—	—	—	—	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Bessie Dollar ²¹	VFO	200	Dollar Steamship Line, Ltd., 880, Hastings St., Vancouver, B.C.	300, 600	P G	N	0.40	—	Canada
Bertha ¹	TPK	125	(Armateurs) Skibsaktie-selskapet Loddings, Rederi 3, Christiania (D.C.)	300, 450, 600	P G	X	0.40	4.00	Norway
Bethelridge ¹⁰³	KERT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Bethlehem Bridge ⁸⁷	KIJV	—	U.S. shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Bethore ^{9 121}	KDWW	300	Ore Steamship Co., Incorp., 111, Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Béthune	FABE	—	Navy	300, 800	P G	N	0.05	—	France
Betis ¹	TIM	100	Compañia Española de Navegación, Valencia	300, 600	P G	N	0.30	3.00	Spain
Betsy Bell ⁸⁷	KITM	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Betterton ⁹⁷	KUBG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Betty R.	KDTF	—	Edward C Crossett	200, 300, 600	P R	X	—	—	United States of America
Betwa ¹⁹	BDZ	190	—	300, 600	P G	X	0.40	—	Great Britain
Beukelsdijk ¹	TVB	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Beursplein ¹	TZK	150	Scheepvaart Maatschappij Millingen, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Beverwijk ^{20 1}	HES	150	Sleepboot Maatschappij Beverwijk, Beverwijk	300, 600	P G	X	0.40	4.00	Holland
Bhamo ⁷¹	GWA	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	4.00	Great Britain
Bharata ¹⁹	GAD	200	—	300, 600	P G	1000 to 1200	0.40	—	Great Britain
Biafra ¹⁹	YCF	180	—	300, 600	P G	1200 to 1400	0.40	—	Great Britain
Biarritz AQAS ¹	AQAS	150-175	(Armateurs) A/S Ganger Rolfs, Christiania	300, 600	P G	X	0.40	4.00	Norway
Biarritz EZN ⁷¹	EZN	—	Operated by the South-Eastern & Chatham Railway Co.	300, 600	P G	0800 to 1000	0.10 ⁸²	1.00 ⁸²	Great Britain
Bibbo	KDHJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Biddle ⁹⁹	NYW	—	Navy	300, 600	P G	N	0.20 ¹¹¹	0.40 ¹¹²	United States of America

	ALCOA	U.S. Shipping Board, Washington (D.C.)	300, 430, 600, 1,800	P G	X	0.40	United States of America
Bida ¹⁹	YNC	—	300, 600	P G	X	0.40	Great Britain
Bien-Hoa ..	FABH	Navy	300, 800	P G	X	0.05	France
Bilbaino ..	HMC	Garrigos é Hijos, Grad Valencia	300, 600	P G	N	0.30	Spain
Bilboa ³⁵	DIO	Nederlandsche — Amerikansche	300, 450, 600	P G	N	0.40	Germany
Bilderdijk ¹	TZU	Stoomvaart Maatschappij Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	Holland
Billingsley ¹⁰²	NUPO	U.S. Navy	300, 600	P G	N	—	United States of America
Billiton ¹ ..	PGI	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	Holland
Billing ¹ ..	DLF	—	300, 450, 600	P G	X	0.40	Germany
Biloela ¹ ..	CGR	—	300, 600	O	X	—	Australian Commonwealth
Binfield ¹⁹	GBMV	—	300, 600	P G	X	0.40	Great Britain
Bingera ¹ ..	VJD	—	300, 600	P G	X	2.20 ^s	Australian Commonwealth
Bingo Maru ¹	JBG	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	N	0.40	Japan
Binnendijk ..	TXZ	Nederlandsche — Amerikaansche	300, 450, 600, 800	P G	X	0.40	Holland
Bintang OIAC ⁴⁰	OIAC	Stoomvaart-Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600,	P G	X	0.40	Denmark
Bintang PHV ¹	PHV	Aktieselskabet Det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	P G	X	0.40	Holland
Biran ^{9 131}	KKOA	Stoomvaart Maatschappij Nederland, Amsterdam	300, 600	P G	X	0.40	United States of America
Bird City ¹⁰³	KOBP	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Birk ¹ ..	LDD	(Armateurs) A/S Red. Odtejl, Bergen	300, 600	P G	X	0.40	Norway
Birna ¹ ..	PFR	Stoomvaart Maatschappij, Rotterdamse Lloyd, Rotterdam	300, 600, 800	P G	X	0.40	Holland
Birmingham City ^{9 131}	KUTT	U.S. Steel Products Co., 30 Church Street, New York (N.Y.)	300, 450, 600	P G	—	0.20	United States of America
Birmingham GEDQ	GEDQ	Navy	—	P G	—	—	Great Britain
Birmingham NCN ⁸⁹	NCN	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Birte ..	OILA	Antieselskabet Dampskibsselskabet Myren, Copenhagen	300, 450, 600, 800	P G	X	0.40	Denmark
Biskra ..	FGA	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.10	France
Biscargi Mendi ¹	HMN	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	Spain
Bisley ¹⁹	YCB	—	300, 600	P G	X	0.40 ^e	Great Britain
Bisson FBIS	FBIS	Navy	300, 800	P G	X	0.05	France
Bisson FBX ¹	FBX	Compagnie Lorientaise de Chalutages, Lorient	300, 600	P G	X	0.40	Great Britain
Bithina ¹⁹	YIX	—	300, 600	P G	X	0.10 ⁸⁷	Great Britain
Bittern GBXQ ¹⁹	GBXQ	—	300, 600	P G	X	1.00 ⁷⁸	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Bittern ⁹⁸	NIJR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹² 0.40	—	United States of America
Biyo Maru	JPD	400	Toyo Kisen Kaisha (Oriental Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Bjorongen ¹	LHK	250	(Armateur) Olav Haabeth, Stavanger	300, 450, 600	P G	X	0.40	4.00	Norway
Bjoreia ¹	TUK	200	(Armateur) Hans Christiania	300, 600	P G	X	0.40	4.00	Norway
Bjornefjord ¹	ARQ	300	(Armateur) Joh. Ludw Mowinkel, Bergen	300, 600	P G	X	0.40	4.00	Norway
Bjornstjerne Bjornson ¹	LHU	200-250	(Armateur) Olaf Orvig, Bergen	300, 450, 600	P G	X	0.40	4.00	Norway
Blaameyra ¹	TUH	300	(Armateur) Hans Christiania	300, 600	P G	X	0.40	4.00	Norway
Black Arrow ⁸⁷	WLN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Black Hawk ⁸⁹	NAJD	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Blackheath ¹⁹	EWV	120	—	300, 600	P G	X	0.40	—	Great Britain
Blackhill ¹⁰	BCC	—	—	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Black Prince ¹⁹	YJB	150	—	300, 600	P G	X	0.40	—	Great Britain
Black Sea ⁷¹	GDLW	—	—	300, 600	P G	X	0.40	—	Great Britain
Blackwater	GKAQ	—	Operated by the British Black Sea Shipping & Oil Co., Ltd., 65, London Wall, London, E.C.2	—	P G	—	—	—	Great Britain
Blair ¹⁰³	KIGR	300	Navy	300, 450, 600	P G	X	0.40	—	United States of America
Blairbeg ¹⁹	GJMC	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Blairholm ¹⁹	GJMD	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Blairlogie ⁴⁰	GBJS	100	—	300, 450, 600	P G	X	0.40	—	Great Britain
Blairmore ¹⁹	BOB	145	—	300, 600	P G	X	0.40	—	Great Britain
Blakeley ^{9 121}	WNUE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Blanco	CAH	—	Navy	—	P G	—	—	—	Chile
Blas de Lezo ¹	TIN	100	José Marie Caballero, S. Sebastian	300, 600	P G	N	0.30	3.00	Spain
Blenda	SBX	—	Navy	—	O	—	—	—	Sweden
Blenheim	GEXR	—	Netherlands	—	P G	—	—	—	Great Britain
Blijdenfijk ¹	TZQ	200	Stoomvaart Maatschappij, Holland	300, 450, 600, 800	P G	X	0.40	4.00	Holland

Line	Ship	Company	Port of Origin	Port of Destination	Agent	Remarks
1	Bloemfontein	GBN	150	250	200	135
2	Bloemfontein	TZM	250	200	200	150
3	Blois	FRO	200	200	200	150
4	Blommersdijk	TZT	200	200	200	150
5	Bloomfield	LSU	135	200	200	150
6	Blossom Heath	CJO	150	200	200	150
7	Bluebell	GEYR	200	200	200	150
8	Blue Point	KDLU	200	200	200	150
9	Blue Triangle	KUGS	300	200	200	150
10	Bluffton	KEKZ	200	200	200	150
11	Blythmoor	GJKQ	200	200	200	150
12	Bobolink	NJJ	200	200	200	150
13	Bocaina	PVR	150	200	200	150
14	Bochum	DUM	400	200	200	150
15	Bockenheim	DBZ	200	200	200	150
16	Boden SFW	SFW	150	200	200	150
17	Boden DDN	DDN	150	200	200	150
18	Bodia	SMM	150	200	200	150
19	Bodnant	YCO	250	200	200	150
20	Boeoe	PHK	250	200	200	150
21	Boeton	PGU	250	200	200	150
22	Boeuf	FAQB	250	200	200	150
23	Bogen	AOAQ	250	200	200	150
24	Boggs	NAMT	250	200	200	150
25	Bogota YAC	YAC	180	200	200	150
26	Bogota KORQ	KORQ	200	200	200	150
27	Bogstad	TTQ	150-200	200	200	150
28	Bohemian Club	KDTB	200	200	200	150
29	Bois de Beaumarais	FOR	150	200	200	150
30	Bois des Buttes	FBY	200	200	200	150

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radiogram.	
Bois des Caures ¹	FOO	200	Société Anonyme de Pêche et d'Armement de l'Ouest, La Rochelle	300, 600	PG ..	X	0.40	—	France
Boklund ¹	ASV	200	(Armateurs) S. Ugelstad & Co., Brevik	300, 600	PG ..	X	0.40	4.00	Norway
Bolama ⁴¹	CSO	100-150	—	300, 600	PG ..	X	0.40	4.00	Portugal
Boldway ¹⁹	BJV	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Bolette ¹	ASP	100-125	(Armateurs) Fred Olsen & Co., Christiania	300, 600	PG ..	X	0.40	4.00	Norway
Bollingbroke ¹⁸	BGE	170	—	300, 600	PG ..	X	0.40	—	Great Britain
Bollivar ¹⁰²	KIQP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Bolivia ⁴⁰	—	—	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	—	—	—	—	—	Denmark
Bolivian ¹⁹	GCNB	—	Rederaktiebolaget Svenska Lloyd, Gothenburg	300, 600	PG ..	X	0.40	—	Great Britain
Bolivia SMT ¹	SMT	150	—	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Bolivier ¹⁶	ORV	150-200	Lloyd Royal Belge, Antwerp	300, 600	PG ..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Belgium
Bolmen ¹	SHA	250	Rederaktiebolaget Transatlantic, Gothenburg, Scandinavia-South Africa-Australia-Dutch East Indies and America Line	300, 600	P	—	—	—	Sweden
Bologna ¹⁷	ITB	190	La Veloce Società de Navigazione, Rome	300, 600	PG ..	X	0.40	—	Italy
Bolsena ¹⁷	ILA	140	Società Italiana de Servizi Marittimi, Rome	300, 600	PG ..	X	0.40	—	Italy
Boltenhof ²⁵	DLT	200	—	300, 600	PG ..	X	0.40	4.00	Germany
Bolton Castle ¹⁹	MAQ	150	—	300, 600	PG ..	0600 to 0800 0900 to 1200 1400 to 1600 2000 to 2200	0.40	—	Great Britain
Bolzaneto ¹⁷	IOK	140	Lloyd del Mediterraneo Società di Navigazione, Rome	300, 600	PG ..	X	0.40	—	Italy

Cable Station

CSCV

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Shipboard Stations

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Ship	YHR	250	400	300, 600	P G	0.20 ⁸	0.40 ⁸	0.40 ⁸	Commonwealth
Bombay Maru ¹	JHU	400	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600, 1,800	P G	0.40	—	—	Japan
Bondowoso ¹	PFO	200	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 600, 800	P G	0.40	4.00	—	Holland
Bompata ¹⁹	GFCV	—	—	300, 600	P G	0.40	—	—	Great Britain
Boobour ⁶⁰	GCTS	300	—	300, 450, 600	P G	0.40	—	—	Great Britain
Bonifaz	EBR	220	Navy	—	O	—	—	—	Spain
Bonne Brook ⁹⁷	KDGG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40	—	—	United States of America
Bonny ¹⁹	XIN	160	—	300, 600	P G	0.40	—	—	United States of America
Boobyalla	KUGC	300	Ocean Motorship Co.	300, 600	P G	0.40	—	—	United States of America
Boomborg	TYZ	150	Stoomboot Maatschappij Hillegersberg, Amsterdam	300, 600	P G	0.40	4.00	—	Holland
Boonah ¹	VJQ	325	—	300, 600	P G	0.40	—	—	Australian Commonwealth
Booral ¹²	CGH	240	—	300, 600	P G	0.40	—	—	Australian Commonwealth
Boorara ¹²	VJT	325	—	300, 600	P G	0.40	—	—	Australian Commonwealth
Borda ¹⁹	MFQ	220	Société Maritime Auxiliare de Transports, Nantes	300, 600	P G	0.40	—	—	Great Britain
Borde ¹⁹	GFMR	—	—	300, 450, 600	P G	0.10 ⁸⁷	1.00 ⁸⁷	—	Great Britain
Bordeaux ¹	FRD	200	—	300, 600	P G	0.40	—	—	France
Border ¹⁹	GCL	150	—	300, 600	P G	0.40	—	—	Great Britain
Borderland ¹⁹	MUM	—	—	300, 600	P G	0.15 ⁸⁸	1.50 ⁸⁸	—	Great Britain
Boreas AMH ¹	AMH	175	Navy	—	O	—	—	—	Germany
Borealis ¹⁹	GCWM	—	Rederiaktiebolaget Gothenburg	300, 600	P	0.40	—	—	Great Britain
Boren ¹	SDT	250	—	300, 600	P	0.40	4.00	—	Sweden

(local mean time)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country
							Per Word.	Minimum per Radiogram.	
Boreas NALM ¹⁰² Borg ¹	NALM SKY	— 150 ..	— Rederiaktiebolaget Iris, Stockholm (D.C.)	300, 600 300, 600	P G .. P ..	N 0800 to 0830 1200 to 1230 2000 to 2030	— 0.40	— 4.00	United States of America Sweden
Borges ²	WKEU	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Borje ⁹⁹	NULL	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹¹	—	United States of America
Borgestad ¹	LDZ	150	(Armateurs) A/S Borgestad (G. Knudsen), Porsgrund	300, 600	P G ..	X	0.40	4.00	Norway
Borghild ¹	ARA	150-175	(Armateurs) Torp et Wiese, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Borgholm ¹	AWP	150-175	(Armateurs) A/S Borgaa, Pettet Olsen, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Borgland ¹	LGW	150-200	(Armateurs) Fred Olsen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Borglum ⁴⁰	OGFA	350	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Bornida ¹⁷	IOO	140	Societa Italiana de Servizi Marittimi, Rome	300, 600	P G ..	X	0.40	—	Italy
Borneo ¹	PHY	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Borneo Maru JCL ¹	JCL	500	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Borneo Maru JPB ¹	JPB	400	Nanyo Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—	Japan
Borodino ¹⁹	ODT	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Bonulus ¹⁰ Boschdijk ¹	GFJN TZO	— 200 ..	Nederlandsche — Amerikaansche Stoomvaart Maatschappij, Holland — Amerika Lijn, Rotterdam	300, 450, 600 300, 450, 600, 800	P G .. P G ..	X X	0.40 0.40	— 4.00	Holland Great Britain
Bosporus ³⁵	DTE	200	Reederei, F. G. Reinhold Danzig	300, 450, 600, 800	P G ..	X	0.40	4.00	Danzig (Free Town of)
Bosporus ³² Bosnia ¹⁹	DPU	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Bosnian ⁷¹	GFXS OEL	— 120	Operated by Oliver & Co., Ltd., 1, Billiter Avenue, London, E.C.3	300, 450, 600 300, 600	P G .. P G ..	X X	0.40 0.40	—	Great Britain Great Britain
Bosphore ¹	FIB	400	Compagnie des Messageries Mar-	300, 600	P G ..	— ²⁷	0.40	—	France

Boston Bridge ^{9 131}	..	KINS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Boston City ¹⁹	..	GDSB	—	New England Steamship Company, Fall River (Mass.)	300, 600	P G	..	X	0.40 112	—	Great Britain
Boston KKA ^{9 131}	..	KXA	75	Kokusai Kisen Kaisha	300, 550, 600	P G	..	N	0.15	—	United States of America
Boston Maru ¹	..	JMC	400	Navy	300, 600	P G	..	..	0.40	—	Japan
Boston NGC ⁹⁹	..	NGC	—	Navy	300, 800	P G	..	..	0.20 111	—	United States of America
Boswell ¹⁹	..	GCTV	400	—	300, 600	P G	..	X	0.40 112	—	Great Britain
Bosworth ¹⁹	..	YJM	—	Aktieselskabet det Danske Kulkompagni, Copenhagen	300, 600	P G	..	X	0.40	—	Great Britain
Bothal ⁴⁰	..	OHG	150	—	300, 450, 600, 800	P G	..	X	0.40	4.00	Denmark
Bothwell BMK ¹⁹	..	BMK	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Bothwell NEKD ¹⁰²	..	NEKD	—	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 600	P G	..	X	—	—	United States of America
Botnia ⁴⁰	..	OXU	200	Navy	300, 450, 600	P G	..	X	0.40	4.00	Denmark
Boulrier	..	FBOU	—	Compagnie des Chargeurs Réunis, Paris	300, 800	P G	..	N	0.05	—	France
Bougainville ¹	..	FCB	200	—	300, 600	P G	..	X	0.40	—	France
Boukadra ¹⁹	..	YGB	145	—	300, 600	P G	..	X	0.40	—	Great Britain
Boulac ¹⁹	..	YPM	—	—	300, 450, 600	P G	..	X	0.40	—	Great Britain
Boulama ¹⁹	..	YMJ	160	—	300, 600	P G	..	X	0.40	—	Great Britain
Bound Brook ⁹⁷	..	KIFQ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Bourdonnals (La) UDU ¹	..	UDU	400	Compagnie Générale Transatlantique, Paris	300, 450, 600	P G	..	..	0.40	—	France
Bourges ¹	..	FRK	200	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	..	X	0.40	—	France
Bournemouth ¹⁹	..	ZJD	145	Navy	300, 600	P G	..	X	0.40	—	Great Britain
Boussole	..	FBWG	—	—	600, 800	P G	..	N	0.05	—	France
Bout-Dehors	..	FABR	—	Navy	300, 800	P G	..	N	0.05	—	France
Boutry ¹⁹	..	YZZ	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Bovenkerk ¹	..	HDN	200	Verenigde Nederlandsche Scheepvaartmaatschappij, Holland - Britsch Indie Lijst, Rotterdam	300, 450, 600, 800	P G	..	X	0.40	4.00	Holland
Boverie ¹⁹	..	YNY	135	—	300, 600	P G	..	X	0.40	—	Great Britain
Boverton ¹⁹	..	XHK	145	—	300, 600	P G	..	X	0.40	—	Great Britain
Bövrä ¹	..	TUI	300	(Armateur) Hans Hauson, Christiania	300, 600	P G	..	X	0.40	4.00	Norway
Bowdoin ²	..	KDIO	—	McMillan Arctic Expedition	—	P G	..	—	—	—	United States of America
Boyce ¹⁰²	..	GBRY	—	—	300, 600	P G	..	N	0.40	—	United States of America
Boyd	..	NISD	—	Navy	300, 600	P G	..	—	—	—	Great Britain
Boyd GKAD	..	GKAD	—	Waldo H. Brown	300, 600	P G	..	X	0.40	—	Great Britain
Boyd ZUY ¹⁹	..	ZUY	145	(Armateurs) Nilsen & Sønner, Christiania	300, 600	P G	..	X	0.40	—	United States of America
Poy Scout	..	KDYG	100-150	—	300, 600	P G	..	—	—	—	Norway
Braa ¹	..	TUQ	—	—	300, 600	P G	..	—	—	—	Great Britain
Brabander ¹⁹	..	EUM	140	Alaska Steamship Company, 1107, Colman Building, Seattle (Wash.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Brabant KUU ¹⁰³	..	KUU	200	—	300, 600	P G	..	X	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Brabant ONB ¹⁰	..	100-750	Compagnie Nationale Belge de Transports Maritimes, Antwerp (Armateurs) Fred Olsen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	Belgium
Brabant TUS ¹	..	200-250	Bureau Wijsmuller, Scheepvaart-Transporten Zeesleepvaart, Maatschappij, The Hague	300, 600	P G ..	X	0.40	4.00	Norway
Brabant TYT ¹	..	200	Societa Italiana di Servizi Marittimi, Rome	300, 600	P G ..	X	0.40	4.00	Holland
Bracciano ¹⁷	..	140	—	300, 600	P G ..	X	0.40	—	Italy
Bradavon ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Bradburn ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Bradyde ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Braddock ^{9 181}	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Bradford ^{9 181}	..	300	Standard Oil Co. of New Jersey, incorpor. 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Bradford City ¹⁹	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Braemar Castle ¹⁹	..	260	—	300, 600	P G ..	N	0.40	—	Great Britain
Braga ¹	..	300	Compagnie Française de Navigation à Vapeur Cyprien Fabre et Cie., Marseilles	300, 450, 600	P G ..	N	0.40	—	France
Bragança ¹⁵	..	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Braheholm ¹	..	250	Aktiebolaget Svenska Amerikanska Mexico Linien, Gothenburg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40 0.40	4.00	Sweden
Brambleleaf ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Brannell Point ^{9 181}	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Branch ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Branksome Hall ¹⁹	..	200	(Armateurs) A/S Braat (H. Rachelew), Sandefjord	300, 600	P G ..	X	0.40	—	Great Britain
Brann ¹	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	4.00	Norway
Brandywine ¹⁰⁵	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Brasher ^{9 181}	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

Shipboard Stations

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Ship	IED	190	Transoceania Società di Navigazione, Naples	300, 600	P G	N	0.40	Italy
Brasile ¹⁷	..	190	Transoceania Società di Navigazione, Naples	300, 600	P G	N	0.40	France
Brasilia ¹	..	250	Transports Maritimes de l'Etat (Armateurs) A/S	300, 600	P G	— ²⁷	0.40	Norway
Bratland ¹	..	75-100	Porsgrund A/S	300, 600	P G	X	0.40	Norway
Bratsberg ¹	..	165-323	(Armateurs) A/S	300, 600	P G	X	0.40	Norway
Brattingborg ⁴⁰	..	300	(G. Knudsen), Porsgrund	300, 450, 600,	P G	X	0.40	Denmark
Bratton Castle ¹⁹	..	—	Akkeselskabet Dampskibsselskabet	300, 450, 600,	P G	X	0.40	Great Britain
Braunfels ¹⁸	..	—	Danneborg, Copenhagen	300, 600	P G	X	0.40	Great Britain
Braunschweig ¹	..	—	Navy	—	O	N	—	Germany
Brave	..	—	Navy	300, 800	P G	N	0.05	France
Brave Cœur ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Braywood ¹⁹	..	125	Conta & Cia, Rio de Janeiro	300, 600	P G	X	0.15 ⁸²	Great Britain
Brazilera ¹⁸	..	100	(Armateurs) Fred Olsen & Co.,	300, 600	P G	N	0.40	Brazil
Brazil LEQ ¹	..	150-200	Christiana	300, 600	P G	X	0.40	Norway
Brazil PVN ¹⁵	..	150	Companhia Lloyd Nacional, Rio de Janeiro	300, 600	P G	N	0.40	Brazil
Brazil SRM ¹²	..	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	Brazil
Braziliana ¹⁹	..	—	—	300, 450, 600	P G	X	0.40	Great Britain
Brazilier ¹⁹	..	150	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100	0.40	Great Britain
Brazil Maru ¹	..	500	—	300, 600	P G	1400 to 1700	0.40	Japan
Brea (La) ¹⁰¹	..	300	Union Oil Co. of California, Oleum (Cal.)	300, 600, 1,800	P G	X	0.40 ¹²²	United States of America
Breck ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹	United States of America
Breckinridge ⁹⁹	..	—	Navy	300, 600	P G	N	0.40 ¹¹²	United States of America
Breconian ¹⁹	..	120	(Armateurs) Fred Olsen & Co.,	300, 600	P G	X	0.20 ¹¹¹	United States of America
Breda LHM ¹	..	75-100	Christiana	300, 600	P G	X	0.40 ¹¹²	Great Britain
Breda TWU ¹	..	200	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 450, 600,	P G	X	0.40	Norway
Bredijk ¹	..	200	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600,	P G	X	0.40	Holland
Brees ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹	United States of America
Brei ¹	..	200	(Armateur) Harald Hansen, Skten	300, 600	P G	X	0.40 ¹¹²	Norway
Breifond ¹	..	200-250	(Armateurs) Sigval Bergesen, Stavanger	300, 600	P G	X	0.40	Norway
Brez-Izel ¹	..	150	Société des Chargeurs de l'Ouest, Nantes	300, 600	P G	X	0.40	France
Brema ³⁵	..	200	—	300, 450, 600	P G	X	0.40	Germany
Bremen ¹⁰	..	100-150	Association Maritime Belge, Antwerp	300, 600	P G	X	0.40	Belgium
Bremerhaven ³⁵	..	200	—	300, 600	P G	X	0.40	Germany

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Brenersvold ⁴⁰	OHZ	200	Aktieselskabet Dampskibsselskabet Rødby, Havn, Rødby	X	0.40	4.00	Denmark
Bremerton ¹⁰³	..	200	WSZ	200	U.S. Shipping Board, Washington (D.C.)	X	0.40	—	United States of America
Brendon ¹⁹	..	135	BEK	135	Navy	X	0.40	—	Great Britain
Brennero ¹⁷	..	190	IJD	190	Genoa	X	0.40	—	Italy
Brenta IAF ¹⁷	..	190	IAF	190	Navigazione Generale Italiana, Genoa	X	0.40	—	Italy
Brenta IVL ¹⁷	..	190	IVL	190	Navigazione Libera Triestina, Trieste	X	0.40	—	Italy
Brescia ¹⁹	..	165	ESS	165	—	X	0.40	—	Great Britain
Breslau ¹⁹	..	—	GFCN	—	—	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Bretagne ¹⁹	..	—	FAHB	—	Navy	N	0.05	—	France
Bretanier ¹⁹	..	140	EXP	140	—	X	0.40	—	Great Britain
Bretland ⁴⁰	..	200	OHR	200	Aktieselskabet Det Nanske Kul- kompagniet, Copenhagen	X	0.40	—	Denmark
Bretta ¹	..	300	TUF	300	(Armateur) Haus Hanson, Christiania	X	0.40	4.00	Great Britain
Bretwalda ¹⁹	..	170	GBIR	170	—	X	0.40	—	Norway
Brevard ¹⁹	..	—	KEPJ	—	U.S. Shipping Board, Washington (D.C.)	X	0.40	—	United States of America
Breynton ¹⁹	..	145	LSZ	145	—	X	0.40	—	Great Britain
Briarchiff ¹⁹	..	—	KEPK	—	U.S. Shipping Board, Washington (D.C.)	X	0.40	—	United States of America
Bridge ⁸⁹	..	—	NOI	—	Navy	N	0.20 ¹¹¹	—	United States of America
Bridgeport ⁸⁹	..	—	NGR	—	Navy	N	0.40 ¹¹²	—	United States of America
Bridgetown ¹⁰³	..	200	KUCZ	200	U.S. Shipping Board, Washington (D.C.)	X	0.20 ¹¹¹	—	United States of America
Brielle ¹	..	200	TWT	200	300, 450, 600	X	0.40	—	United States of America
Brior ¹⁹	..	—	GDVJ	—	300, 600	X	0.40	4.00	Holland
Brighton BNF ¹⁹	..	130	BNF	130	Koninklijke Nederlandsche Stoom- vaart, Maatschappij, Amsterdam	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Brighton MOV ⁷¹	..	95	MOV	95	R. Chapman & Son	X	0.40	—	Great Britain
Brilliant ^{9 131}	..	150	KTI	150	London, Brighton & South Coast Railway Company	X	0.10 ⁸²	1.00 ⁸²	Great Britain
					Standard Oil Company of New York, Incorporated, 26, Broad-		0.20 ¹¹¹	—	United States of America
							0.40 ¹¹²	—	

Brindley # 121	KTZ	300	Standard Oil Company of New Jersey, Incorporated, 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	United States of America
Brindisi	IHH	—	Navy	—	O ⁴	—	—	Italy
Brinio	PAV	—	Navy	300, 450, 600, 800	—	—	—	Holland
Bris ¹	SHT	250	Rederiaktiebolaget Bore, Gothenburg	300, 600	P	—	0.40	Sweden
Brisbane	GABH	—	Navy	—	—	—	—	Australian Commonwealth
Brise (La) ¹	UJR	150	Maurice Bernard (Armateur), Boulogne-sur-Mer	300, 600	P G	—	0.40	France
Briseis ¹	ULC	300	Compagnie Auxiliaire de Navigation	300, 600	PG	—	0.40	France
Brigavlia ¹	UFN	200	Transports Maritimes de l'Etat	300, 600	P G	— ²⁷	0.40	France
Bristol # 131	KEGC	300	Coastwise Transportation Co., 40, Central Street, Boston (Mass.)	300, 450, 600	P G	—	0.40	United States of America
Bristol City ¹⁹	GDML	—	Compagnie Française de Navigation à Vapeur, Cyprien Fabre & Cie, Marseilles	300, 600	P G	—	0.40	Great Britain
Britannia FJG ¹	FJG	200	Eastern Telegraph Company, Ltd. P. & A. Campbell, Ltd.	300, 600	P G	—	0.40	France
Britannia GCRB ⁷¹	GCRB	140	—	300, 450, 600	P	—	0.40	Great Britain
Britannia GNFP ¹⁹	GNFP	—	—	300, 450, 600	P G	—	1.00 ⁸⁷	Great Britain
Britannic ¹⁹	YTD	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Admiral ¹⁹	ZVY	190	—	300, 600	P G	—	0.40	Great Britain
British Advocate ¹⁹	GJLM	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Architect ¹⁹	GJNP	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Baron ¹⁹	EYU	200	—	300, 450, 600	P G	—	0.40	Great Britain
British Beacon ¹⁹	BOU	—	—	300, 600	P G	—	0.40	Great Britain
British Birch ¹⁹	EYD	155	—	300, 600	P G	—	0.40	Great Britain
British Chancellor ¹⁹	GFVN	—	—	300, 600	P G	—	0.40	Great Britain
British Colonel ¹⁹	GFDB	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Commander ¹⁹	GJKV	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Commerce ¹⁹	GJMS	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Commodore ¹⁹	GJNQ	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Corporal ¹⁹	GJFV	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Councillor ¹⁹	GJKT	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Duke ¹⁹	EYV	170	—	300, 600	P G	—	0.40	Great Britain
British Earl ¹⁹	EYS	140	—	300, 600	P G	—	0.40	Great Britain
British Emperor ¹⁹	ZLK	175	—	300, 600	P G	—	0.40	Great Britain
British Empress ¹⁹	ZVZ	160	—	300, 600	P G	—	0.40	Great Britain
British Engineer ¹⁹	GJLN	—	—	300, 600	P G	—	0.40	Great Britain
British Ensign ¹⁹	ZVY	150	—	300, 450, 600	P G	—	0.40	Great Britain
British Enterprise ¹⁹	GFXW	—	—	300, 600	P G	—	0.40	Great Britain
British Fern ¹⁹	EZE	—	—	300, 450, 600	P G	—	0.40	Great Britain
British General ¹⁹	GJLB	—	—	300, 600	P G	—	0.40	Great Britain
British Grenadier ¹⁹	GFST	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Gunner ¹⁹	GFVS	—	—	300, 450, 600	P G	—	0.40	Great Britain
British Holly ¹⁹	EZJ	—	—	300, 600	P G	—	0.40	Great Britain
British Industry ¹⁹	GJKC	—	—	300, 450, 600, 800	P G	—	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
British Isles ¹⁹	ZYW	150	—	300, 600	P G	X	0.40	—	Great Britain
British Judge ¹⁹	GFVP	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Knight ¹⁹	EYN	130	—	300, 600	P G	X	0.40	—	Great Britain
British Lantern ¹⁹	BON	140	—	300, 600	P G	X	0.40	—	Great Britain
British Light ¹⁹	BOD	120	—	300, 600	P G	X	0.40	—	Great Britain
British Major ¹⁹	BLN	160	—	300, 600	P G	X	0.40	—	Great Britain
British Maple ¹⁹	EYB	—	—	300, 600	P G	X	0.40	—	Great Britain
British Mariner ¹⁹	GJFW	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Marquis ¹⁹	EYX	150	—	300, 600	P G	X	0.40	—	Great Britain
British Marshall ¹⁹	YIJ	—	—	300, 600	P G	X	0.40	—	Great Britain
British Officer ¹⁹	GLRN	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Peer ¹⁹	EYM	150	—	300, 600	P G	X	0.40	—	Great Britain
British Princess ¹⁹	ZYT	180	—	300, 600	P G	X	0.40	—	Great Britain
British Rose ¹⁹	EOC	190	—	300, 600	P G	X	0.40	—	Great Britain
British Sailor ¹⁹	OFK	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Sergeant ¹⁹	GILQ	—	—	300, 600	P G	X	0.40	—	Great Britain
British Soldier ¹⁹	YOR	140	—	300, 600	P G	X	0.40	—	Great Britain
British Sovereign ¹⁹	ZAU	150	—	300, 600	P G	X	0.40	—	Great Britain
British Star ¹⁹	BOI	150	—	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
British Tommy ¹⁹	GFOL	—	—	300, 450, 600, 2,100, 2,200,	P G	N	0.40	—	Great Britain
British Trade ¹⁹	GJMP	—	—	2,400	P G	X	0.40	—	Great Britain
British Trader ¹⁹	GFVQ	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Transport ¹⁹	ZDT	145	—	300, 600	P G	X	0.40	—	Great Britain
British Vine ¹⁹	EPK	—	—	300, 600	P G	X	0.40	—	Great Britain
British Viscount ¹⁹	GFDY	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
British Workman ¹⁹	GJFX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Briton ²⁰	MOJ	350	—	300, 450, 600	P G	N	0.40	—	Holland
Britsum ²⁰	TYV	150	—	300, 600	P G	X	4.00	—	Holland
Brivet ¹	ULV	250	Stoomvaart Maatschappij Oostzee, Amsterdam	300, 450, 600	P G	X	0.40	—	France
Broad Arrow ^{9 131}	KSY	300	Ballas & Mahé, Quai Rohan, Lorient	300, 450, 600	P G	N	0.40	—	United States of America
Brockdale ¹⁹	LUI	—	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	Great Britain
Brockfield ¹⁹	GBDX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Brocklesby ¹⁹	GOTT	—	—	300, 600	P G	X	0.40	—	Great Britain

Shipboard Stations

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	KNH	50	Colonial Navigation Company, Pier 39, North River, New York (N.Y.)	300, 600	P G	N	0.15 117	United States of America
Brockton 164								
Brocktown 19	GCXJ	—	—	300, 600	P G	X	0.40	Great Britain
Brodsworth 19	ESE	140	—	300, 600	P G	X	0.40	Great Britain
Broke	GBBS	—	—	—	P G	X	—	Great Britain
Bromma 1	TUL	200	Navy (Armateur) Hans Christiana	300, 600	P G	X	4.00	Norway
Bronte GCPZ	GCPZ	—	—	300, 600	P G	X	0.40	Great Britain
Bronte IGA	IGA	—	—	—	—	—	—	Italy
Brontdale 97	WNWO	200	Crosby Marine Corporation	300, 600	P G	X	0.30	United States of America
Brookline 97	KURT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	United States of America
Brooks 98	NEZX	—	Navy	300, 600	P G	N	0.20 111 0.40 112	United States of America
Brookvale 19	BRB	—	—	300, 600	P G	X	0.40	Great Britain
Brookway 19	BGH	—	—	300, 450, 600	P G	X	0.40	Great Britain
Broom 99	NEPF	—	Navy	300, 600	P G	N	0.20 111 0.40 112	United States of America
Brösen 1	AMK	—	Navy	—	Q	N	0.40	Germany
Browning 19	GEBL	—	—	300, 600	P G	X	0.40	Great Britain
Bruce GEKI	GEKI	—	—	—	P G	X	—	Great Britain
Bruce NUPS 102	NUPS	—	U.S. Navy	300, 600	P G	N	—	United States of America
Bruges 71	GDWJ	—	Great Eastern Railway Company	300, 450, 600	P G	N	0.10 87	Great Britain
Brunar	FAKU	—	Navy	300, 800	P G	N	0.05	France
Brunette 17	USW	140	Radio Frausin Società Armatrice, Trieste	300, 600	P G	X	0.40	Italy
Brünhilde 35	DBA	200	—	300, 450, 600	P G	X	0.40	Germany
Brunswijk 1	PIV	150	Maatschappij Stoomchip wijk (Direction: Erhardt Dekkers), Rotterdam	300, 600	P G	X	0.40	Holland
Bruse 16	LHO	75-100	(Armateurs), Norges Statsbaner, Fred Olsen & Co., Christiania,	300, 600	P G	X	0.40	Norway
Bruselas 1	LQB	135	Nicolás Mihanovich Compania, Ltd., Buenos Aires	300, 600	P G	N	0.40	Argentine Republic
Brush 97	KDHV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Brussel 1	LHN	100-150	(Armateurs) Fred Olsen & Co., Christiania	300, 600	P G	X	0.40	Norway
Brutus 99	NNA	—	Navy	300, 600	P G	N	0.20 111 0.40 112	United States of America
Bryere 19	GCBM	—	—	300, 600	P G	X	0.40	Great Britain
Bryderen 40	OYW	50	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 600	P G	X	0.40	Denmark
Brynild 40	—	—	Aktieselskabet Dampskibsselskabet Valkyrien, Copenhagen	—	—	—	—	Denmark
Brynhilda 9 121	KTO	150	Cosmopolitan Shipping Company, 115, Broadway, N.Y.	300, 450, 600	P G	X	0.40	United States of America
Bryntawe 19	BSR	140	—	300, 600	P G	X	0.40	Great Britain
Brynmor 20	GFVV	100	—	300, 600	P G	X	0.15	Great Britain
Bryony	GKAS	—	Navy	—	P G	X	—	Great Britain
Bubendey 25	DEV	120	—	300, 600	P G	X	0.40	Germany
Buccaner 9 131	KFO	150	Sinclair Navigation Company, 120, Broadway, New York	300, 450, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Buccinum ¹⁶	GCQP	—	—	300, 600	P G	X	0.40	—	Great Britain
Bucchi ..	CVG	250	Marine Department of the Roumanian Government	450, 600, 800	O ..	N	—	—	Roumania
Buchanan ¹⁸	NEQS	—	.. ..	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Buchanness ¹⁹	ZIO	—	—	300, 600	P G	X	0.40 ¹¹²	—	Great Britain
Buckeye State ²⁷	KDRW	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G ..	N	0.40	—	United States of America
Buckhannon ²⁷	KELG	—	Gulf and Southern Steamship Company, Jacksonville (Fla.)	300, 600	P G ..	X	0.20	—	United States of America
Buckleigh ¹⁹	BDY	160	Lloyd Triestino Società di Navigazione a Vapore, Trieste	300, 600	P G ..	X	0.40	—	Great Britain
Bucovina ¹⁷	IYG	140	Marine Department of the Roumanian Government	300, 600	P G ..	X	0.40	—	Italy
Bucuresti ..	CVB	150	Transports Maritimes de l'Etat (Armateurs) Nieuwejaar Hansen, Bergen	300, 600	O ..	N	—	—	Roumania
Buda ¹ ..	UFQ	180	Transports Maritimes de l'Etat & (Armateurs) Nieuwejaar	300, 600	P G ..	X	0.40	—	France
Buckland ¹ ..	ARU	300	Hansen, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Buenos Aires EDB ¹	EDB	269	Compania Transatlantica, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Buenos Aires LKC ¹	LKC	—	Navy	450, 600	O ..	N	—	—	Argentine Republic
Buenos Aires SIU ¹	SIU	350	Raderikthebolaget Nordstjernan (Johnson Line), Stockholm. Sweden—coast of the Pacific Line	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Buenos Aires UDC	UDC	300	Transports Maritimes de l'Etat	300, 600	P G ..	— ²⁷	0.40	—	France
Buffalo ²⁰ ..	NCU	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Buffalo Bridge ¹⁰³	KIZF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40 ¹¹²	—	United States of America
Buford WXA ² ..	WXA	300	U.S. Signal Corps, War Dept., Washington (D.C.)	300, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Buino ..	FAXT	—	Navy	600, 800	P G ..	N	0.05	—	France
Buitenzorg ¹	PHU	150	Stoomvaart Maatschappij Rotterdamse Lloyd, Amsterdam	300, 600, 800	P G ..	X	0.40	4.00	Holland
Bulgaria ¹⁷	IOP	140	Società Italiana di Servizi Marittimi, Rome	300, 600	P G ..	X	0.40	—	Italy
Bulgarian ¹⁹	GBYV	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain

Bulla ¹	VJP	250	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	Australian Commonwealth
Bullaren ¹	SHN	250	—	300, 600	P	0930 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Bulmer ¹⁰² Buninyong ¹	NUPN VIQ	— 300	— —	300, 600 300, 600	P G P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	— 0.20 ⁸ 0.40 ⁵	— —	United States of America Australian Commonwealth
Bur ¹	TQB	150-200	—	300, 600	P G	—	0.40	4.00	Norway
Buranda ¹⁹	LSY	145	—	300, 600	P G	X	0.40	—	Great Britain
Burdale ¹⁰	XFM	120	—	300, 600	P G	X	0.40	—	Great Britain
Burgerdijk ¹	IZP	200	—	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Burgermeister von Melle ¹ Burgondier ²⁹	UFO OEZ	250 —	— —	300, 600 300, 600	P G P G	— ²⁷ X	0.40 0.40	— —	France Great Britain
Burgundy ¹⁹ Burma GVT ⁷¹	BDM GVT	170 150	— —	300, 600 300, 450, 600	P G P G	X 1000 to 1200 1400 to 1600 2000 to 2400 0800 to 1100 1400 to 1700 2000 to 2400	0.40 0.40	— —	Great Britain Great Britain
Burma Maru ¹	JYY	200	—	300, 600	P G	X	0.40	—	Japan
Burna UTW ¹⁷	UTW	140	—	300, 600	P G	X	0.40	—	Italy
Burnese Prince ¹⁹	GRP	200	—	300, 600	P G	N	0.40	—	Great Britain
Burnholme ⁷¹	ELV	—	—	300, 600	P G	X	0.40	—	Great Britain
Burnhope ¹⁹ Burns ⁹⁹	GXQ NAFS	— —	— —	300, 450, 600 300, 600	P G P G	X N	0.15 ⁸² 0.20 ¹¹¹ 0.40 ¹¹²	1.50 ⁸²	Great Britain United States of America
Burnside ^{2, ..}	WXR	100	—	300, 600	P G	—	—	—	United States of America
Burnwell ⁹ 131 Burrows ⁹⁹	KIMS NCV	— —	— —	300, 600 300, 600	P G P G	X N	0.20 ¹¹¹ 0.20 ¹¹¹ 0.40 ¹¹²	— — —	United States of America United States of America
Burslem ¹ Burutu ¹	GEYS YVC	— —	— —	300, 600	P G P G	X N	— 0.40	— —	Great Britain Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Burwah ¹	300	—	300 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ^s 0.40 ^s	—	Australian Commonwealth
Bury ⁷¹	—	Great Central Railway Company	300 600	P G ..	X	0.15 ^{s2} 0.20 ^{s11} 0.40 ^{s12}	1.50 ^{s2}	Great Britain United States of America
Bush ⁹⁹	—	Navy	300 600	P G ..	N	0.40 ^{s11} 0.20 ^{s11} 0.40 ^{s12}	—	United States of America
Bushnell ⁹⁹	—	Navy	300 600	P G ..	N	0.40 ^{s11} 0.40 ^{s12}	—	Japan
Bûsho Maru ¹	200	Osaka Shosen Kashiha (Osaka Mercantile Steamship Company)	300 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Holland
Bussum ¹	150	Stoomvaart Maatschappij Oostzee, Amsterdam	300 600	P G ..	X	0.40	4.00	Spain
Bustmante	140	Navy	—	O ..	—	—	—	Great Britain
Buteshire ⁷¹	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G ..	X	0.40	—	Great Britain
Butetown ¹⁹	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Buttercup ¹⁰³	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Butterfield ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Buyo Maru ¹	400	Asano Zosenjo	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Byeway ¹⁹	—	(Armateur) P. A. Musæus, Christiania	300, 450, 600	P G ..	X	0.40	—	Great Britain
Bygdo ¹	150-175	Petroleum and Transport Co., 1015, Security Building, Los Angeles (Cal)	300, 600	P G ..	X	0.40	4.00	Norway
Bylavl ²	200	Standard Oil Company of New Jersey, Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	—	—	United States of America
Byna ¹	300	—	300, 600	P G ..	X	0.40	4.00	Norway
Byron ¹⁹	250	—	300, 600	P G ..	N	0.40	—	Great Britain
Byron D. Benson ⁹¹³¹	300	—	300, 450, 600	P G ..	X	0.40	—	United States of America
Byvanton ¹	100-150	P. Pantaleon Fils, Piræus	300, 600	P G ..	X	0.40	4.00	Greece

C. 102	KXK	300, 600	PG	United States of America
C. 4	XXN	300, 600	PG	United States of America
C. 17	FARL	300, 800	PG	France
C. 25	FAZS	300, 800	PG	France
C. 27	FABZ	300, 800	PG	France
C. 28	FAYU	300, 800	PG	France
C. 30	FAGW	300, 800	PG	France
C. 32	FBHD	300, 800	PG	France
C. 33	HUR	300, 800	PG	France
C. 32	Transports Maritimes de l'Elat	300, 800	PG	France
C. 35	FAWO	300, 800	PG	France
C. 45	FAVY	300, 800	PG	France
C. 46	FBAK	300, 800	PG	France
C. 47	FBDZ	300, 800	PG	France
C. 49	FAIK	300, 800	PG	France
C. 50	FALP	300, 800	PG	France
C. 51	FAU	300, 800	PG	France
C. 53	FALK	300, 800	PG	France
C. 55	FAO	300, 800	PG	France
C. 56	FAHZ	300, 800	PG	France
C. 57	FATI	300, 800	PG	France
C. 58	FAYW	300, 800	PG	France
C. 60	FAZH	300, 800	PG	France
C. 62	FAMX	300, 800	PG	France
C. 63	FAXL	300, 800	PG	France
C. 65	FBNH	300, 800	PG	France
C. 66	FBVU	300, 800	PG	France
C. 67	FBOD	300, 800	PG	France
C. 68	FBZQ	300, 800	PG	France
C. 69	FBTU	300, 800	PG	France
C. 70	FAKX	300, 800	PG	France
C. 72	FBVI	300, 800	PG	France
C. 74	FBOW	300, 800	PG	France
C. 75	FAYG	300, 800	PG	France
C. 77	FARN	300, 800	PG	France
C. 79	FANW	300, 800	PG	France
C. 80	FAOZ	300, 800	PG	France
C. 81	FADK	300, 800	PG	France
C. 85	FBUX	300, 800	PG	France
C. 86	FBHD	300, 800	PG	France
C. 89	FBKZ	300, 800	PG	France
C. 90	FBDO	300, 800	PG	France
C. 91	FBOL	300, 800	PG	France
C. 92	FBZ	300, 800	PG	France
C. 94	FBMD	300, 800	PG	France
C. 95	FAIY	300, 800	PG	France
C. 96	FBW	300, 800	PG	France
C. 97	FBOK	300, 800	PG	France
C. 98	FBUG	300, 800	PG	France
C. 102	FBUM	300, 800	PG	France
C. 103	FBUN	300, 800	PG	France
C. 104	FBUN	300, 800	PG	France
C. 105	FBUN	300, 800	PG	France
C. 106	FBUN	300, 800	PG	France
C. 107	FBUN	300, 800	PG	France
C. 108	FEUR	300, 800	PG	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country
							Per Word.	Minimum Radiotelegram.	
C.109	..	—	Navy	600, 800	P G	N	0.05	—	France
C.110	..	—	Navy	600, 800	P G	N	0.05	—	France
C.111	..	—	Navy	600, 800	P G	N	0.05	—	France
C.112	..	—	Navy	600, 800	P G	N	0.05	—	France
C.113	..	—	Navy	600, 800	P G	N	0.05	—	France
C.114	..	—	Navy	600, 800	P G	N	0.05	—	France
C.115	..	—	Navy	600, 800	P G	N	0.05	—	France
C.116	..	—	Navy	600, 800	P G	N	0.05	—	France
Caballero ¹	..	300	(Armateurs) Bruun, & V. D. Lippe, Tonsberg	300, 600	P G	X	0.40	4.00	Norway
Cabanal ²	..	180	Compañia Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Cabedello	..	100	Lage & Irmãos, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Cabedello HPS ¹	..	400	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Cabegon ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cabo Carvoeira ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Cervera ¹	..	250	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Corrientes ¹	..	300	A. M. Delfino y Hermano, Buenos Aires	300, 600	P G	N	0.40	4.00	Argentine Republic
Cabo Creus ²	..	500	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Espartel ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Huertas ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Menor ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Ortigal ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Razo ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Roche ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Santa Maria	..	300	A. M. Delfino y Hermano, Buenos Aires	300, 600	P G	N	0.40	4.00	Argentine Republic
Cabo Socratif ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabotia ¹⁰	..	180	Navy	300, 600	P G	X	0.40	—	Great Britain
Caboto IGZ	..	—	Societa Veneziana di Navigazione a Vapore, Venice	—	—	X	—	—	Italy
Caboto ITJ ¹⁷	..	190	Societa Veneziana di Navigazione a Vapore, Venice	300, 600	P G	X	0.40	—	Italy
Cabo Tres Forcas ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabo Villano ¹	..	150	Ibarra y Compañia, Sevilla	300, 600	P G	N	0.30	3.00	Spain
Cabrille ¹⁰¹	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Cabrillo ¹⁰¹	..	150	Wilmington Transportation Co., 993, Pacific Electric Building, Los Angeles (Cal.)	300, 600	P G	X	0.40 ¹²⁴	—	United States of America

C. A. Canfield # 131	WH	300	Pan-American Petroleum and Transport Co., Incorp., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P. G.	X	0.40	United States of America
Cachapoal ¹¹	..	200	Cia Sud-Americana de Vapores, Calle Blanco 895, Valparaiso	300, 600	P. G.	X	0.40	Chile
Cachalot	—	Navy	—	P. G.	—	—	Great Britain
Cacique # 131	..	—	Grace Steamship Company, Inc., 7, Hanover Sq., New York (N.Y.)	300, 600, 1,800	P. G.	X	0.40	United States of America
Cadaretta #7	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P. G.	X	0.40	United States of America
Cadaro	..	140	Navy	—	O	—	—	Spain
Caddo # 131	..	300	Standard Oil Co. of New Jersey, Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P. G.	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Caddopeak ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P. G.	X	0.40	United States of America
Cadillac ¹⁹	..	160	Phillos Izquiero y Cia, Cadiz ..	300, 600	P. G.	X	0.40	Great Britain
Cadiz ¹	300	Lloyd Adriatico Società di Navigazione, Venice	300, 600	P. G.	X	0.30	Spain
Cadmore ¹⁰²	..	140	Navy	300, 600	P. G.	X	0.40	United States of America
Caesar #9	—	Sicilia Società di Navigazione, Rome	300, 600	P. G.	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Caesar II ¹⁹	..	—	U.S. Coast Guard ..	300, 450, 600	P. G.	X	0.40	Great Britain
Caesarea ¹⁹	..	250	—	300, 600	P. G.	X	0.40	Great Britain
Cagliari ¹⁷	..	140	—	300, 600	P. G.	X	0.10 ⁸²	Great Britain
Cahiracon ¹⁹	..	—	—	300, 450, 600	P. G.	X	0.40	Italy
Calabkia ¹²⁸	..	—	—	300, 600	P. G.	X	—	Great Britain
Calabkia ¹²⁸	..	350	—	300, 450, 600	P. G.	X	—	United States of America
Carnarvon ⁵⁰	..	170	—	300, 600	P. G.	X	0.40	Great Britain
Carringowan ¹⁹	..	155	—	300, 600	P. G.	X	0.40	Great Britain
Carrmona ⁵⁰	..	350	—	300, 450, 600	P. G.	X	0.40	Great Britain
Carndhu ⁵⁰	..	350	—	300, 450, 600	P. G.	X	0.40	Great Britain
Carnross ⁵⁰	..	350	—	300, 450, 600	P. G.	X	0.40	Great Britain
Carnvalona ⁵⁰	..	155	—	300, 600	P. G.	X	0.40	Great Britain
Cairo DCA ³⁵	..	200	—	300, 600	P. G.	X	0.40	Germany
Cairo GEDR	..	—	Navy	300, 600	P. G.	X	0.40	Great Britain
Cairo KDQW	..	—	Inland and Coastwise Waterways Service (Mississippi Warrior Service)	300, 600	P. G.	X	—	United States of America
Cairo WYDF ¹²⁵	..	350	—	450, 600, 900, 1,100	O	X	—	United States of America
Caithness ¹⁹	..	—	—	300, 600	P. G.	X	0.40	Great Britain
Calabria IKN	..	—	Navy	—	P. G.	—	—	Italy
Calabria MAJ ¹⁹	..	200	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P. G.	N	0.40	Great Britain
Calabria SMV ¹	150	—	300, 600	P	—	0.40	Sweden
Calchas ⁷¹	—	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P. G.	—	0.40	Great Britain
Calcutta GEDS	..	—	Navy	—	P. G.	—	—	Great Britain
Calais	—	Navy	300, 800	P. G.	N	0.05	France

Callspell ^{9 131}	150	KXIO	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Callabas ¹⁰³	200	WPUI	Callabas Steamship Corporation, 61, Broadway (N.Y.)	300, 450, 600	P G	X	0.40	United States of America
Callao ¹⁰³	150	WHF	J. H. Mahony	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Calliope GEDT	—	GEDT	Navy	—	P G	—	—	Great Britain
Calliope IAAAL	—	IAAL	Navy	—	P G	—	—	Italy
Callisto ¹	200	PYF	Maatschappij Zeevaart, Rotterdam	300, 450, 600, 800	P G	X	0.40	Holland
Calmar	—	FACB	Navy	300, 800	P G	N	0.05	France
Calno ¹⁰³	—	KINV	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Caloria ^{9 131}	300	KSP	Standard Oil Company of New Jersey, Incorporated, 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	United States of America
Caloric ¹	150-200	LED	(Armateur) Wilhelm Jensen, Bergen	300, 600	P G	X	0.40	Norway
Calulu ¹	240	VZV	—	300, 600	P G	—	—	Australian Commonwealth
Calvert ^{9 131}	300	WTUI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	United States of America
Calvin Austin ^{9 131}	150	KRN	Eastern S.S. Lines, India Wharf, Boston (Mass.)	300, 450, 600	P G	N	0.20	United States of America
Calypso GBFM ¹⁹	—	GBFM	Navy	300, 600	P G	X	0.15 ⁸²	Great Britain
Calypso GEDV	—	GEDV	Koninklijke Nederlandse Stoomboot Maatschappij, Amsterdam	300, 600	P G	—	—	Great Britain
Calypso TXB ¹	150	TXB	New York & Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 450, 600	P G	X	0.40	Holland
Camaguey ¹⁰³	300	KWI	A. M. Delfino y Hermano, Buenos Aires	300, 450, 600	P G	N	0.40	United States of America
Camarones ¹	300	LRC	Navy	300, 450, 600	P G	—	—	Argentine Republic
Camberley GEYV	—	GEYV	London & North-Western Railway	300, 600	P G	—	—	Great Britain
Camberley ZCS ¹⁹	—	ZCS	P. & A. Campbell, Ltd.	300, 600	P G	N	0.10 ⁸⁷	Great Britain
Cambria GDRV ⁷¹	—	GDRV	Eastern Telegraph Company	300, 450, 600	P G	X	0.10 ⁸⁷	Great Britain
Cambria GCG ¹⁹	170	MCG	Navy	300, 450, 600	P G	—	—	Great Britain
Cambria MCG ⁷¹	—	MCG	New York and New Orleans S.S. Co., Pier 39, North River, New York (N.Y.)	300, 550, 600	P G	N	0.40 ¹¹⁷	United States of America
Cambrian GEDX	180	GEDX	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	United States of America
Cambrian MNT ¹⁹	75	MNT	Lloyd Royal Belge, Antwerp	300, 600	P G	—	—	Belgium
Cambrian KGR ^{9 131}	300	KGK	Société des Chargeurs de l'Ouest, Nantes	300, 600	P G	—	—	France
Cambridge KIRR ^{9 131}	100-150	KIRR	United Fruit Tanker Corporation	300, 600	P G	X	0.40	United States of America
Cambrier ¹⁰	300	ORC	Eastern Steamship Lines, India Wharf, Boston (Mass.)	300, 600	P G	X	0.40	United States of America
Cambronne ¹	150	FAE	—	300, 600	P G	—	—	United States of America
Camden KDKL ⁹⁸	300	KDKL	—	300, 600	P G	X	0.40	United States of America
Camden KRC ^{9 131}	200	KRC	—	300, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.	Country.
Camden NAPR ¹⁸	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Camérata ¹⁹	..	135	—	300, 600	P G ..	X	—	Great Britain
Cameroon ²⁰	..	300	—	300, 450, 600	P G ..	N	0.40	Great Britain
Camilo ¹⁹	..	100	—	300, 600	P G ..	X	0.40	Great Britain
Camilla Gilbert ¹	..	150-200	(Amateur) Willy C. Gilbert, Bergen	300, 600	P G ..	X	0.40	Norway
Camira ¹	..	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	Australian Commonwealth
Camito ¹⁹	..	230	—	300, 600, 2,100, 2,200 C.W.	P G ..	X	0.40	Great Britain
Camouens ¹⁹	..	170	—	300, 600	P G ..	X	0.40	Great Britain
Camosun ²¹	..	200	Union Steamship Company of British Columbia, Vancouver (B.C.)	300, 600	P G ..	— ²⁷	0.40	Canada
Campania IKM	..	—	Navy	—	P G ..	—	—	Italy
Campania IVQ ¹⁷	..	190	Luigi Pattaluga, Genoa	300, 600	P G ..	X	0.40	Italy
Campbell	..	—	Navy	—	P G ..	—	—	Great Britain
Campetro ¹⁵	..	150	Companhia Lloyd Nacional, Rio de Janeiro	300, 600	P G ..	N	0.40	Brazil
Campidoglio ¹⁷	..	140	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	300, 600	P G ..	X	0.40	Italy
Campinas FCS ¹	..	200	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	— ²⁷	0.40	France
Campinas PVD ¹⁶	..	90	Companhia Lloyd Nacional, Rio de Janeiro	300, 600	P G ..	N	0.40	Brazil
Campos ²	..	200	Lloyd Brasileiro, Rio de Janeiro	600	P G ..	N	0.40	Brazil
Camproa ¹	..	100	Figueroa y Campos, Madrid and Valencia	300, 600	P G ..	N	0.40	Spain
Canada FJC ¹	..	250	Compagnie Française de Navigation à Vapeur, Cyprien Fabre & Cie, Marseilles	300, 600	P G ..	N	0.30	France
Canada Maru ¹	..	350	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G ..	N	0.40	Japan
Canada MCF ¹⁹	..	260 ¹	—	300, 600	P G ..	N	0.40	Great Britain

Canada SDQ ¹	SDQ	250	Rederiaktiebolaget, Norðstjarnan (Johnson Line), Stockholm (Sweden-South America Line)	300, 600	P	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 1900	0.40	4.00	Sweden
Canard	FAUC	—	Navy	300, 800	P G	N	0.05	—	France
Canadian Adventurer ²¹	XWD	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Aviator ²¹	XWG	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Beaver ²¹	XWY	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Britisher ²¹	VGLT	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 600, 800	P	— 27	—	—	Canada
Canadian Carrier ²¹	VGKM	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Challenger ²¹	VGLY	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Coaster ²¹	VGJW	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Commander ²¹	VGJL	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Conqueror ²¹	VGLX	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Constructor ²¹	VGLZ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Cruiser ²¹	VGNB	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Engineer ²¹	VGLQ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian English ²¹	VGLT	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P G	— 27	0.40	—	Canada
Canadian Explorer ²¹	VGBQ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Farmer ²¹	XWX	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Fisher ²¹	VGBM	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P G	N	0.40	—	Canada
Canadian Forester ²¹	VGBT	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P G	N	0.40	—	Canada
Canadian Freighter ²¹	VGDF	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Gunner ²¹	XWE	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Harvester ²¹	VGBZ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Highlander ²¹	VGDC	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Hunter ²¹	VBEX	300	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Importer ²¹	XWQ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 600, 800	P	— 27	0.40	—	Canada
Canadian Inventor ²¹	XWT	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 600, 800	P	— 27	0.40	—	Canada
Canadian Leader ²¹	VGJX	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 600, 800, 800	P	— 27	0.40	—	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Canadian Logger ²¹	VGLS	250	Canadian Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Mariner ²¹	VGBF	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P G	— 27	0.40	—	Canada
Canadian Miller ²¹	XVZ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Miner ²¹	XWV	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Navigator ²¹	XWJ	300	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Observer ²¹	VGLB	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Otter ²¹	VGLF	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Pathfinder ²¹	VGLN	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Pioneer ²¹	CKT	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Planter ²¹	XWP	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Prospector ²¹	XWU	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Raider ²¹	XWN	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Rancher ²¹	XWO	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Ranger ²¹	XVF	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Reaper ²¹	VGDK	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 800	P	— 27	0.40	—	Canada
Canadian Recruit	XVK	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300 800 800	P	— 27	0.40	—	Canada
Canadian Rover ²¹	VGDZ	250	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Runner ²¹	VGDT	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Sailor ²¹	XVR	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada
Canadian Sapper ²¹	VGBK	200	Canadian Government Merchant Marine, Montreal (P.Q.)	300, 450, 800, 800	P	— 27	0.40	—	Canada

Canadian Scottish ²¹	VGDK	250	Canadian Marine, Government Merchant	300, 600	P	..	— 27	0.40	Canada
Canadian Sealer ²¹	XWK	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Seigneur ²¹	XYS	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Settler ²¹	XWI	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Signaller ²¹	XVU	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Skirmisher ²¹	VGBW	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Sower ²¹	XWH	150	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Spinner ²¹	XWM	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Squatter ²¹	VGJT	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Trader ²¹	XVP	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Transport ¹⁰	ZDU	130	Canadian Marine, Government Merchant	300, 600	P G	..	X	0.40	Great Britain
Canadian Transporter ²¹	VGBY	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Trapper ²¹	VGNC	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Traveller ²¹	VGBC	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Trooper ²¹	XVN	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Victor ²¹	VGBP	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Volunteer ²¹	XVM	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Voyageur ²¹	CKS	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Warrior ²¹	XVA	200	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadian Winner ²¹	VGDB	250	Canadian Marine, Government Merchant	300, 450, 600, 800	P	..	— 27	0.40	Canada
Canadienne (La) ²	XWS	150	Canadian Marine, Government Merchant	300, 600	P	..	— 27	0.40	Canada
Canadier ¹⁹	BCP	160	Canadian Marine, Government Merchant	300, 600	P G	..	X	0.40	Great Britain
Canalejas ¹	EK	100	Atlantic Salvage Co.	300, 600	P G	..	X	0.30	Spain
Canandaigua ⁹⁹	NCR	—	Compagnia Trasmediterranea, Barcelona	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Cananova ¹⁰³	KDBN	200	Navy	300, 600	P G	..	X	0.40	United States of America
Canara ¹⁹	GAF	170	Cananova Steamship Corporation, 61, Broadway, New York (N.Y.)	300, 600	P G	..	X	0.40	Great Britain
Canaro ¹⁷	IPT	140	Adria, Società Anonima di Navigazione Marittima, Fiume	300, 600	P G	..	X	0.40	Italy
Cauberra ¹	VHO	240	—	300, 600	P G	..	..	0.20 ⁸	Australian Commonwealth

0930 to 1030
1200 to 1300
1400 to 1430
1630 to 1730
2030 to 0030
(ship's time)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Canco ²	KUTP	100	American Can Company	300, 600	P	X	—	—	United States of America
Candidate ¹²	EYK	—	—	300, 600	P G	X	0.40	—	Great Britain
Canibás ¹¹ 111 111	WQEU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Cannayieras ¹⁵	PUO	150	Companhia de Navegação Bahiana, São Salvador (Bahia)	300, 600	P G	N	0.40	—	Brazil
Cano ¹⁹	GDFC	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Great Britain
Canoga ⁸⁷	WKZ	300	—	300, 600	P G	X	0.40	—	United States of America
Canonesa ¹⁸	GCKM	—	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	4.00	Great Britain
Canonnier ¹⁰	OTK	150-200	—	300, 600	P G	X	0.40	—	Belgium
Canopic ¹⁹	MPC	170	—	300, 600	P G	N	0.40	—	Great Britain
Canopo	IAAM	—	Navy	—	—	—	—	—	Italy
Canopus ¹⁶²	NIRX	—	Adria, Società Anonima di Navigazione Marittima, Fiume	300, 600	P G	N	0.40	—	United States of America
Canova ¹⁷	UVV	190	—	300, 600	P G	X	—	—	Italy
Cansumset ¹⁷	KIOD	—	U.S. Shipping Board	300, 600	P G	X	0.20	—	United States of America
Cantal ¹	FGC	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Cantara ¹	VZC	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Canterbury	GEDY	—	Navy	—	P G	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	—	—	Great Britain
Cauton ¹	SGB	250	Aktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg	300, 600	P	—	0.40	4.00	Sweden
Capac ¹⁸	GXI	180	—	300, 600	P G	—	0.40	—	Great Britain
Cap Arcona ¹	UDE	300	Transports Maritimes de l'Etat	300, 600	P G	2 ²⁷	0.40	—	France
Cape Cross ¹⁹	GBWV	—	British Africa Shipping & Coaling Company, Ltd.	300, 450, 600	P G	X	0.40	—	Great Britain
Cape Cross ¹⁹	VNE	150	Canada Steamship Lines, Montreal (P.Q.)	300, 450, 600, 800	P G	X	0.40	—	South Africa (Union of)
Cape Eternity ²¹	VGLW	125	—	300, 600, 800	P G	— ²⁷	0.40	—	Canada
Cape Henry ⁹⁷	KMIE	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America

Ship	WDOI	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 800	P.G.	N	United States of America
Cape May ¹⁸³	..	300	—	300, 600, 800	P.G.	X	United States of America
Cape Ortegal ¹⁹	..	—	—	300, 600	P.G.	X	Great Britain
Cape Point ¹⁹	..	—	—	300, 450, 600, 800	P.G.	X	Great Britain
Cape Point ¹⁹	..	150	British Africa Shipping & Coaling Company, Ltd.	300, 450, 600, 800	P.G.	X	South Africa (Union of)
Cape Recife ²⁰	..	100	British Africa Shipping & Coaling Company, Ltd.	300, 600	P.G.	X	Great Britain
Cape Recife ²⁰	..	Day	—	300, 450, 600, 800	P.G.	X	South Africa (Union of)
Cape Recife ²⁰	..	Night	—	—	—	—	—
Cape Romain ¹⁰³	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	United States of America
Capetown Maru ¹	..	400	Kawasaki Kisen Kaisha ..	300, 600	P.G.	—	Japan
Cape Transport ¹⁹	..	140	Canada Steamship Lines, Ltd., Montreal (P.Q.)	300, 600	P.G.	0800 to 1100	Great Britain
Cape Trinity ²¹	..	100	Société les Pêcheries de Fécamp, Fécamp	300, 600	P.G.	1400 to 1700	Canada
Cap Fagnet ¹	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	2000 X ²⁷	France
Capillo ² ¹³¹	..	300	Hijos de J. Taya, Barcelona ..	300, 450, 600	P.G.	X	United States of America
Capita Revuelta	150	Compagnie Générale Transatlantique, Paris	300, 600	P.G.	N	Spain
Capitaine Coulon ¹	..	200	Compagnie de Navigation Mixte, 54, Rue Cannibière, Marseilles	300, 600	P.G.	X	France
Capitaine Damiani ¹	..	250	Compagnie des Messageries Maritimes, Paris	300, 600	P.G.	X	France
Capitaine Faure ¹	..	600	Transports Maritimes de l'Etat	300, 600	P.G.	X	France
Capitaine Maurice Eugene ¹	..	180	Navy	300, 800	P.G.	X	France
Capitaine Mehl	—	Compagnie Générale Transatlantique, 6, Rue Aubert, Paris	300, 450, 600, 800	P.G.	N	France
Capitaine Winckler ²	..	250	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	France
Capital of Nebraska ² ¹³¹	..	—	Southern Pacific Company, Pier 49, North River, New York (N.Y.)	300, 450, 600	P.G.	X	United States of America
Capitan (El) KKH ²	..	200	Standard Oil Company of New Jersey, Incorporated, 26, Broadway, New York (N.Y.)	300, 450, 600	P.G.	X	United States of America
Capitan (El) WNB ² ¹³¹	..	300	Compagnia Transmediterranea, Barcelona	300, 450, 600	P.G.	X	United States of America
Capitan Segarra ¹	..	250	Navy	300, 600	P.G.	N	Spain
Capitano Verri	—	Pereira Carneiro & Company, Ltd., Rio de Janeiro	—	—	—	Italy
Capivary ²	..	200	Société Anonyme de Gérance et d'Armement, Paris	300, 500, 600	P.G.	N	Brazil
Cap Lopez ¹	..	200	Marittima Italiana Società di Navigazione per Servizi Postali	300, 600	P.G.	X	France
Capodimonte ¹⁷	..	190	Genoa	300, 600	P.G.	X	Italy

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Cap Ortega ¹	UDF	300	Transports Maritimes de l'Etat	300 600	P G	— ²⁷	0.40	—	France
Cap Polonio ⁵⁵	DCP	550	—	300 450 600	P G	N	0.40	4.00	Germany
Capella ¹⁹	OPH	160	—	300 600	P G	X	0.40	—	Great Britain.
Caprice ¹⁷	IWI	190	Navigation Generale Italiana, Genoa	300 600	P G	X	0.40	—	Italy
Capricieux	FBCZ	—	Navy	300 800	P G	N	0.05	—	France
Capricorne ¹	FDE	200	Société Nouvelle des Pêcheries de France, 16 Rue des Pyramides, Paris	300 600	P G	X	0.40	—	France
Capri GFRJ ¹⁹	GFRJ	—	—	300 450 600	P G	X	0.40	—	Great Britain
Capri ING ¹⁷	ING	140	Maritima Italiana Società di Navigazione per Servizi Postali, Genoa	300 600	P G	X	0.40	—	Italy
Capsa ¹⁹	LUE	150	—	300 600	P G	X	0.40	—	Great Britain
Captain A. F. Lucas ^{9 131}	WTV	150	Standard Oil Company of California, Incorporated, Sheldon Building, San Francisco (Cal.)	300 450 600	P G	X	0.40	—	United States of America
Captain A. M. Wetherill ²	WYAT	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	400	O	X	—	—	United States of America
Captain Charles W.	WYAI	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	400	O	X	—	—	United States of America
Captain Clarence M.	WYBY	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	300, 600	P G	N	—	—	United States of America
Captain Condon ¹⁰²	P.	—	—	300, 600	P G	N	—	—	United States of America
Captain Edward P.	WYBP	—	—	300, 600	P G	N	—	—	United States of America
Captain Nones ¹⁰²	WYBO	—	—	300, 600	P G	N	—	—	United States of America
Captain Edwin C. Long ¹⁰²	WYBN	—	—	300, 600	P G	N	—	—	United States of America
Captain Fred L. Perry ¹⁰²	WYBP	—	—	300, 600	O	X	—	—	United States of America
Captain Gregory Barrett ²	WYAP	—	—	400	O	X	—	—	United States of America
Captain James Farnance ²	WYAM	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	400	O	X	—	—	United States of America
Captain Samuel C. Cardwell ¹⁰²	WYBM	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	300, 600	P G	N	—	—	United States of America
Captain T. M. Morrison ²	WYAZ	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	1,200	O	X	—	—	United States of America
Capto ²³	LGL	100-150	(Amateur) B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	—	Norway
Canlin ^{9 131}	KUZR	—	U.S. Shipping Board, Washington	300 600	P G	X	0.40	—	United States of America

Shipboard Stations

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Caracas ⁹ 121	KDB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	4.00	United States of America
Caradoc	GEDZ	—	Navy	—	P G	—	—	—	Great Britain
Caralbe ¹ ..	FQC	300	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Caracuet ¹⁹	MOD	170	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	N	0.40	—	Great Britain
Caravellas ¹	FOK	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Caravelle ¹	FTC	250	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Carbet ¹ ..	FTY	350	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Carbo II ³⁵	DCO	200	—	300, 600	P G	0900 to 1200 1500 to 1800 2200 to 2400 and as may be required	0.40	4.00	Germany
Cardiff EXW ¹⁹	EXW	135	Navy	300, 600	P G	X	0.40	—	Great Britain
Cardiff GEFB	GEFB	—	—	—	P G	—	—	—	Great Britain
Cardiff Hall ¹⁹	ZUZ	135	—	300, 600	P G	X	0.40	—	Great Britain
Cardigan ¹⁹	BCQ	170	—	300, 600	P G	X	0.40	—	Great Britain
Cardigaushire ¹⁹	MAU	200	—	300, 600	P G	N	0.40	—	Great Britain
Cardinal ⁹⁹	NAFN	—	—	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Cardiffa ¹⁹ ..	XMN	—	—	300, 600	P G	X	0.40	—	Great Britain
Cardium ¹⁹	MZB	200	—	300, 600	P G	X	0.40	—	Great Britain
Cardonia ..	KUVV	300	—	300, 450, 600	P G	X	0.40	—	United States of America
Carducci ¹⁷	UUP	140	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Italy
Carenco ⁹ 131	KDDM	300	Adria, Società Anonima di Navigazione Marittimi, Fiume (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Carib KJIU ²	KJIU	—	Atlantic Gulf & W. Indies S.S. Lines, 11, Broadway, New York	300, 600	P G	X	0.20	—	United States of America
Carib KUZX ²	KUZX	150	George F. Silva, care of William T. Higgins, 100, Varick St., N.Y.	300, 425, 600	P G	X	0.20	—	United States of America
Caribbean ¹¹⁴	KGUE	300	Panama Canal	300, 600	P	X	—	—	United States of America
Caribniere	IJJ	—	Navy	300, 600	P G	X	0.40	—	Italy
Cariddi ¹⁷ ..	IMC	140	Sicilia Società de Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Carignano ¹⁷	IOR	190	Lloyd Sabauda Società Anonima per Azioni, Genoa	300, 600	P G	X	0.40	—	United States of America
Carillo ⁹⁸	KDE	500	United Fruit S.S. Corporation	300, 600	P G	N	0.40	—	Australian Commonwealth
Carina ¹ ..	VZM	240	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	—
Carinthia ¹⁷	ICCQ	140	Lloyd Triestino Società di Navigazione a Vapore Trieste	300, 600	P G	X	0.40	—	Italy
Carisbrook ¹⁹	EKF	—	—	300, 600	P G	X	0.40	—	Great Britain
Carisbrook Castle ¹⁹	MOW	200	—	300, 600	P G	N	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Carissan ¹⁷	..	—	Navy	600, 800	P G	N	0.05	—	France
Carla ¹⁷	..	190	Compagnia Italiana Navigazione e Commercio d'Oltremare (C.I.N.C.O.) Rome	300, 600	P G	X	0.40	—	Italy
Carl D. Bradley ^{9 111}	..	100	Bradley Transportation Co.	300, 450, 475, 600	P G	X	0.10	—	United States of America
Carlier ¹⁴	..	300	Lloyd Royal Belge, Antwerp	300, 450, 600, 800	P G	X	0.40	4.00	Belgium
Carlisle	..	—	Navy	300, 600, 900	P G	—	—	—	Great Britain
Carl-Marks	..	300	—	—	O	0200 to 0600 (time of Moscow)	0.40	—	Russia
Carlo ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Carlo Victoria ¹⁷	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Carlo Pisacane	..	190	Esercizio Navigazione di Stato, Rome	300, 600	P G	X	0.40	—	Italy
Carlos Gomes	..	80	Navy	300	O ¹⁸	—	0.40	—	Brazil
Carlos V.	..	500	Navy	300	O	—	—	—	Spain
Carlown Castle ¹⁹	..	165	—	300, 600	P G	X	0.40	—	Great Britain
Carlisle ¹⁴	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Carlskold ¹	..	350	Svenska America-Mexico, Linjen	300, 600	P G	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Carlton ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Carl Vihnen ³⁵	..	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Carmania ⁷¹	..	350	Operated by the Cunard S.S. Co., Ltd., Cunard Building, Liverpool	300, 450, 600	P G	N	0.40	—	Great Britain
Carmarthenshire ¹⁹	..	220	—	300, 600	P G	N	0.40	—	Great Britain
Carmen ARX ¹	..	200	(Armateur) T. Lodding, Christiania	300, 600	P G	X	0.40	4.00	Norway
Carmen FAC ⁴³	..	—	Compagnie France-Atlantique, Paris	—	P G	X	0.40	—	France
Carmen SIP ¹	..	200	Rederiaktiebolaget Carmen, Stockholm	300, 600	P	X	0.40	4.00	Sweden
Carnarvonshire ¹⁹	..	220	—	300, 600	P G	N	0.40	—	Great Britain
Camola ⁴⁷	..	140	Lloyd Triestino Società di Navigazione	300, 600	P G	X	0.40	—	Italy

Ship	Class	Year	Builder	Location	Armament	Speed	Range	Notes
Carol I ^{er}	FYH	1899	Boulevard, Paris	France	300, 600	10	0.40	United States of America
Carola IV ⁹⁹	NNO	1899	L. Dreyfus & Cie., Paris	France	300, 600	10	0.40	United States of America
Carolina E. de Perez ¹	ECF	1899	Angel F. Perez, Santander	Spain	300, 600	10	0.40	United States of America
Carolina WFE ^{9 121}	WFE	1899	Goodrich Transit Co., Foot of Michigan Ave., Chicago (Cal.)	Spain	300, 600	10	0.40	United States of America
Carolina UQD ¹⁷	UQD	1899	Cosulich, Società Iriestina di Navigazione, Trieste	Italy	300, 600	10	0.40	United States of America
Caroline ¹	FTO	1899	Compagnie Générale Transatlantique, Paris	France	300, 600	10	0.40	United States of America
Caroline Hensoth ³⁵	DCH	1899	Kokusai Kisen Kaisha	Germany	300, 450, 600	10	0.40	United States of America
Caroline Maru ¹	JNR	1899	Kokusai Kisen Kaisha	Japan	300, 600	10	0.40	United States of America
Carolina SJG ¹	SJG	1899	Africanska Angfartygs Aktiebolaget, Gothenburg	Sweden	300, 600	10	0.40	United States of America
Carolinian ^{9 121}	KJF	1899	Garland S.S. Corp., 16, California St., San Francisco (Cal.)	United States of America	300, 450, 600	10	0.40	United States of America
Carolus ¹⁹	GDBL	1899	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	Great Britain	300, 600	10	0.40	United States of America
Carolyn ¹⁰³	KZG	1899	—	Great Britain	300, 600	10	0.40	United States of America
Caronia ³⁰	MRA	1899	—	Great Britain	300, 450, 600	10	0.40	United States of America
Carpati ²	CVP	1899	Marine Department of the Roumanian Government	Roumania	300, 600	10	0.40	United States of America
Carpentaria ¹⁰	MHG	1899	—	Great Britain	300, 600	10	0.40	United States of America
Carperby ¹⁹	BTS	1899	—	Great Britain	300, 600	10	0.40	United States of America
Carpio ¹⁹	GFQZ	1899	—	Great Britain	300, 450, 600	10	0.40	United States of America
Carplaka ¹	KDES	1899	U.S. Shipping Board, Washington (D.C.)	United States of America	300, 450, 600	10	0.40	United States of America
Carquois	FBHC	1899	Navy	France	300, 800	10	0.05	United States of America
Car ¹⁰²	NEXP	1899	Navy	United States of America	300, 600	10	0.20 111	United States of America
Carbasset ⁹⁹	NEVQ	1899	Navy	United States of America	300, 600	10	0.40 112	United States of America
Carabelle ⁹⁷	KDER	1899	U.S. Shipping Board, Washington (D.C.)	United States of America	300, 600	10	0.40	United States of America
Carrigan Head ¹⁹	ZKT	1899	—	Great Britain	300, 600	10	0.40	United States of America
Carronpark ¹⁹	GFTD	1899	Navy	Great Britain	300, 450, 600	10	0.40	United States of America
Carstairs ¹	GEYW	1899	—	Great Britain	300, 600	10	0.40	United States of America
Cartagena ³⁵	DXN	1899	—	Germany	300, 600	10	0.40	United States of America
Cartago ⁹⁸	KDD	1899	United Fruit S.S. Corporation	United States of America	300, 600	10	0.40	United States of America
Cartier ²	CFB	1899	Department of Marine & Fisheries	Canada	300, 600	10	0.40	United States of America
Carventum ¹⁷	UQW	1899	Esercizio Navigazione di Stato, Rome	Italy	300, 600	10	0.40	United States of America
Caryfort	GEFJ	1899	Navy	Great Britain	300, 600	10	0.40	United States of America
Casamance ¹	FKS	1899	Compagnie des Chargeurs Réunis, Paris	France	300, 600	10	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Cascade ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Casco ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Casa ¹⁰²	..	—	—	300, 600	P G ..	N	—	—	United States of America
Caserta ¹⁷	..	190	—	300, 600	P G ..	N	0.40	—	Italy
Casey ¹⁰⁸	..	300	Navigazione Generale Italiana, Genoa	300, 450, 600	P G ..	X	0.40	—	United States of America
Casiana ^{9 131}	..	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
C. A. Smith ²	..	—	Yacht belonging to Edward L. Doheny, 8, Chester Place, Los Angeles (Cal.)	300, 600	P G ..	X	—	—	United States of America
C. A. Snider ^{9 131}	..	300	Pacific States Lumber Co. ..	300, 600	P G ..	X	0.20	—	United States of America
Casper ^{9 131}	..	300	Union Sulphur Co., 8, Beaver St., New York	300, 450, 600	P G ..	X	0.40	—	United States of America
Casque	..	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.05	—	France
Cassandra ¹⁹	..	200	Navy ..	300, 800, 2,100 c.w.	P G ..	N	0.40	—	Great Britain
Cassard	..	—	Navy ..	300, 800	P G ..	N	0.05	—	France
Cassei ³⁵	..	400	—	300, 450, 600	P G ..	X	0.40	—	Germany
Cassio ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Cassiopea	..	—	Navy ..	—	—	—	—	—	Italy
Cassiopeo	..	—	Navy ..	300, 800	P G ..	N	0.05	—	France
Cassimir	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Cassin ⁸⁹	..	—	Navy ..	300, 800	P G ..	N	0.20 ¹¹¹	—	United States of America
Cassio	..	160	—	300, 600	P G ..	X	0.40 ¹¹²	—	Great Britain
Castalia MWZ ¹⁹	..	180	—	300, 600	P G ..	X	0.40	—	Great Britain
Castana ⁸⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Castellar ¹⁹	..	120	Navy ..	300, 600	P G ..	X	0.40	—	Great Britain
Castelfidardo	..	140	Lloyd Sabaudo Società Anonima Perazioni, Genoa	300, 600	P G ..	X	—	—	Italy
Castelporziano ¹⁷	..	—	—	300, 600	P G ..	X	0.40	—	Italy
Castilian ¹⁹	..	—	Compania Transmediterranea, Barcelona	300, 600	P G ..	X	0.40	—	Great Britain
Castilla ¹	..	150	—	300, 600	P G ..	N	0.30	3.00	Spain

Shipboard Stations

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Castle Lodge ⁹⁷	KGW	300	Henry Hencken	300, 450, 600	P G	..	X	0.40	United States of America
Castlemoor	GJKW	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	Great Britain
Castle Point ¹⁰³	KESD	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Castle Town ^{9 131}	KOF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	United States of America
Castlewood ¹⁰³	KEKQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Castor	GEFK	—	Navy	—	P G	..	—	—	Great Britain
Castro Allen ²	TIP	150	Compania Iberica de Telecommunication	300, 600	P G	..	—	0.30	Spain
Catahoula ⁹⁷	KDFG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Catalina ¹	ECT	300	Phillos Izquierdo y Cia, Cadiz	300, 600	P G	..	N	0.30	Spain
Catalina ZHL ¹⁹	ZHL	210	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P G	..	X	0.40	Great Britain
Catalonia ¹	SID	250		300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	Sweden
Cataluna EBF	BBF	216	Navy	—	O	..	—	—	Spain
Cataluna EDC ¹	EDC	108	Compania Transatlantica, Barcelona	300, 600	P G	..	N	0.30	Spain
Cataluna EFC ²	EFC	100	Compania Islena Maritima, Barcelona	300, 600	P G	..	N	0.30	Spain
Catamarca ¹	LIA	—	Navy	450, 600	O	..	N	—	Argentine Republic
Catania IMJ ¹⁷	IMJ	190	Esercizio Navigazione di Stato, Rome	300, 600	P G	..	N	0.40	Italy
Caterham	GEYX	—	Navy	—	P G	..	—	—	Great Britain
Caterina Gerolimich ¹⁷	UUV	140	Navigazione Generale Gerolimich & Comp., Societa in Azioni, Trieste	300, 600	P G	..	X	0.40	Italy
Cathay ^{9 131}	KDWX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	N	0.40	United States of America
Catherine ¹⁰³	KTOJ	150	Bull Insular S.S. Company	300, 450, 600	P G	..	X	0.40	United States of America
Catherine D ⁹⁷	KMAI	500	Pacific American Fisheries, South Bellingham (Wash.)	300, 450, 600	P G	..	X	0.40	United States of America
Catharine Apar ¹⁵	VUF	160	British India Steam Navigation Co., Ltd.	300, 600	P G	..	X	0.40	India
Catharine Schiaffino ¹	UIK	200	Societe Algerienne de Navigation par l'Afrique du Nord (Ch. Schiaffino & Cie, 83, Rue St. Lazare, Paris)	300, 450, 600	P G	..	X	0.40	France
Cathlamet ⁹⁷	KOLP	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Cathwood ¹⁰³	KURC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	—	0.40	United States of America
Catnat ¹	UCT	350	Compagnie Havraise Peninsulaire de Navigation a Vapeur	300, 450, 600	P G	..	X	0.40	France
Cauca ¹⁹	GVZ	140	—	300, 600	P G	..	X	0.40	Great Britain
Caucase ¹	FIC	400	Compagnie des Messageries Maritimes, Paris	300, 600	P G	..	— ²⁷	0.40	France
Caucasier ¹⁴	OSDA	200	Lloyd Royal Belge, Antwerp	300, 600	P G	..	X	0.40	Belgium
Caupolican ¹	CDJ	250	Borquez & Cia. Calle Blanco, 1061, Valparaiso	300, 600	P G	..	X	0.40	Chile

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Wavelength in Heavy Type).	Nature of Service formed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Cauto ¹⁰³	KWF	300	New York and Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 450, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Cavalier	FBCV	—	Navy	300, 800	P G ..	N	0.05	—	France
Cavalla ¹	SIK	250	Rederiaktiebolaget Sverige Levanten, Gothenburg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Cavallaire ¹	FKF	200	Société Maritime Nationale, 5, Rue Boudreau, Paris	300, 600	P G ..	X	0.40	—	France
Cavallo ¹⁰	GDNS	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Cavour ¹⁰	YOR	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Cawdor Castle ¹⁰	GCRF	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Caxambú	SSW	100	Lage & Irmãos, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Caxambú HPU ¹	HPU	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Caxias ²	SST	400	Lloyd Brasileiro, Rio de Janeiro	600	P G ..	X	0.40	4.00	Brazil
Cayo Mambi ¹⁰³	KUZZ	200	Cayo Mambi S.S. Corporation, 61, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Cayuga KDJQ	KDJQ	—	Independant S.S. Co., Foot of Orleans St., Detroit (Mass.)	300, 600	P G ..	X	—	—	United States of America
Cayuga NAFP ⁹⁹	NAFP	—	Navy	300, 600	P G ..	N	0.20	—	United States of America
Cayuga VEL ²¹	VEL	100	Canada S.S. Lines, Ltd., Montreal, (P.Q.)	300, 600	P G ..	— ²⁷	0.40	—	Canada
Caza Submarino Numero 1	PWS	—	Navy	—	—	—	—	—	Cuba
Caza Submarino Numero 2	PWT	—	Navy	—	—	—	—	—	Cuba
Caza Submarino Numero 3	PWU	—	Navy	—	—	—	—	—	Cuba
Caza Submarino Numero 4	PWV	—	Navy	—	—	—	—	—	Cuba
Ceará SNC	SNC	—	Lloyd Brasileiro, Rio de Janeiro	300, 800	O ³	—	0.40	4.00	Brazil
Ceará SKD ¹⁵	SRD	250	Compania Maritima	300, 600	P G ..	N	0.40	—	Brazil
Cebu	KDOC	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Cedil County ^{9 131}	KERZ	300	—	—	—	X	—	—	United States of America
Cecilie ¹	UKI	200	Société Dieppoise d'Armement à la Pêche	300, 600	P G ..	X	0.40	—	France
Cecilia Sanné ¹	SJX	250	Aktiebolaget J. N. Sanné, Uddevalla	300, 600	P	0700 to 0800 1100 to 1200	0.40	4.00	Sweden

Cedar Branch ¹⁹ Cedarhurst	..	YMP KDIQ	170 —	Commerce, Washington (D.C.) U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	.. ..	X X	0.40 0.40	— —	United States of America Great Britain United States of America
Cedar Spring ^{9 131}	..	WTEE	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Cedric ¹	..	TSI	150	(Armateurs) A/S det Selmerske Rederi, Trondhjem	300, 450, 600	P G	..	X	0.40	4.00	Norway
Cèdre	..	FAHC	—	..	300, 800	P G	..	N	0.05	—	France
Cedric ¹⁹	..	MDC	350	..	300, 600, 2,100, 2,200	P G	..	N	0.40	—	Great Britain
Ceduna ¹	..	VKW	300	..	C.W. 300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Ceferino Ballesteros ¹	..	ECS	150	Sociedad Anonima Fabrica Mieres, Mieres	300, 600	P G	..	X	0.30	3.00	Spain
Celano ¹	..	PIY	150	Maatschappij Zeevaart, Rotterdam	300, 450, 600, 800	P G	..	X	0.40	4.00	Holland
Celandine	..	GEYZ	—	Navy	—	P G	..	—	—	—	Great Britain
Célebes ¹	..	PGO	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600 800	P G	..	X	0.40	4.00	Holland
Celebes Maru ¹	..	JCE	500	Kawasaki Kisen Kaisha	300, 600, 1,800	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Celestial ¹⁰³	..	KDUV	—	U.S. Shipping Board, Washington (D.C.)	—	P G	..	X	0.40	—	United States of America
Célio ²	..	WMF	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Célimène ¹	..	FZI	300	Compagnie Africaine d'Armement, 5, Avenue du Coq, Paris	300, 600	P G	..	X	0.40	—	France
Celio ¹⁷	..	UQQ	140	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	300, 600	P G	..	X	0.40	—	Italy
Cedmon ⁹⁸	..	NEZT	—	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Celtic MLC ¹⁹	..	MLC	250	..	300, 600, 2,100, 2,200	P G	..	N	0.40	—	Great Britain
Celtic NDB ⁹⁹	..	NDB	—	Navy	C.W. 300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Celtic Prince ¹⁹ Celtistear ¹⁹	..	XIX ZXQ	120 120	..	300, 600 300, 600	P G P G	..	X X	0.40 0.40	—	Great Britain Great Britain
Centaure	..	GEFL	—	Navy	—	P G	..	—	—	—	Great Britain
Centaure FACE Centaure UIE ¹	..	FACE UIE	— 85	Navy Société Nationale de Sauvetage et de Remorquage France, 13, Rue Scribe, Paris	300, 800 300, 600	P G P G	..	N X	0.05 0.40	—	France France
Centauro Centauros ^{9 131}	..	IAAO KOPZ	— 300	Navy Green Star Steamship Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G	..	X	— 0.20	—	Italy United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Cento ¹⁹	..	145	—	300, 600	P G	X	0.40	—	Great Britain
Centurion EYL ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Centurion GEBL	..	—	..	300, 450, 600	P G	X	0.40	—	Great Britain
Centurion KDVZ ²	..	300	..	300, 450, 600	P G	0930 to 1030	0.20 ⁸	—	United States of America
Century ¹	..	300	—	300, 600	P G	1200 to 1300	0.40 ⁶	—	Australian Commonwealth
Cephalonia TGS ¹	..	100-150	Yannoulatos Bros., Piræus	300, 600	P G	1400 to 1430	0.40	4.00	Greece
Céphée ¹	..	150-200	G. E. Ambatielos, London	300, 600	P G	1630 to 1730	0.40	4.00	Greece
Cepolis ¹⁹	..	400	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	2030 to 0030 (ship's time)	0.40	—	France
Ceram ¹	..	150	—	300, 600	P G	X	0.40	—	Great Britain
Ceram ¹⁰	..	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	0.40	Holland
Ceramic ¹⁰	..	250	—	300, 450, 600, 2,100, 2,200, 2,400	P G	X	0.40	—	Great Britain
Cerbère	..	—	Navy	300, 800	P G	N	0.05	—	France
Cerberus	..	—	Navy	600	O	—	—	—	Australian Commonwealth
Cerea ¹⁷	..	140	Navigazione alta Italia, Turin	300, 600	P G	—	0.40	—	Italy
Ceres GEEM	..	—	Navy	—	P G	—	—	—	Great Britain
Ceres PYW ¹	..	150	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G	—	0.40	4.00	Holland
Cerisco ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Cerrito ²	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cerro-Azul ^{9 121}	..	300	Pan-American Petroleum and Transport Co., Incorp., 1015, Security Building, Los Angeles, (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
Cerro-Ebano	..	300	Pan-American Petroleum and Transport Co., Incorp., 1015, Security Building, Los Angeles, (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America

Consolidated Publishing Co., Inc., New York

Certo ²⁸	AQH	(D.C.) (Amateur) B. Stolt- Nielsen, Haugesund	300, 600	P G	..	0.40	4.00	United States of America
Cervantes ¹⁹	150	—	300, 600	P G	..	0.40	4.00	Norway
Cesar ¹⁰	140	—	300, 600	P G	..	0.40	—	Great Britain
Cethana ²	300	Ocean Motorship Co.	300, 600	P G	..	0.40	—	Great Britain
Centa ¹⁹	300	—	300, 450, 600	P G	..	0.40	—	United States of America
Ceylan ¹	300	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	..	0.40	—	Great Britain
Ceylon PHE ¹	150	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 600, 800	P G	..	0.40	4.00	Holland
Ceylon SGY ¹	350	Sweden-East Asia, Aktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg Line	300, 600	P	..	0.40	4.00	Sweden
Ceylon Maru ¹	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	..	0.40	—	Japan
C. F. Grove	100	Government	300, 600	P G	..	— ³⁸	— ³⁸	Denmark
C. F. Liljevalch ¹	250	Trafikaktiebolaget Grängesberg - Oxelösund, Stockholm	300, 600	P	..	0.40	4.00	Sweden
C. G. Thulin ¹	150	Rederiaktiebolaget Roslagen, Stock- holm	300, 600	P	..	0.40	4.00	Sweden
Ch. 14	—	Navy	—	—	..	—	—	Canada
Ch. 15	—	Navy	—	—	..	—	—	Canada
Chacabuco	—	—	450, 600	O	..	—	—	Chile
Chaco ¹	180	—	300, 600	P G	..	0.40	—	Argentine Republic
Chakdara ¹⁹	180	—	300, 600	P G	..	0.40	—	Great Britain
Chakdina ¹⁹	180	—	300, 600	P G	..	0.40	—	Great Britain
Chakra ¹⁹	170	—	300, 600	P G	..	0.40	—	Great Britain
Chalister ¹⁹	220	—	300, 600	P G	..	0.40	—	Great Britain
Chalkis ¹	170	—	300, 600	P G	..	0.40	—	Great Britain
Challamba ²	100-150	Panenoic Steamship Co., Piræus	300, 600	P G	..	0.40	—	Greece
Challenger ¹⁰⁸	300	Ocean Motorship Co.	—	P G	..	0.40	4.00	Great Britain
Chalmette ²	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.20	—	United States of America
Chama ¹⁹	190	Southern Pacific S.S. Co., Pier 49, North River, New York (N.Y.)	300, 600	P G	..	0.40 ¹¹¹	—	United States of America
Chamberino ⁹⁷	200	—	300, 600	P G	..	0.40	—	Great Britain
Chamblee ⁹⁷	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	—	United States of America
		U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per World.	Minimum per Radio-telegram.	
Champlin ⁹⁹	NEKQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Chambord ¹	UDF	300	Transports Maritimes de l'Etat	300, 600	P G	0800 to 0600 1600 to 1800 2000 to 2200	—	—	France
Chamois	FACH	—	Navy	300, 800	P G	N	0.05	—	France
Champagne (La) ¹	UHF	200	Victor Le Claire, Boulogne-sur-Mer	300, 600	P G	X	0.49	—	France
Champion	GFEN	—	Navy	—	P G	—	—	—	Great Britain
Champlain	FBCH	—	Navy	300, 800	P G	—	0.05	—	France
Chancellor ¹⁹	ZLA	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Chanchardon II ¹	FDD	180	Compagnie des Pêcheries de l'Atlantique (Oscar Dahl), La Rochelle	300, 600	P G	X	0.40	—	France
Chanda ¹⁹	GPT	180	Navy	300, 600	P G	X	0.40	—	Great Britain
Chandler ⁹⁹	NAGL	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Changsha ¹⁹	GVBC	—	—	—	—	—	—	—	Hong Kong
Changshinloa ¹⁹	MPM	200	—	300, 600	P G	X	0.40	—	Great Britain
Chautala ¹⁹	GDNC	225	—	300, 600	P G	X	0.40	—	Great Britain
Chautier ²	KEGK	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Chao-Ho ¹⁹	XNW	—	Navy	—	O	—	—	—	China
Chaparel ^{9 131}	KEGT	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Chappaqua ¹⁸³	KURF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Chappell ¹⁰³	KEVS	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Charlbury	GBSN	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Charles Ausburne ¹⁰²	NUPR	—	Pan-American Petroleum and Transport Co., Inc.	300, 600	P G	N	—	—	United States of America
Charles E. Harwood ^{9 131}	WID	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.20	—	United States of America
Charles H. Cramp ^{9 131}	KDHH	500	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	N	0.40	—	United States of America
Charles L. Hutchinson ²	WMHU	150	Phoneur S.S. Co.	300, 600	P G	X	0.10 ¹¹⁹ 0.20 ¹¹¹	—	United States of America

	WPOU	300	Vacuum Oil Co., 61, Broadway, N.Y.	300, 450, 800	P G ..	X	0.40	United States of America
Charles M. Everest ^{9 131}	WFT	150	Detroit and Cleveland Navigation Co., Detroit (Mich.)	300, 800	P G ..	X	0.20	United States of America
Charles O. Jenkins ^{9 131}	KSQ	300	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 800	P G ..	X	0.40	United States of America
Charles Pratt ^{9 131}	FGR	300	Compagnie Générale Transatlan- tique, Paris	300, 800	P G ..	X	0.10	France
Charles Roux ^{9 131}	NABG	—	Navy	300, 800	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Charles S. Osbourne ^{9 9}	NFE	—	Navy	300, 800	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Charleston ^{9 9}	KDLA	300	Standard Oil Company	300, 450, 800	P G ..	X	0.40	United States of America
Charlie Watson ^{9 131}	WMUI	300	U.S. Shipping Board, Washington (D.C.)	300, 800	P G ..	X	0.40	United States of America
Charlotte ¹⁰³	FHC	150	A. et G. Vidor Fils, Boulogne-sur- mer	300, 800	P G ..	X	0.40	France
Charlotte FHC ¹	NMN	—	Navy	300, 800	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Charlotte MNM ^{9 9}	VEX	100	Victoria Harbour Lumber Co., Windsor, Ont.	300, 800	P ..	— ²⁷	0.40	Canada
Charlton ²¹	KLU	150	U.S. Steel Products Co., 30, Church St., New York (N.Y.)	300, 450, 800	P G ..	X	0.40	United States of America
Charlton Hall ^{9 131}	GFZM	250	Operated by the Amalgamated Wireless (Australia), Ltd.	300, 450, 800	P G ..	X	0.40	Great Britain
Charon GFZM ⁷¹	HOL	180	Sous-Secrétariat d'Etat des Ports de la Marine Marchande et des Pêches, 24, Rue du Boccador, Paris	300, 800	P G ..	X	0.40	France
Charpentier ¹	GJBC	100	Navy	300, 800	P G ..	X	0.10 ⁹² 0.20 ¹¹¹ 0.40 ¹¹²	Great Britain
Chartered ¹⁰	NUMK	—	Navy	300, 800	P G ..	N	0.40 ¹¹	United States of America
Chase ^{9 9}	FBN	200	Compagnie des Pêcheries Mari- times de l'Atlantique, la Rochelle	300, 600	P G ..	X	0.40	France
Chassiron ¹	FAXP	—	Navy	600, 800	P G ..	N	0.05	France
Chastang	FWT	200	Worms et Cie., Paris	300, 800	P G ..	X	0.40	France
Chateau-Latour ¹	FWR	200	Worms et Cie., Paris	300, 800	P G ..	X	0.40	France
Chateau-Palmier	ZSH	—	.. .. .	300, 800	P G ..	X	0.40	Great Britain
Chatham ZSH ¹⁹	KIDN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 800	P G ..	X	0.40	United States of America
Chattanooga KIDN ^{9 131}	NGI	—	Navy	300, 800	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Chattanooga NGI ^{9 9}	KDUW	—	U.S. Steel Products Co., 30, Church St., New York (N.Y.)	300, 450, 800	P G ..	X	—	United States of America
Chattanooga City ¹⁰⁸	GDK	180	.. .. .	300, 800	P G ..	N	0.40	Great Britain
Chaudière ¹⁹	NISV	—	.. .. .	300, 800	P G ..	N	—	United States of America
Chaumont NISV ¹⁰²	NIF	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Chauncey ^{9 9}	KIFK	200	U.S. Shipping Board, Washington (D.C.)	300, 800	P G ..	X	0.40	United States of America
Chautaugua ^{9 131}	FOF	150	A. Marty, 14, Cours Wilson, La Rochelle	300, 800	P G ..	X	0.40	France
Chauveau ¹	KJAA	300	U.S. Shipping Board, Washington (D.C.)	300, 800	P G ..	X	0.40	United States of America
Chebaulip ^{9 131}								

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Meters (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.	Country.
							Per Word.	Minimum per Radiotelegram.
Chef Mecanicien Mailhol ¹	FMD	350	Compagnie des Messageries Maritimes, 1, Rue Vignon, Paris	300, 450, 600, 800	P G	X	0.40	France
Chefoo Maru ¹	JKC	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Chelmsford	GKAV	—	Navy	—	P G	— ²⁷	—	Great Britain
Chelohsin ²¹	VGN	200	Union S.S. Co. of British Columbia, Vancouver, B.C.	300, 600	P G	—	0.40	Canada
Chellenham	GKAW	—	Navy	—	P G	X	—	Great Britain
Chennitiz ¹⁹	GBCJ	—	Navy	300, 600	P G	X	0.40 ¹¹¹	Great Britain
Chemung ⁹⁹	NARG	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Chenab ²¹	GWK	125	Siemens, Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	Great Britain
Chêne	FAOC	—	Navy	300, 800	P G	N	0.05	France
Cheniston ¹⁹	OCH	140	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	Great Britain
Chepadoo ¹³¹	KOFL	200	Navy	300, 600	P G	X	0.40	United States of America
Chepstow	GKAX	—	Navy	—	P G	—	—	Great Britain
Chepstow Castle ¹⁹	ZAN	150	Navigazione Libera Triestina, Trieste	300, 600	P G	N	0.40	Great Britain
Cherca ¹⁷	IYO	140	Nanyo Yusen Kaisha	300, 600	P G	X	0.40	Italy
Cheribon Maru ¹	JCW	400	Nanyo Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Cherokee ¹⁰³	KVK	200	Clyde S.S. Co., Pier 36, North River, New York (N.Y.)	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Cherry Branch ¹⁹	YZZ	160	Navy	300, 600	P G	X	0.40	Great Britain
Cherryleaf ¹⁹	ZZN	220	Navy	300, 600	P G	X	0.40	Great Britain
Chertsey ¹⁹	YDM	200	Navy	300, 600	P G	X	0.40	Great Britain
Cherwell	GFUY	—	Navy	—	P G	—	—	Great Britain
Chester ⁹⁹	NDG	—	Navy	300, 450, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Chester Kiwanis ^{9 131}	KDBP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Chester Sun ^{9 131}	WAS	300	Sun Company, Finance Building, Philadelphia (Pa.)	300, 450, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Chester Valley ⁹⁷	KOST	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	United States of America

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Class	Ship	Age	Company	Home Port	Home	Passes	Notes	Country
..	Chestnut Hill ⁸⁷	200	KVG	(Mass.) U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
..	Chetopa ⁸⁷	—	KDJI	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
..	Chew ⁸⁹	—	NEMZ	Navy	300, 600	P G	N	United States of America
..	Chewink ⁸⁹	—	NIJV	Navy	300, 600	P G	N	United States of America
..	Cheyenne GCRK ¹⁹	145	GCRK	—	300, 600	P G	X	Great Britain
..	Cheyenne NDH ⁸⁹	—	NDH	Navy	300, 600	P G	N	United States of America
..	Chezine ¹	200	FAD	Compagnie Nantaise de Navigation à Vapeur, Nantes	300, 600	P G	X	France
..	Chiapas ⁷¹	—	GCXV	Operated by Cayzer Irvine & Co., Ltd., 2, St. Mary Axe, London	300, 600	P G	X	Great Britain
..	Chicago FTI ¹	300	FTI	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	France
..	Chicago NDI ⁸⁹	—	NDI	Navy	300, 600	P G	N	United States of America
..	Chicago WAC ⁸⁷	200	WAC	Booth Fisheries Co., Incorp., Foot of Wall St., Seattle (Wash.)	300, 600	P G	X	United States of America
..	Chicago Bridge ¹⁰⁹	300	KECG	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
..	Chicago City ¹⁹	150	BQX	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	X	Great Britain
..	Chicago Maru ¹	350	JCC	—	300, 450, 600	P G	N	United States of America
..	Chickahominy ¹⁷	—	GFVR	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	Great Britain
..	Chickamauga ⁹ ¹³¹	300	KULC	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
..	Chickasaw ¹⁰¹	300	KOJR	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
..	Chickasaw City ⁹ ¹³¹	300	KUNZ	U.S. Steel Products Co., 30, Church St., New York (N.Y.)	300, 450, 600	P G	X	United States of America
..	Chicomilco ⁹ ¹³¹	300	KOLS	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
..	Chifuku Maru ¹	500	JHZ	Kokusai Kisen Kaisha	300, 600	P G	—	Japan
..	Chignecto ¹⁹	220	MBV	Navy	300, 600	P G	—	Great Britain
..	Chihaya ¹	—	JWB	Operated by Cayzer Irvine & Co., Ltd., 2, St. Mary Axe, London	300, 600	O	—	Japan
..	Chihuahua ⁷¹	—	GFZY	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	X	Great Britain
..	Chikugo Maru ¹	200	JCUA	Navy	300, 600	P G	—	Japan
..	Chikuma ¹	—	JLC	Navy	300, 600	O	—	Japan
..	Chikuzen Maru ¹	200	JDK	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	—	Japan
..	Child ¹	250	CDP	Braun & Blanchard Calle Blanco, 855, Valparaiso	300, 600	P G	—	Chile
..	Childs ⁸⁹	—	NULN	Navy	300, 600	P G	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-tele-gram.	
Chile GCRL ¹⁹	GCRL	220	—	300, 600	P G	N	0.40	—	Great Britain
Chile OZV ⁴⁰	OZV	250	Aktieselskabet Det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Chili ¹	—	300	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	— ²⁷	0.40	—	France
Chiller ^{1d}	—	—	—	—	—	—	—	—	—
Chili Maru ¹	BUQ JKE	500	Kokusai Kisen Kaisha	300, 600 300, 600	P G P G	X 0800 to 1100 1400 to 1700 2000 to 2400	0.40 0.40	—	Great Britain Japan
Chilka ¹⁹	—	—	—	—	—	—	—	—	—
China MMU ¹⁹	GDNJ MMU	250	China Mail S.S. Co., Sacramento and Montgomery Sts., San Francisco	300, 600 300, 600	P G P G	X X	0.40 0.40	—	Great Britain
China WWA ^{9 131}	WWA	300	Standard Transportation Co., N.Y., 26 Broadway, New York (N.Y.)	300, 450, 600	P G	N	0.40	—	United States of America
China Arrow ^{9 131}	KDGV	300	Kawasaki Kisen Kaisha	300, 600	P G	N	—	—	United States of America
China Maru ¹	JCJ	500	—	300, 600	P ³⁵	—	—	—	Japan
Chincha ^{9 131}	KJZ	300	Green Star Steamship Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	United States of America
Chinde ¹	CRAA	200	—	300, 600 300, 600	—	—	0.40	—	Mozambique
Chinese Prince ¹⁹	YJD	—	—	300, 600	P G	X	0.40	—	Great Britain
Chindwara ¹⁹	GAR	170	—	300, 600	P G	X	0.40	—	Great Britain
Chindwin ²¹	GWG	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 600	P G	1000 to 1200 1600 to 1800 2000 to 2400	0.40	—	Great Britain
Chinkou ¹⁹	MKO	170	—	300, 600	P G	X	0.40	—	Great Britain
Chios ¹	SVB	100-150	Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G	X	0.40	4.00	Greece
Chipehung ¹⁰³	WBIA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Chippewa KDJS ²	KDJS	150	Independent S.S. Co., Foot Orleans St., Detroit (Mich.)	300, 600	P G	— ²⁷	0.20 ¹⁸	—	United States of America
Chippewa VEH ²¹	VEH	100	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	—	0.40	—	Canada
Chirripo ¹⁹	GDCT	—	—	300, 600	P G	X	0.40	—	Great Britain
Chislanc ¹	FBS	—	Mouton, 17, Boulevard Henri IV, Paris	—	P G	X	0.40	—	France

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Chiswick ¹⁹	BNX	140	—	—	—	PG	—	—	0.40	Great Britain
Chitton ¹⁹	OFJ	—	—	—	—	PG	—	—	0.40	Great Britain
Chitose ¹	JLB	—	—	—	—	O	—	—	—	Japan
Chitose Maru ¹	JCEA	400	—	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	PG	—	0.40	Japan	
Chivichaga ²	TNA	150	—	Compania Naviera Bermeo, Bilbao	300, 600	PG	—	0.30	Spain	
Cayoda ¹	JUP	—	—	Navy	—	O	—	—	—	Japan
Chluncky ¹⁷	UVB	140	—	Navigatione Generale Gerolimich & Comp., Societa en Azioni, Trieste	300, 600	PG	—	0.40	Italy	
Chosen Maru ¹	JPV	200	—	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600, 1,800	PG	—	0.40	Japan	
Chow Tai ²¹	GDX	—	—	General Steam Navigation Co., Ltd.	300, 450, 600	PG	—	0.40	Great Britain	
Choyo Maru ¹	JOY	400	—	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	PG	—	0.40	Japan	
Christian Börs ¹	LDU	250	—	(Armateur) Vilhelm Torkildsen, Bergen	300, 450 600	PG	—	0.40	Norway	
Christian Horn ³⁵	DCR	200	—	(Armateur) Olaf Orvig, Bergen	300, 450, 600	PG	—	0.40	Germany	
Christian Krogh ¹	TQN	200	—	(Armateur) Bergh & Helland, Bergen	300, 450, 600	PG	—	0.40	Norway	
Christian Michelsen ¹	ATW	600	—	Bergen	300, 600	PG	—	0.40	Norway	
Christiansburg ⁴⁰	OIB	300	—	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450, 600, 800	PG	—	0.40	Denmark	
Christina Rueda ¹	TIU	100	—	Garrigos é Hijos, Grao (Valencia)	300, 600	PG	—	0.30	Spain	
Christopher Columbus ^{9 131}	WTF	150	—	Goodrich Transit Co., Foot of Michigan Ave., Chicago (Ill.)	300, 600	PG	—	0.10	United States of America	
Chronos ³	VKJ	300	—	—	300, 600	PG	—	0.20 ⁸ 0.40 ⁵	Australian Commonwealth	
Chrysanthemum	GEZB	—	—	Navy	—	PG	—	—	Great Britain	
Chu-Chien	XON	—	—	Navy	—	O	—	—	China	
Chu-Kwan	XOG	—	—	Navy	—	O	—	—	China	
Chuky ¹⁹	GJKT	—	—	Navy	300, 450, 600	PG	—	0.40	Great Britain	
Chupra ¹⁹	GPU	170	—	—	300, 600	PG	—	0.40	Great Britain	
Churruca ¹⁹	GFRB	—	—	—	300, 450, 600	PG	—	0.40	Great Britain	
Chu-Tai	XOA	—	—	Navy	—	O	—	—	China	
Chu-Fung	XOD	—	—	Navy	—	O	—	—	China	
Chu-Yew	XOY	—	—	Navy	—	O	—	—	China	
Chu-Yu	XOU	—	—	Navy	—	O	—	—	China	
Chybassa ¹⁹	MYF	180	—	—	300, 600	PG	—	0.40	Great Britain	
Choissa ¹	SVG	150	—	Compagnie Nationale Hellénique de Navigation	300, 600	PG	—	0.40	Greece	
Cicala	GFOH	—	—	Navy	—	PG	—	—	Great Britain	
Cicerone ¹⁷	ICCG	190	—	Camuzzi Ing Carlo, Genoa	300, 600	PG	—	0.40	Italy	
Ciclope	ICQ	—	—	Navy	—	PG	—	—	Italy	
Cid (El) KKT ²	KKT	200	—	Southern Pacific Company, Pier 49, North River, New York (N.Y.)	300, 450, 600	PG	—	0.40 ¹¹	United States of America	
Cid GJMF ¹⁹	GJMF	—	—	Hijos de J. Taya, Barcelona	300, 600	PG	—	0.40	Great Britain	
Cievana ¹	TIR	150	—	Navy	300, 600	PG	—	0.30	Spain	
Cigno	IAAP	—	—	—	—	PG	—	—	Italy	

Shipboard Stations—Continued

Name.	Call Signal	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Cilicia ¹⁷	..	140	Lloyd Triestino Società di Navigazione a Vapore, Trieste	300, 600	PG ..	X	0.40	—	Italy
Cilurnum ¹⁹	..	140	—	300, 600	PG ..	X	0.40	—	Great Britain
Cimbrier ¹⁹	..	140	—	300, 600	PG ..	X	0.40	—	Great Britain
Cine Terre ¹⁹	..	100-150	Navy	300, 800	PG ..	N	0.05	—	France
Cinco d'Oubro	300, 600	O ..	N	—	—	Portugal
Cinco d'Oubro	300, 600	PG ..	X	0.20	—	United States of America
Cinco d'Oubro	300, 600	PG ..	N	0.20 ¹¹	—	United States of America
Cincinnati ¹⁰¹	300, 600	PG ..	N	0.40 ¹¹²	—	France
C.I.P. ¹	..	250	Compagnie de Navigation Mixte, 54, Rue Canabière, Marseilles	300, 450, 600, 800	PG ..	X	0.40	—	France
Circassia ¹⁹	..	100	—	300, 600	PG ..	X	0.40	—	Great Britain
Circassie ¹	..	200	Compagnie de Navigation Paquet, Marseilles	300, 600	PG ..	X	0.40	—	France
Cire ¹⁷	..	190	Navigation Générale Italiana, Genoa	300, 600	PG ..	X	0.40	—	Italy
Circo Shell ¹⁹	..	185	—	300, 600	PG ..	X	0.40	—	Great Britain
Circinus ^{9 131}	..	300	Green Star Steamship Corp., 120, Broadway, N.Y.	300, 450, 600	PG ..	X	0.40	—	United States of America
Cirinaici	Navy	..	..	..	..	..	..
Cirilo Amoro ¹	..	150	Compagnia Transmediterranea, Barcellona	300, 600	PG ..	N	0.30	3.00	Italy
Ciscar ¹⁹	—	300, 600	PG ..	X	0.40	—	Spain
Cisneros GFRD ¹⁹	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Cisneros TNE ¹	..	200	Manuel Lopez, Marin, Barcelona	300, 600	PG ..	X	0.40	—	Great Britain
Cissy ¹	..	400	(Armateur) Thorp & Wiese, Bergen	300, 600	PG ..	N	0.30	3.00	Spain
Città di Bengasi ¹⁷	..	190	Esercizio Navigazione di Stato, Rome	300, 600	PG ..	X	0.40	—	Italy
Città di Cagliari ¹⁷	..	190	Esercizio Navigazione di Stato, Rome	300, 600	PG ..	X	0.40	—	Italy
Città di Catania ¹⁷	..	190	Esercizio Navigazione di Stato, Rome	300, 600	PG ..	X	0.40	—	Italy
Città di Genova ¹⁷	..	190	Società Industriale Trasporti Marittima, Genoa	300, 600	PG ..	X	0.40	—	Italy
Città di Lecce ¹⁷	..	140	Puglia Società di Navigazione a Vapore, Bari	300, 600	PG ..	X	0.40	—	Italy
Città di Messina ¹⁷	..	140	Perce Brothers, Naples	300, 600	PG ..	X	0.40	—	Italy
Città di Milano	Navy	300, 600	PG ..	X	0.40	—	Italy

Città di Palermo ¹⁷	IWE	140	Anonima Genovese Armanienti E. Trasporti Società di Navigazione, Genova	300, 600	P.G.	..	X	0.40	—	Italy
Città di Siracusa ¹⁷	IES	190	Esercizio Navigazione di Stato, Rome	300, 600	P.G.	..	X	0.40	—	Italy
Città di Trieste ¹⁷	INE	190	Sicilia Società di Navigazione, Rome	300, 600	P.G.	..	X	0.40	—	Italy
Città di Tripoli ¹⁷	INP	190	Sicilia Società di Navigazione, Rome	300, 600	P.G.	..	X	0.40	—	Italy
Cite de Verdun ¹	UKS	180	Société les Pêcheries de la Mer du Nord	300, 600	P.G.	..	X	0.40	—	France
City ¹⁹	BCD	150	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Adelaide ¹⁹	GDPIX	200	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Agra ¹⁹	MNZ	175	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Alexandria ¹⁹	GBDQ	—	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Alma ⁸⁷	KUBP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	..	X	0.40	—	United States of America
City of Almeida ⁸⁷	KUCQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	..	X	0.40	—	United States of America
City of Alton ⁸⁷	KONZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	..	X	0.40	—	United States of America
City of Amiens ¹⁹	YKP	—	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P.G.	..	X	0.40	—	United States of America
City of Atlanta ¹⁹	KFB	200	—	300, 600	P.G.	..	N	0.40	—	United States of America
City of Auckland ¹⁹	GBDK	—	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P.G.	..	X	0.40	—	United States of America
City of Augusta ¹⁹	KFJ	300	—	300, 600	P.G.	..	N	0.40	—	United States of America
City of Bagdad ¹⁹	CDKQ	—	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P.G.	..	X	0.40	—	United States of America
City of Bangor ¹⁹	KRH	150	Eastern S.S. Lines, India Wharf, Boston (Mass.)	300, 600	P.G.	..	X	0.40	—	United States of America
City of Baroda ¹⁹	EOE	170	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Batavia ¹⁹	GBRP	—	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Belfast ¹⁹	BBJ	220	Midland Railway Co.	300, 400, 600	P.G.	..	X	0.10 ⁸⁷	—	Great Britain
City of Benares ¹⁹	GCJ	250	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Berkeley ¹⁹	KOZQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	..	X	0.40	—	United States of America
City of Birmingham ¹⁹	BDS	135	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Bombay ¹⁹	GUJ	160	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Boston ¹⁹	GFRS	—	—	300, 450, 600	P.G.	..	X	0.40	—	Great Britain
City of Bradford ¹⁹	BCZT	225	Great Central Railway Company	300, 600	P.G.	..	X	0.10 ⁸⁷	—	Great Britain
City of Brisbane ¹⁹	GDNX	—	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Bristol ¹⁹	GCPI	150	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Brockton ¹⁹	KXO	—	New England S.S. Co., Fall River (Mass.)	300, 600	P.G.	..	X	— ¹¹⁷	—	United States of America
City of Buffalo ¹⁹	WFQ	150	Cleveland and Buffalo Transit Co., Cleveland (Ohio)	300, 600	P.G.	..	X	0.20	—	United States of America
City of Cairo ¹⁹	YVY	200	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Calcutta ¹⁹	GCPI	200	—	300, 600	P.G.	..	N	0.40	—	Great Britain
City of Cambridge ¹⁹	GFOL	—	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Canton ¹⁹	YSM	180	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Chester ¹⁹	MAG	150	—	300, 600	P.G.	..	X	0.40	—	Great Britain
City of Christiania ¹⁹	GFMV	—	—	300, 450, 600	P.G.	..	X	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
City of Cleveland III ¹³¹	WEA	125	Detroit and Cleveland Navigation Co., Detroit (Mich.)	300, 600	P G ..	N	0.20	—	United States of America
City of Columbus ¹³¹	KFA	200	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P G ..	N	0.40	—	United States of America
City of Corinth ¹⁹	XEX	135	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	Great Britain
City of Dalhart ¹³¹	KDNP	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Delhi ¹⁹	GIC	150	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 600	P G ..	N	0.40	—	Great Britain
City of Detroit II ¹³¹	WBC	125	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P G ..	N	0.20	—	United States of America
City of Detroit III ¹³¹	WEF	125	Ocean S.S. Co. of Savannah, Pier 35, North River (N.Y.)	300, 450, 600	P G ..	N	0.20	—	United States of America
City of Dunedin ¹⁹	GBTN	—	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Dunkirk ¹⁹	GDD	180	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Durban ¹⁹	GDSN	—	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Durham ¹⁹	GCPW	160	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Edinburgh ¹⁹	GNC	190	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Elwood ¹⁹	KDMV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Erie ¹³¹	WEP	150	Cleveland & Buffalo Transit Co., Cleveland (Ohio)	300, 600	P G ..	X	0.20	—	United States of America
City of Eureka ¹³¹	KEFT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Evansville ¹⁹	GJNF	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
City of Everett ¹³¹	KUQ	150	Standard Oil Company of New York, Incorp., 26, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
City of Exeter ¹⁹	MSW	230	—	300, 600, 2,100	P G ..	X	0.40	—	Great Britain
City of Fairbury ²⁷	KISR	—	U.S. Shipping Board, Washington (D.C.)	2,200 c.w., 300, 600	P G ..	X	0.40	—	United States of America
City of Flint ¹³¹	KUCV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Florence ¹⁹	YYQ	145	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Fort Worth ²⁷	KDAW	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
City of Freeport ¹³¹	KFSV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America

City of Genoa ¹⁵	GBET	—	—	300, 600	P G	—	—	0.40	Great Britain
City of Glasgow ¹⁶	GDRS	175	—	300, 600	P G	—	—	0.40	Great Britain
City of Hankow ¹⁶	MUG	186	—	300, 600	P G	—	—	0.40	Great Britain
City of Harard ¹⁶	GBFK	—	—	300, 450, 600	P G	—	—	0.40	Great Britain
City of Honolulu ^{9 131}	KUSD	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	—	—	0.40	United States of America
City of Joliet ¹⁰³	KUJR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	0.40	United States of America
City of Karachi ¹⁹	GBW	200	—	300, 600	P G	—	—	0.40	Great Britain
City of Lahore ¹⁹	GCPS	200	—	300, 600	P G	—	—	0.40	Great Britain
City of Leeds ⁷¹	GCZS	—	Great Central Railway Co.	300, 600	P G	—	—	0.10 ⁸⁷	Great Britain
City of Lincoln ¹⁹	GDP	150	—	300, 600	P G	—	—	0.40	Great Britain
City of London GBLV ¹⁹	GBLV	100	Aberdeen Steam Navigation Co., Ltd.	300, 600	P G	—	—	0.10 ⁸⁷	Great Britain
City of London GCPX ¹⁹	GCPX	140	Ellerman Lines, Ltd.	300, 600, 2,100, 2,200 C.W.	P G	—	—	0.40	Great Britain
City of Losburg ^{9 131}	KUTK	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	0.40	United States of America
City of Los Angeles ⁸⁷	KOZC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	—	—	0.40	United States of America
City of Lowell ¹⁰³	KXBB	150	New England S.S. Co., Fall River (Mass.)	300, 530, 600	P G	—	—	0.40 ¹¹⁷	United States of America
City of Lucknow ¹⁹	GBDN	—	—	300, 450, 600	P G	—	—	0.40	Great Britain
City of Madras ¹⁹	MCY	160	—	300, 600	P G	—	—	0.40	Great Britain
City of Madrid ¹⁹	MTM	160	—	300, 600	P G	—	—	0.40	Great Britain
City of Manchester ¹⁹	ZGC	170	—	300, 600	P G	—	—	0.40	Great Britain
City of Manila ¹⁹	ZHF	170	—	300, 600	P G	—	—	0.40	Great Britain
City of Marseilles ¹⁹	GCPY	250	—	300, 600	P G	—	—	0.40	Great Britain
City of Melbourne ¹⁰	GBPR	170	—	300, 600	P G	—	—	0.40	Great Britain
City of Miami ⁸⁷	WDI	300	Havana-American S.S. Corp.	300, 600	P G	—	—	0.20	United States of America
City of Milan ¹⁹	GBND	—	—	300, 600	P G	—	—	0.40	Great Britain
City of Montgomery ^{9 131}	KFY	300	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P G	—	—	0.40	United States of America
City of Nagpur ¹⁹	GJLP	—	—	300, 450, 600, 2,100, 2,200, 2,400	P G	—	—	0.40	Great Britain
City of Naples ¹⁹	GCPT	150	—	300, 600	P G	—	—	0.40	Great Britain
City of Newcastle ¹⁹	YU	180	—	300, 600	P G	—	—	0.40	Great Britain
City of Norwich ¹⁹	GXA	170	—	300, 600	P G	—	—	0.40	Great Britain
City of Omaha ¹⁰³	KOZB	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	0.40	United States of America
City of Oran ¹⁹	YTB	170	—	300, 600	P G	—	—	0.40	Great Britain
City of Oxford ¹⁹	GBYR	—	—	300, 600	P G	—	—	0.40	Great Britain
City of Palermo ¹⁹	GBDW	—	—	300, 600	P G	—	—	0.40	Great Britain
City of Para ¹⁰¹	WWF	200	Pacific Mail S.S. Co., 508, Market St., San Francisco (Cal.)	300, 600	P G	—	—	0.40 ¹²²	United States of America
City of Paris ¹⁹	GFQM	—	—	300, 450, 600, 2,100, 2,200	P G	—	—	0.40	Great Britain
City of Pekin ¹⁹	GDSJ	200	—	300, 600	P G	—	—	0.40	Great Britain
City of Pittsburgh ¹⁹	GFSC	—	—	300, 450, 600	P G	—	—	0.40	Great Britain
City of Poona ¹⁹	GBB	230	—	300, 600	P G	—	—	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
City of Puebla ^{9 131}	WGQ	200	Puebla S.S. Corp., 17, Battery Place, New York (N.Y.)	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
City of Raungon ¹⁹	MTP	160	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Rayville ^{9 141}	KDGS	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Reno ⁹⁷	KVSK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	—	0.40	—	United States of America
City of Rheims ¹⁹	XEP	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
City of Rockland ^{9 131}	KRI	150	Eastern S.S. Lines, India Wharf, Boston (Mass.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Rome ^{9 131}	KQZ	200	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P G ..	N	0.40	—	United States of America
City of Savannah ^{9 131}	KFK	200	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 450, 600	P G ..	N	0.40	—	United States of America
City of Seattle ^{9 131}	WGA	150	—	300, 600	P G ..	N	0.40	—	United States of America
City of Shanghai ¹⁹	EMM	180	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Sherman ⁹⁷	KUCS	300	Miami S.S. Company	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Simla ¹⁹	GFON	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
City of Smyrna ¹⁹	EH	155	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Sparta ¹⁹	YUK	180	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Spokane ⁹⁷	KILL	200	—	300, 600	P G ..	X	0.40	—	United States of America
City of St. Ignace ^{9 131}	WEG	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.20	—	United States of America
City of St. Joseph ¹⁰³	KOSM	300	Detroit and Cleveland Navigation Co., Detroit (Mich.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of St. Louis ^{9 131}	KFZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
City of Sydney GCSD ¹⁹	GCSD	—	Ocean S.S. Co. of Savannah, Pier 35, North River, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
City of Sydney ²	KKEI	200	—	300, 600	P G ..	X	0.40	—	Great Britain
City of Taunton ^{9 131}	KXL	75	L. A. Pederson, 112, Market St., San Francisco (Cal.)	300, 550, 600	P G ..	X	0.15 ¹¹⁷	—	United States of America
City of Tokio ¹⁹	GFMW	—	New England S.S. Company, Fall River (Mass.)	300, 450, 600	P G ..	X	0.40	—	United States of America
City of Valencia ¹⁹	GBDP	—	—	300, 600	P G ..	X	0.40	—	Great Britain

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City of Vancouver ²	VGBD	250	J. Coughlan & Sons, Vancouver, (B.C.)	300, 600	P	— ²⁷	0.40	Canada
City of Vernon ^{3 131}	KUNS	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
City of Versailles ¹⁹	YNO	—	—	300, 450, 600	P G	X	0.40	Great Britain
City of Victoria ²	VGNT	250	J. Coughlan & Sons, Vancouver (B.C.)	300, 600	P	— ²⁷	0.40	Canada
City of Weatherford ^{3 131}	KUVC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
City of Westminster ¹⁹	GBJQ	—	—	300, 450, 600	P G	X	0.40	Great Britain
City of Winchester ¹⁹	LUC	135	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
City of Yokohama ¹⁹	GFXL	—	—	300, 450, 600	P G	X	0.40	Great Britain
City of York ¹⁹	GAO	250	—	300, 600	P G	X	0.40	Great Britain
Ciudad de Buenos Aires ¹	LQC	135	Nicolas Milhanovich, Compania, Ltd., Buenos Aires	300, 600	P G	N	0.40	Argentine Republic
Ciudad de Cadiz ¹	EDZ	108	Compania Trasatlantica, Barcelona	300, 600	P G	N	0.30	Spain
Claes Horn	SBO	—	Navy	300, 600	O ³⁸	N	—	Sweden
Clairton ^{3 131}	KIKR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Clam ¹⁹	YHZ	130	—	300, 600	P G	X	0.40	Great Britain
Clameur	FACM	—	Navy	300, 800	P G	N	0.05	France
Clan Alpine ¹⁹	XJE	140	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Clan Buchanan ¹⁹	YVZ	145	—	300, 600	P G	—	0.40	Great Britain
Clan Chattan ¹⁹	ZHS	135	—	300, 600	P G	—	0.40	Great Britain
Clan Chisholm ¹⁹	LSF	125	—	300, 600	P G	—	0.40	Great Britain
Clan Colquhoun ¹⁹	YZA	145	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Clan Cumming ¹⁹	YOH	150	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Clan Kenney ¹⁹	EQI	150	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Clan Kenneth ¹⁹ ..	YES	—	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Lamont ¹⁹ ..	YON	200	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Lindsay ¹⁹ ..	YOO	120	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macaulay ¹⁹ ..	YJQ	125	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macbean ¹⁹ ..	KJD	120	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macbeth ¹⁹ ..	YVV	200	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macbrayne ¹⁹ ..	YPS	160	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macbride ¹⁹ ..	ZHT	150	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macfarlane ¹⁹ ..	GJCV	—	—	300, 450, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Maegillivray ¹⁷ ..	GVS	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macindoe ¹⁹ ..	GDXN	175	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Clan Macquarrie ²¹	GVL	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 X	0.40	—	Great Britain
Clan Macartagart ¹⁹	GDPV	—	—	300, 600	P G	X	0.40	—	Great Britain
Clan Mactavish ¹⁹	GDPW	—	—	300, 600	P G	X	0.40	—	Great Britain
Clan Marvicar ¹⁹	XHB	120	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Clan Macwilliam ¹⁹	LTS	100	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Malcolm ¹⁹	ZQK	140	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Matheson ¹⁹	MZQ	150	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Menzies ¹⁹	LSH	—	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Monroe ¹⁹	EIS	140	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Morrison ¹⁹	EIR	200	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Clan Murdoch ¹⁹	ZSA	160	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain

Shipboard Stations

III

CLAN MURRAY ²²	LSK	110		300, 000	P G	0900 to 1200 1400 to 1800 2000 to 2200	0.40	VEGETA DEVIANT
Clan Ogilvy ⁷¹	GVV	125	—	300, 450, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	Great Britain
Clan Ranald ¹⁹	EIT	140	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clan Ross ⁷¹	GVU	125	Siemens Bros. & Co., Ltd., Wood- with, London, S.E.18	300, 450, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clan Sinclair ¹⁹	YZB	150	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clan Stuart ¹⁹	ZPN	145	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clan Urquhart ¹⁹	YZG	190	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clara Blumenfeld ¹⁰	ONX	100-150	Association Maritime Belge, Ant- werp	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Belgium
Clara Camus ¹⁷	UUX	140	Navigazione Generale Gerolmich & Comp., Società in Azioni, Trieste	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Italy
Clare ^{9 131}	KNE	200	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	United States of America
Claremont ²	KUBD	200	Hart-Wood Lumber Co., San Francisco (Cal.)	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	United States of America
Clarissa Radcliffe ¹⁹	EWV	190	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clark Mills ¹⁰	KOCQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	United States of America
Claro ¹⁰	ODV	120	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Clas Fleming	SCI	—	Navy	—	O ³⁹	—	—	Sweden
Classic ¹⁹	ZCF	—	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.05 ⁸⁷	Great Britain
Claudio ¹	CMK	100	Compania Naviera Euz Kera, Bilbao	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.30	Spain
Claudeus ^{9 131}	KOQB	300	Green Star Steamship Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	United States of America
Clavarack ^{9 131}	KOLL	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	United States of America
Claxton ²⁹	NEQZ	—	Navy	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Claymont ¹²	BAH	—	—	300, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.40	Great Britain
Claymore FBWC	FBWC	—	Navy	300, 800	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.05	France
Claymore GFPR ¹⁹	GFPR	—	—	300, 450, 600	P G	2000 to 2200 0600 to 0800 0900 to 1200	0.10 ⁸⁷ 1.00 ⁸⁷	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Clayton ⁷¹	GCTF	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Cleapool ⁷¹	LTI	130	—	300, 600	P G	X	0.40	—	Great Britain
Clearton ¹⁹	YGI	300	—	300, 600	P G	X	0.40	—	Great Britain
Cleawater ^{9 131}	KUGD	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cleaway ¹⁹	MYH	210	—	300, 600	P G	X	0.40	—	Great Britain
Clematis EOB ¹⁹	EOB	—	—	300, 600	P G	X	0.40	—	Great Britain
Clematis GEZC	GEZC	—	Navy	—	P G	—	—	—	Great Britain
Clemenceau ¹⁹	ZRH	120	—	300, 600	P G	X	0.40	—	Great Britain
Clemence C. Morse ⁹⁷	KUGG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Clemens A. Reiss ^{9 131}	WNH	150	Reiss S.S. Company, 402, Rockefeller Building, Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
Clement Smith ^{9 131}	KDGO	300	Oil Transport Company	300, 600	P G	X	0.40	—	United States of America
Cleopatra III ¹⁹	GDPQ	—	—	300, 600	P G	X	0.40	—	Great Britain
Cleopatra GEFO	GEFO	—	Navy	—	P G	—	—	—	Great Britain
Cleopatra IVU ¹⁹	IVU	190	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	300, 600	P G	—	0.40	—	Italy
Cletus Schneider ²	KMEO	175	Paisley S.S. Company, Cleveland (Ohio)	300, 600	P G	X	0.10	—	United States of America
Cleveland ARV ¹	ARV	300	(Armateurs) Nieuwejaar & Hansen, Bergen	300, 600	P G	X	0.40	—	United States of America
Cleveland NDM ⁹⁹	NDM	—	Navy	300, 600	P G	X	0.40	4.00	Norway
Clifford F. Moll ²	KDWA	150	American Steamship Company	300, 600	P G	N	0.20 ¹³¹	—	United States of America
Cliffwood ^{9 131}	KORX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40 ¹³²	—	United States of America
Cliftonball ¹⁹	EKV	110	—	300, 450, 600	P G	X	0.10 ¹³²	—	United States of America
Cliffflower ¹⁹	YMA	145	—	300, 600	P G	X	0.40	—	Great Britain
Clinique ^{19 131}	IGT	—	Navy	300, 600	P G	—	—	—	Italy
Clincho ^{9 131}	KENX	150	Clinchfield Navigation Company, 24, Broad St., New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Clintonia ¹⁹	YHT	145	—	300, 600	P G	X	—	—	Great Britain
Clio IAAO	IAAO	—	Navy	300, 600	P G	X	0.40	—	Italy
Clio IXC ¹	TXC	150	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	—	4.00	Holland

Shipboard Stations

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Station	Ship	Class	Capacity	Notes	Company	Port of Origin	Port of Destination	Remarks
Clyde	Clyde	131	200	..	Royal Indian Marine (D.C.)	U.S. Shipping Board, Washington	India	0.40 ³⁴
C. Lopez y Lopez ¹	EDH	269	300	..	Company Trasatlantica, Barcelona	Navy	Spain	0.40
Clontarf ²	FACL	..	300	..	Operated by the Mediterranean	Navy	Spain	0.30
Clontarf ³	ZIS	..	300	..	Cargo Steamers, Ltd., 12, Nicolas Lane, London, E.C.4.	Navy	Spain	0.05
Cluny Castle ¹⁹	GCRN	200	300	..	Kokusai Kisen Kaisha	..	Great Britain	0.40
Clunehall ¹⁹	GXW	140	300	..	..	..	Great Britain	0.40
Clyde Maru ¹	JCZ	400	300	..	..	..	Japan	0.40
Clydenede ¹⁹	BOP	180	300	..	..	..	Great Britain	0.40
Clydestate BDF ¹⁹	BDF	..	300	..	..	..	Great Britain	0.40
Clydesdale GFRM ¹⁹	GFRM	100	300	..	..	..	Great Britain	0.10 ⁸²
Clyne Rock ¹⁹	GDKL	300	300	..	..	..	Great Britain	0.40
Coahoma County ⁹⁷	KOMP	300	300	..	..	..	United States of America	0.40
Coalinga ¹⁰¹	WOT	150	300	..	..	..	United States of America	0.40 ¹²²
Coamo ¹⁰³	KGA	200	300	..	..	..	United States of America	0.40
Coastwise ⁹ 131	KUZ	300	300	..	..	..	United States of America	0.40
Coatsworth ¹⁹	GCDB	175	300	..	..	..	Great Britain	0.40
Coaxer ¹⁰⁵	WPUU	200	300	..	..	..	United States of America	0.40
Coblentz ¹⁹	GFCP	..	300	..	..	..	Great Britain	0.15 ⁸²
Cochrane ¹⁹	GFPX	..	300	..	..	..	Great Britain	0.40
Cocito	IFJ	..	..	..	..	..	Italy	..
Cockaponset ⁹⁷	KOFN	300	300	..	..	..	United States of America	0.40
Cockburn Sound Base	VKR	..	..	..	..	..	Australian Commonwealth	..
Cockchafer	GFON	..	..	..	..	..	Great Britain	..
Coronada ¹⁹	GCRP	210	300	..	..	..	Great Britain	0.40
Cody ⁹⁷	KDEX	300	300	..	..	..	United States of America	0.40
Coelieda ⁹ 131	KOVV	300	300	..	..	..	United States of America	0.40
Coëtlogon	FBCT	..	..	..	..	..	France	0.05
Cœur d'Alene ¹⁰⁵	KOVT	300	300	..	..	..	United States of America	0.40
Coghlan ¹⁰²	NUPK	..	..	..	..	..	United States of America	..
Cogne ¹⁷	IMF	140	300	..	..	..	Italy	0.40
Cogolin ¹	FKM	200	300	..	..	..	France	0.40
Cohasset ¹⁰³	WJUI	300	300	..	..	..	United States of America	0.40
Coimbra ⁶¹	CSK	100-150	300	..	..	..	Portugal	0.40
Cokato ¹⁰³	WMUE	300	300	..	..	..	United States of America	0.40

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Cokesit ¹⁰⁹	WQUA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Colaba ¹⁰	GBT	175	—	300, 600	PG ..	X	0.40	—	Great Britain
Coldbrook ¹⁰³	KQK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Cold Harbor ^{9 131}	RUBB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Cold Spring ^{9 131}	KIQK	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Cold Water ⁹⁷	KUCX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Cole ⁹⁹	NEST	—	Navy	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Colheun ⁹⁹	NAJL	—	Navy	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Colima ⁷¹	GDLY	—	Operated by Cayzer Irvine & Co., Ltd., 2, St. Mary Axe, London	300, 600	PG ..	N	0.40 ¹¹²	—	United States of America
Colin H. Livingstone ⁹⁷	KDIN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Collamer ^{9 131}	KOZZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	Great Britain
Colleen Bawn ⁷¹	YWM	110	Launceston & Yorkshire Railway Company	300, 600	PG ..	X	0.40	—	United States of America
Collagian ¹⁹	MTL	—	—	300, 600	PG ..	X	0.10 ⁸⁷	1.00 ⁸⁷	United States of America
Collingham ¹⁹	EJZ	—	—	300, 600	PG ..	X	0.40	—	Great Britain
Collingsworth ⁹⁷	KUKX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Collingswood ²¹	CKP	100	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P ..	— ⁸⁷	0.40	—	Canada
Collinson	GEZF	—	Navy	—	PG ..	—	—	—	Great Britain
Colmar FAXE	FAXE	—	Navy	600, 800	PG ..	N	0.05	—	France
Colmar FDR	FDR	—	Compagnie les Armateurs Français, Paris	—	PG ..	X	0.40	—	France
Colne	GFUX	—	Navy	—	PG ..	—	—	—	Great Britain
Colocolo	CBW	—	Navy	—	PG ..	—	—	—	Chile
Colombe	FBCO	—	Navy	300, 800	PG ..	N	0.05	—	France
Colombia SLK ¹	SLK	150	Rederaktiebolaget Caribbea, Landskrona	300, 600	P ..	X	0.40	4.00	Sweden

Shipboard Stations

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Colombia	WBH	300	Pacific Mail S.S. Co., 508, Market St., San Francisco (Cal.)	300, 600, 1,300	P G	N	0.40	United States of America
Colombier ¹⁰	OOC	100-150	Lloyd Royal Belge, Antwerp	300, 600	P G	N	0.40	Belgium
Colombo ITF ¹⁷	ITF	270	Transoceanic Società di Navigazione, Naples	300, 450, 600	P G	N	0.40	Italy
Colombo GEFR	GEFR	—	Navy	—	P G	—	—	Great Britain
Colon GCKD ¹⁰	GCKD	120	Panama R.R. Co., 24, State St., New York (N.Y.)	300, 600	P G	X	0.40	Great Britain
Colon KMX ¹⁷	KMX	250	—	300, 450, 600	P G	N	0.40	United States of America
Colonel Albert Todd ¹⁰²	WYBI	—	Standard Oil Co. of California, Inc., Sheldon Building, San Francisco (Cal.)	300, 600	P G	N	0.40	United States of America
Col. E. L. Drake ^{9 131}	WTS	150	—	300, 450, 600	P G	X	—	United States of America
Colonel Garland N. Whistler ¹⁰²	WYBJ	—	—	300, 600	P G	N	—	United States of America
Colonel George Armistead ²	WYAG	—	U.S. Signal Corps, War Dept., Washington (D.C.)	600	O	X	—	United States of America
Colonel George F. E. Harrison ¹⁰⁵	WYBE	—	—	300, 600	P G	N	—	United States of America
Colonel John V. White ¹⁰²	WYBK	—	Nicola's Mihanovich Company, Ltd., Buenos Aires	300, 600	P G	N	—	United States of America
Colonia LQD ¹	LQD	135	—	300, 600	P G	N	0.40	Argentine Republic
Colonia MCL ¹⁹	MCL	250	Western Reserve Navigation Co.	300, 450, 600	P	—	—	Great Britain
Colonial KDKR ¹⁴⁸	KDKR	150	—	300, 600	P G	X	0.10 119	United States of America
Colonial YSY ¹⁹	YSY	170	—	300, 600	P G	X	0.40	Great Britain
Colonian ¹⁹	GDO	210	—	300, 450, 600	P G	X	0.40	Great Britain
Colorado ⁹⁹	NECR	—	Navy	300, 600	P G	X	0.20 111	United States of America
Colorado Springs ¹⁰³	KILK	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40 112	United States of America
Colossus	GEEN	—	Navy	—	P G	—	—	Great Britain
Golfano ¹⁷	IZF	140	La Polare, Società di Navigazione, Genova	300, 600	P G	X	0.40	Italy
Coltraps ¹⁰³	KUMR	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	—	—	United States of America
Colúmba ¹⁷	IXH	140	Lloyd del Mediterraneo, Società di Navigazione, Rome	300, 600	P G	X	0.40	Italy
Columbia IWM ¹⁷	IWM	140	Cosulich Società Triestina di Navigazione, Trieste	300, 600	P G	N	0.40	Italy
Columbia MOI ³⁰	MOI	350	—	300, 450, 600	P G	N	0.40	Great Britain
Columbia NAXL ¹⁰²	NAXL	—	New Orleans and South American Steamship Company	300, 600	P G	N	—	United States of America
Columbia WHC ²	WHC	150	Pacific S.S. Co., Portland (Maine)	300, 450, 600	P G	X	0.20	United States of America
Columbia WIR	WIR	300	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	600, 750, 1,000	P G	N	—	United States of America
Columbine ²	NLL	250	Grace S.S. Co., Inc., 77, Hanover Square, New York (N.Y.)	300, 600	O	X	—	United States of America
Colusa ^{9 131}	WIN	300	Mallory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 600	P G	X	0.40	United States of America
Conal ¹⁰³	KEM	300	—	300, 600	P G	N	0.40	United States of America
Comanche ¹⁹	GCRQ	140	—	300, 600	P G	X	0.40	Great Britain
Comedian ¹⁹	ZWD	—	—	300, 600	P G	X	0.40	Great Britain
Cometic ¹⁹	GBTD	160	—	300, 600	P G	X	0.40	Great Britain

Shipboard Stations—Continued

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Year-Book of Wireless Telegraphy and Telephony

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres, the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Comet ⁹ 91	..	150	Standard Oil Co. of New York, Inc. corp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Cometa ¹	135	(Armateurs) Det Bergenske Dampskibsselskab, Bergen	300, 450, 600	P G ..	X	0.40	4.00	Norway
Comfort ⁹⁹	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Comino ¹⁹	—	—	300, 600	P G ..	X	0.40 ¹¹²	—	Great Britain
Commack ¹⁶³	300	—	300, 450, 600	P G ..	X	0.40	—	United States of America
Commanche KVC ¹⁸³	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Commanche NRW ²	100	Clyde S.S. Co., Pier 36, North River, New York (N.Y.)	300, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Commandant Bory	..	—	U.S. Coast Guard Treasury Dept., Washington (D.C.)	300, 800	P G ..	N	0.40 ¹¹²	—	France
Commandant Challes ¹	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Commandant Dorise ¹	—	Compagnie des Messageries Maritimes, Paris	—	P G ..	— ²⁷	0.40	—	France
Commandante Belham ¹⁵	..	75	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Commandant Lucas	..	—	Navy	300, 800	P G ..	N	0.05	—	France
Commandant Riviere	..	—	Navy	300, 800	P G ..	N	0.05	—	Brazil
Comandantubia ¹⁵	..	150	Companhia de Navegação Bahiana, São Salvador (Bahia)	300, 600	P G ..	N	0.40	—	Brazil
Commercial Pathfinder ¹²³	..	300	Osage S.S. Company	300, 600	P G ..	X	0.40	—	United States of America
Commewijne ¹	175	Koninklijke West Indische, Maildienst, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Commissaire Pierre Leococ ¹	..	300	Compagnie des Messageries Maritimes, Paris	300, 600	P G ..	—	0.40	—	France
Commissaire Ramel ¹	350	Compagnie des Messageries Maritimes, Paris	300, 600	P G ..	— ²⁷	0.40	—	France
Commissioner ⁸⁷	—	Merritt & Chapman, Derrick and Wrecking Co., 17, Battery Place, New York (N.Y.)	300, 600	P G ..	X	0.20	—	United States of America
Commodore BCG ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Commodore NLE ¹⁰²	..	—	—	300, 600	P G ..	X	—	—	United States of America
Commonwealth GCRS ¹⁹	..	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Commonwealth KXC ¹⁰³	..	75	New England S.S. Co., Fall River (Mass.)	300, 450, 550, 600	P G ..	N	0.40	—	United States of America

Shipboard Stations

Country	Company	Capital	Assets	Liabilities	Net Worth	Rating	Notes
Belgium	Armement Ocean (Société Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 600	300, 600	—	—	—	—
Great Britain	Navy Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 600	300, 600	—	—	—	—
United States of America	Hijos de J. Ramos, Barcelona	300, 600	300, 600	—	—	—	—
Spain	Mallory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 600	300, 600	—	—	—	—
Great Britain	Navy Colonial Navigation Co., Pier 39, North River, New York (N.Y.)	300, 550, 600	300, 600	—	—	—	—
United States of America	Concordia, Società Anonima di Navigazione, Genoa	300, 600	300, 600	—	—	—	—
Great Britain	Compañia General de Navegacion, Bilbao	300, 600	300, 600	—	—	—	—
France	Navy Compagnie Havraise Peninsulaire de Navigation à Vapeur	300, 800	300, 800	—	—	—	—
Spain	Compañia Naviera Vascongada, Bilbao	300, 600	300, 600	—	—	—	—
Spain	Sociedad Comercial Oriente, S. Sebastian	300, 600	300, 600	—	—	—	—
Chile	Navy Pimilos Izquierdo y Cia, Cadiz	300, 600	300, 600	—	—	—	—
Spain	Altos Hornos de Vizcaya, Bilbao (Armatures) Bjornstad & Braekhus, Bergen	300, 600	300, 600	—	—	—	—
Norway	Navy Vittoria, Società Anonima di Navigazione, Genoa	300, 800	300, 800	—	—	—	—
Germany	Navy	300, 600	300, 600	—	—	—	—
France	Navy	300, 600	300, 600	—	—	—	—
Italy	Navy	300, 600	300, 600	—	—	—	—
Great Britain	Navy	300, 600	300, 600	—	—	—	—
Portugal	Navy	300, 600	300, 600	—	—	—	—
Great Britain	Navy	300, 600	300, 600	—	—	—	—
United States of America	Gulf Refining Co., West 7th St., Port Arthur (Texas)	300, 600	300, 600	—	—	—	—
United States of America	Navy	300, 600	300, 600	—	—	—	—
United States of America	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	300, 450, 600	—	—	—	—
United States of America	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	300, 450, 600	—	—	—	—
United States of America	Navy	300, 600	300, 600	—	—	—	—
United States of America	U.S. Shipping Board, Washington (D.C.)	300, 600	300, 600	—	—	—	—
United States of America	Connersville	300, 600	300, 600	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Comness Peak ^{9 131}	..	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Conotton ¹⁴³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Conquérante	..	—	Navy	300, 800	P G	N	0.05	—	France
Conquérador	..	—	Navy	—	P G	—	—	—	Great Britain
Conquest	..	400	Navy	—	P G	—	—	—	Great Britain
Conrad Mohr ¹	..	—	(Armateurs) A/S Chr. Michelsen Bergen	300, 450, 600	P G	X	0.40	4.00	Norway
Consort ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Constance	..	—	Navy	—	P G	—	—	—	Great Britain
Constantin ⁷¹	..	150	Operated by M. Gimuchdjian, 33, King Street, London, S.W.1	300, 600	P G	X	0.40	—	Great Britain
Constantinople ¹⁹	..	—	Navy	300, 600	P G	X	0.40 ¹¹¹	—	Great Britain
Constellation ⁸⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹²	—	United States of America
Constitution ⁸⁰	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Consuelo ¹	..	—	Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Conte di Cavour	..	150	Ricardo Ortiz Artinano, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Conte Rosso ²¹	..	270	Navy	300, 600	P G	N	—	—	Italy
Contessa Adelmira ¹⁷	..	140	Lloyd Sabaudo, Società Anonima per Azioni, Genoa	300, 600	P G	X	0.40	—	Italy
Continental Bridge ^{9 111}	..	300	Lussino, Società Anonima di Navigazione a Vapore, Lussimpiccolo (D.C.)	300, 600	P G	X	0.40	—	United States of America
Controcock ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Contraeastre Casado	..	—	Navy	300, 450, 600	O	—	—	—	Spain
Conus ¹⁹	..	—	—	300, 600	P G	X	—	—	Great Britain
Convallaria ¹	..	250	Federaktiebolaget Actia, Helsingborg	300, 600	P	—	—	—	Sweden
Converse ¹⁰²	..	—	—	300, 600	P G	N	—	—	United States of America
Conway ¹⁹	..	180	—	300, 600	P G	N	—	—	Great Britain
Conyngnam ⁹⁸	..	—	Navy	300, 600	P G	N	0.40 ¹¹¹	—	United States of America

Coote GDLF ⁷¹	..	GDLF	200	Amalgamated Wireless (Australia), Ltd.	300, 450, 600	P G	..	1200 to 2500 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	Great Britain
Coeyanna ¹⁹	..	GBV	170	—	300, 600	P G	..	X	0.40	Great Britain
Cook NIGT ¹⁶²	..	NIGT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	—	United States of America
Cook KOFX ⁹⁹	..	KOFX	300	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G	..	X	0.40	Great Britain
Coolana ⁷¹	..	GFVM	—	—	300, 450, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	Australian Commonwealth
Coolana ¹	..	VZBP	300	—	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	Australian Commonwealth
Coolcha ⁹⁷	..	KOPS	—	Ocean Motor Company	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸	United States of America
Cooma ¹	..	VJE	250	—	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸	Australian Commonwealth
Coosa ¹⁰³	..	WLF	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	United States of America
Copalgrave ¹⁰³	..	KEFJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	N	0.40	United States of America
Copenhagen EXS ¹⁹	..	EXS	140	Aktieselskabet Det. Oversøiske Compagnie, Copenhagen	300, 600	P G	..	X	0.40	Great Britain
Copenhagen OYA ¹	..	OYA	250	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	..	X	— ³⁸	Denmark
Coparas ⁹⁷	..	WTEU	150	United Fruit S.S. Corporation	300, 600	P G	..	X	0.40	United States of America
Coppename ⁹⁸	..	KDF	350	—	300, 600	P G	..	N	0.40	United States of America
Coq (Le) ¹⁸	..	EYO	—	Navy	300, 600	P G	..	X	0.40	Great Britain
Coquelicot	..	FAIC	—	—	300, 800	P G	..	N	0.05	France
Coquetmade ¹⁹	..	BDE	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	Great Britain
Coquina ⁹ ¹³¹	..	WVAA	150	—	300, 600	P G	..	X	0.40	United States of America
Coquitt ¹⁰⁸	..	KOFZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Cora F. Cressy ⁹ ¹³¹	..	KSZ	200	A. W. Frost	300, 600	P G	..	X	0.40	United States of America
Corapeak ⁹ ¹³¹	..	WVAE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Corazziere	..	IIK	—	Navy	—	P G	..	—	—	Italy
Corbank ¹⁹	..	BAA	110	—	300, 600	P G	..	X	0.10 ⁸⁷	Great Britain
Corbis ¹⁹	..	OFL	130	—	300, 450, 600	P G	..	X	0.40	Great Britain
Corbrae ¹⁹	..	MYT	130	—	300, 600	P G	..	X	0.10 ⁸⁷	Great Britain
Corby ¹⁹	..	BDD	145	—	300, 600	P G	..	X	0.40	Great Britain
Corcliff ¹⁹	..	ZDY	—	—	300, 600	P G	..	X	0.10 ⁸⁷	Great Britain
Corcovo	..	PPF	200	Companhia Comercio E. Navegação, Rio de Janeiro	300, 500, 600	P G	..	N	0.40	Brazil

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles	Shipping Line or Ship Owner.	Wavelengths in Metres Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Corcové ¹⁹	ZBC	115	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Corcorag ¹⁹	ZAT	—	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Corcorat ¹⁹	BBV	130	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Cordale ¹⁹	GDFW	—	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Cordelia GEFX	GEFX	—	Navy	—	PG	—	—	—	Great Britain
Cordelia MXM	MXM	170	—	300, 600	PG	X	0.40	—	Great Britain
Cordillera ¹⁹	GDKK	—	—	300, 600	PG	X	0.40	—	Great Britain
Cordillier ¹⁹	FMR	300	—	300, 600	PG	—	0.04	—	France
Cordoba LLB ¹	LLB	—	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	450, 600	O	N	—	—	Argentine Republic
Cordoba UDL ¹	UDL	350	—	300, 600	PG	N	0.40	—	France
Cordobes (El) ¹⁹	MHO	250	—	300, 600	PG	X	0.40	—	Great Britain
Cordova ⁹⁷	WAR	100	—	300, 550, 600	PG	X	0.20	—	United States of America
Corte Castle ¹⁹	ERE	—	Alaska S.S. Co.	300, 600	PG	N	0.40	—	Great Britain
Corfoll ¹⁹	ZBZ	145	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Corfoll ¹⁹	BKM	150	—	300, 600	PG	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Coria ¹	TMN	150	Naviera Sevillana, S.A., Sevilla	300, 600	PG	N	0.30	3.00	Spain
Corilla ²	WPIA	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	—	United States of America
Corinthie ¹⁹	MWT	230	—	300, 450, 600, 2,100, 2,200, 2,400	PG	X	0.40	—	Great Britain
Corio ³	VXO	300	—	300, 600	PG	—	0.30 ⁸ 0.40 ¹⁰	—	Australian Commonwealth
Corland ¹⁹	GFCT	120	—	300, 600	PG	9930 to 1030	—	—	—
Corlech ¹⁹	YTS	135	—	300, 600	PG	1200 to 1300	—	—	—
Cornoran ¹	UKX	150	—	300, 600	PG	1400 to 1430	—	—	—
Cornorant BTZ ¹⁹	BTZ	110	Société Industrielle Nationale de Peché et d'Armement, Dieppe	300, 600	PG	1030 to 1730	—	—	—
Cornorant MFJ ²¹	MFJ	140	Cork Steamship Co., Ltd.	300, 600	P	2030 to 0030 (ship's time)	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Cornorant NIKV ⁸⁰	NIKV	—	Western Telegraph Co., Ltd.	300, 600	P	—	0.40	—	France
Cornorant NIKV ⁸⁰	NIKV	—	Navy	300, 600	PG	—	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
					PG	—	—	—	United States of America

Cornelle ¹ Cornella ¹⁰⁰	—	FWC KZD	Delmas Frères, La Rochelle Bull. Insular S.S. Co., 17, Battery Place, New York (N.Y.)	—	P G	X	0.40	—	France United States of America
Cornelle Cornelis	100	FAIL TYC	Navy A. C. Lensen's Stoornvaart Maats- chappij, Terneuzen	600, 800 300, 600	P G	X	0.05 0.40	4.00	France Holland
Cornelis Drebhel ¹ Cornflower Corning ^{9 131}	— 300	PAY GEZJ KIH	Navy Standard Oil Co. of New Jersey, Incorp., 26, Broadway, New York (N.Y.)	300 300, 450, 600	O 4 P G	— X	— 0.40	—	Holland Great Britain United States of America
Cornish City ¹⁹ Cornishman ¹⁹ Cornish Point ¹⁹	150 230 180	YHR GDW ZPE	—	300, 600 300, 600 300, 600	P G P G P G	X X X	0.40 0.40 0.40	—	Great Britain Great Britain Great Britain
Cornouaille ¹ Cornuocopia ¹⁰³	200 200	FZL WNIU	Chevillotte Frères, Brest U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	X X	0.40 0.40	—	France United States of America
Cornwall ¹⁹ Cornwood ¹⁹	—	GDQM GFCJ	—	300, 600 300, 600	P G P G	X X	0.15 ⁸² 0.15 ⁸²	1.50 ⁸²	Great Britain Great Britain
Corona NNQ ⁹⁹	—	NNQ	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Corona OJW Corona TQF ¹	200 100-150	OJW TQF	Meritoni O.T. Abo (Armateurs) H. M. Wrangell & Co., A/S Haugesund	300, 600 300, 600	P G P G	X X	0.15 0.40	0.75 4.00	Finland Norway
Corona VEB ²¹	100	VEB	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	— ²⁷	0.40	—	Canada
Coronado GBC ¹⁰	190	GBC	—	300, 600, 2,100, 2,200 C.W.	P G	X	0.40	—	Great Britain
Coronado WIZ ^{9 131}	200	WFZ	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Coronaido ¹⁰ Corpath ¹⁰² Corrales ⁹⁷	— — 150	GFDJ GDJR WPJE	— — U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600 300, 600	P G P G P G	X X X	0.40 0.10 ⁸⁷ 0.10	1.00 ⁸⁷	Great Britain Great Britain United States of America
Corrientes LLI ¹ Corrientes GDMP ¹⁰ Corry ¹⁰² Coursir ²	— — — —	LLI GDMP NUOZ KYC	Navy — — Yacht belonging to J. P. Morgan, 23, Wall St., New York (N.Y.)	300, 450 300, 600 300, 450, 600	O P G P G	N X N	— 0.40 0.20 ¹¹¹	—	Argentine Republic Great Britain United States of America
Corsica ¹⁰ Corsica ^{1 57}	— 300	GFVQ FRC	Fraissinet & Cie. (Compagnie Mar- seille de Navigation à Vapeur), Marseille	300, 450, 600 300, 600	P G P G	X X	0.40 ¹¹² 0.10 ⁸² 0.10	1.00 ⁸²	Great Britain France
Corsican MCN ⁵⁰ Corsicana ^{9 131}	240 300	MCN WPHI	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	N X	0.40 0.40	—	Great Britain United States of America
Corson ^{9 131}	300	KIQV	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Corstar ¹⁰ Corstream ¹⁰	100 —	EXT GCXW	—	300, 600 300, 600	P G P G	X X	0.05 ⁸⁷ 0.10 ⁸⁷	0.50 ⁸⁷ 1.00 ⁸⁷	Great Britain Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radio-telegram.	
Corte II ¹⁷	FRT	200	Fraissinet & Cie, (Compagnie Française de Navigation à Vapeur), Marseilles	300, 600	P G	X	0.10	—	France
Cortelazzo IAD ¹⁷	IAD	140	Del Pino Emilio, Leghorn	300, 800	P G	X	0.40	—	Italy
Cortezazo IGY	IGY	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Cortes ¹⁸	GBXD	—	—	—	—	—	—	—	Germany
Cortoni ¹⁹	BMO	145	—	300, 600	P G	X	0.05 ⁸⁷	0.50 ⁸⁷	United States of America
Cortona ¹⁹	GFDp	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Coruna (La) ²⁵	DCU	200	—	300, 450, 600	P G	N	0.40	4.00	Germany
Corvus ⁹ 151	KOPL	300	Green Star S.S. Corporation, 120, Broadway, N.Y.	300, 450, 600	P G	X	0.20	—	United States of America
Corwen ¹⁹	EVI	140	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Coskata ⁹⁷	KOMZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Cosme y Jacinta ²	TIT	500	Echevarreta Larinaga, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Costantinopoli ¹⁷	IOQ	190	Società Italiana di Servizi Marittimi, Rome	300, 600	P G	X	0.40	—	Italy
Costa Rica ²	WQI	300	L. A. Pederson, 112, Market St., San Francisco (Cal.)	300, 600	P G	X	0.20	—	United States of America
Costigan ⁹⁷	KINF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Costilla ¹⁰³	WMEA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cotati ¹⁰⁹	KIQF	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cote Blanche ⁹⁷	WMEE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cote Nord ²⁴	XWZ	100	J. Landry, Esquimaux Point (P.Q.)	300, 600	P	— ⁸⁷	0.20	—	Canada
Cotopaxi ⁹ 151	WMEI	150	Clinchfield Navigation Company, 24, Broad Street (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Cottonwood ⁹⁷	WMEU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cottonplant ⁹⁷	WMEO	200	Pacific States Lumber Co.	300, 600	P G	X	0.40	—	United States of America
Coucy FBCY	FBCY	—	Navy	300, 800	P G	N	0.05	—	France

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County of Carmarthen ¹⁹	YVN	100	Navy	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	Great Britain
Courageux GEDK	GEDK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	Great Britain
Courageux WVUA ¹⁰³	WVUA	—	Navy	300, 600	P G	—	—	—	United States of America
Courageux ⁶¹	FBLZ	150	Société Anonyme les Chalutiers de La Rochelle, Bastion St. Nicholas, La Rochelle	300, 800	P G	—	—	—	France
Courbeau	UTO	—	Navy	300, 450, 600	P G	—	—	—	France
Courbet	FACO	—	Navy	300, 800	P G	—	—	—	France
Courtois ^{9 131}	WVOI	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	United States of America
Courtown ¹⁹	LUS'	115	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	Great Britain
Coushatta ¹⁰³	WVOO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	United States of America
Coutouenc ¹⁰³	WVOU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	United States of America
Covale ^{9 131}	KEMM	200	Morton Salt	300, 600	P G	—	—	—	United States of America
Covdale ^{9 131}	KEMN	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	—	—	—	United States of America
Covina ^{9 131}	KEMP	200	Hammond Lumber Co.	300, 450, 600	P G	—	—	—	United States of America
Coventry	GEFY	—	Navy	300, 450, 600	P G	—	—	—	Great Britain
Covern ^{9 131}	KENM	200	Fred J. Gauntlett	300, 600	P G	—	—	—	United States of America
Cowanshannock ⁹⁷	WMAE	200	Bethlehem Shipbuilding Corp.	300, 600	P G	—	—	—	United States of America
Cowee ¹⁰³	WMAO	200	Fred J. Gauntlett	300, 600	P G	—	—	—	United States of America
Cowiche ⁹⁷	WXOA	200	California & Oregon Lumber Co.	300, 450, 600	P G	—	—	—	United States of America
Cowell ⁹⁹	NETV	—	Navy	300, 600	P G	—	—	—	United States of America
Cowrie ¹⁹	ZMW	175	—	300, 600	P G	—	—	—	Great Britain
Coya ¹⁹	GXH	180	—	300, 600	P G	—	—	—	Great Britain
Crabe FABJ	FABJ	—	Navy	300, 800	P G	—	—	—	France
Crable UJM ¹	UJM	150	Boucllet Fils, Zenequin, Canu & Mer (Armateurs), Boulogne-sur-Mer	300, 600	P G	—	—	—	France
Cracovia ¹⁷	UQR	190	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	300, 600	P G	—	—	—	Italy
Craftsman KIBR ²	KIBR	—	M. J. Dady Engineering and Contracting Co.	300, 600	P G	—	—	—	United States of America
Craftsman MHV ¹⁹	MHV	—	—	300, 600	P G	—	—	—	Great Britain
Cragness ¹⁹	GBQL	—	—	300, 450, 600	P G	—	—	—	Great Britain
Craigsmere ⁹⁷	WXOO	300	Morton Salt Co.	300, 450, 600	P G	—	—	—	United States of America
Crauncreek ^{9 131}	WNAA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	United States of America
Crumpton Anderson ^{9 131}	KDOH	—	Pan-American Petroleum and Transport Co., Incorp., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	—	—	—	United States of America
Crane NFB ⁹⁹	NIFB	—	Navy	300, 600	P G	—	—	—	United States of America
Crane YDP ⁷¹	YDP	—	General Steam Navigation Co., Ltd.	300, 600	P G	—	—	—	United States of America
Craunest ¹⁰³	WNAE	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	—	—	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Cranfield ¹⁹	CEQS	—	—	300, 600	P G	X	0.40	—	Great Britain
Cranford GDST ¹⁰⁸	GDST	—	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Cranford KOLX	KOLX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cranley ¹⁰	YSP	175	—	300, 600	P G	X	0.40	—	Great Britain
Cranstone ⁵⁰	GDJ	100	—	300, 450, 600	P G	X	0.40	—	Great Britain
Craonne	FAON	—	Navy	300, 600	P G	X	0.05	—	France
Craonne II ¹¹	FDZ	—	Puech Filis, Cette	—	P G	X	0.40	—	France
Craster Hall ¹³¹	KLK	150	U.S. Steel Products Company, 30, Church St. (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Crathorne ¹⁰³	WSOO	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Craycroft ⁸⁷	WNAI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Craven ⁹⁹	NERJ	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Crawford Castle ¹⁹	BGO	—	—	300, 600	P G	X	0.40	—	United States of America
Crawley Keys ¹³¹	WDEI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Crenatula ¹⁹	OPG	120	—	300, 600	P G	X	0.40	—	Great Britain
Crenella ¹⁹	YPK	170	—	300, 600	P G	X	0.40	—	Great Britain
Cresle ¹	KKR	300	—	300, 600	P G	X	0.40	—	United States of America
Cretan ¹³¹	KQC	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
Cretic ¹⁹	MRC	170	Merchants and Miners' Transportation Co.	300, 600	P G	N	0.40	—	Great Britain
Creusot	FAOG	—	—	300, 600	P G	N	0.05	—	France
Crewe Hall ¹⁹	ELJ	150	Navy	300, 600	P G	X	0.40	—	Great Britain
Crocket GFOP	GFOP	—	Navy	—	P G	X	0.20 ¹¹¹	—	Great Britain
Crocket WSEI ⁸⁷	WSEI	200	Fred Linderman	300, 450, 600	P G	X	0.40 ¹¹²	—	United States of America
Crimée ¹	FMK	400	Compagnie des Messageries Maritimes, Paris	300, 600	P G	— ⁸⁷	0.40	—	France
Cripple Creek ⁹⁷	KOJL	200	U.S. Shipping Board, Washington (D.C.)	300, 376, 600	P G	X	0.40	—	United States of America
Crisfield ¹⁰³	KOKP	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cristina KUZB	KUZB	150	Vincent Astor	300, 450, 600	P G	X	0.20	—	United States of America

Shipboard Stations

125

United States of America

0.20

N

P G

300, 600

Company Transatlantica, Barcelona

930

TOC

Cristobal Colon

Cristobal Colon	930	Company Transatlantica, Barcelona	300, 600	P G	N	0.30	3.00	Spain	United States of America
Cristobal Lusa	100	Vuda de Lusa y R. Masia, Barcelona	300, 600	P G	N	0.30	3.00	Spain	
Criti	100-150	The Hellenic Company of Maritime Enterprises, Piraeus	300, 600	P G	X	0.40	4.00	Greece	
Crocus	—	Navy Steel Products Company, 30, Church St. (N.Y.)	300, 450, 600	P G	N	0.40	—	Great Britain	
Crofton Hall	300	Great Eastern Railway Co.	300, 450, 600	P G	N	0.40	—	United States of America	
Cromer	—	U.S. Signal Corps, War Dept., Washington (D.C.)	300, 450, 600	P G	N	0.40	1.00 ⁸⁷	Great Britain	
Cronshagen	200	—	300, 600	P G	9900 to 1200	0.40	4.00	Germany	
Cronstadt	145	—	300, 600	P G	X	0.40	—	Great Britain	
Crook	500	—	300, 600	P G	X	0.20 111	—	United States of America	
Crosby	—	—	300, 600	P G	N	0.40 112	—	United States of America	
Crosby Hall	125	—	300, 600	P G	N	0.20 111	—	United States of America	
C. Rossard	—	—	300, 600	P G	X	0.40 112	—	Great Britain	
Crosse (La)	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 700	P G	X	0.40	—	Italy	
Crosshill	180	—	300, 600	P G	X	0.40	—	United States of America	
Cross Keys	300	—	300, 600	P G	X	0.40	—	United States of America	
Crossway	—	—	300, 600	P G	X	0.40	—	Great Britain	
Crown City	300	—	300, 450, 600	P G	X	0.40	—	United States of America	
Crownshield	—	—	300, 600	P G	N	0.20 111	—	United States of America	
Croxteith Hall	—	—	300, 600	P G	X	0.40 112	—	United States of America	
Grozier	—	—	300, 600	P G	X	0.40	—	Great Britain	
Crudoil	—	—	300, 600	P G	X	—	—	Great Britain	
Cruyssen	250	—	300, 600	P G	X	0.40	—	United States of America	
Crysantherum	—	—	300, 600	P G	0600 to 0800	0.40	4.00	Holland	
Cuba KDLK	—	—	300, 450, 600	P G	0900 to 1200	—	—	Great Britain	
Cuba KDRT	150	—	300, 450, 600	P G	1400 to 1800	0.20 111	—	United States of America	
Cuba PWI	—	—	300, 450, 600	P G	2000 to 2200	0.40 112	—	United States of America	
Cuba WQU	300	—	300, 600	P G	N	0.40 112	—	Guba	
Cuba WYCA	—	—	300, 600	P G	N	—	—	United States of America	
Cubano	175-200	—	300, 600	P G	N	—	—	United States of America	
Cubore	300	—	300, 450, 600	P G	X	0.40	—	United States of America	
Culf	180	—	300, 600	P G	X	0.40	—	Great Britain	
Culherson	300	—	300, 600, 1,800	P G	X	0.40	—	United States of America	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Culburra ²	..	300	Ocean Motor Co. ..	300, 450, 600	P G	X	0.20	—	United States of America
Culgoa ¹⁸	..	—	Navy ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Culha ¹⁹	..	190	..	300, 600	P G	X	0.40	—	Great Britain
Cumberland NSZ ⁹⁹	..	—	Navy ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Cumberland GDWC ¹⁹	..	—	..	300, 450, 600	P G	X	0.40	—	Great Britain
Cunings ⁹⁹	..	—	Navy ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Cunene ⁴¹	..	100-150	..	300, 600	P G	N	0.40	4.00	Portugal
Cunfida	..	—	Navy ..	300, 600	P G	X	0.40	—	Italy
Cuprum	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Curacao ¹⁹	..	200	Pacific Coast Co., 10 Wall St., New York (N.Y.)	300, 600	P G	N	0.40	—	United States of America
Curacao	..	150	Navy ..	300, 600	P G	N	0.40	—	United States of America
Curie	..	—	Navy ..	300, 800	P G	N	—	—	Great Britain
Curieuse	..	—	Navy ..	300, 800	P G	N	0.05	—	France
Curitiba ¹⁵	..	150	Lage & Irmaos, Rio de Janeiro	300, 600	P G	N	0.05	—	Brazil
Curlew GEJB	..	—	Navy ..	300, 600	P G	N	0.40	—	Great Britain
Curlew NIJB ^{9 331}	..	—	Navy ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Curraghmore ⁷¹	..	150	London & North-Western Railway Company	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	1.00 ⁸⁷	Great Britain
Currier ¹³⁹	..	300	Gulf Refining Co., West 7th St., Port Arthur (Texas)	300, 450, 600	P G	X	0.10 ⁸⁷	—	United States of America
Curvello ²	..	400	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Cushing NIM ⁹⁹	..	—	Navy ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	4.00	United States of America
Cushnet ⁹⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Cushnoc ^{9 133}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Custodian GCE ¹⁹	..	220	Pringle Bargeline Co. ..	300, 600	P G	X	0.40	—	Great Britain
Custodian KIVZ ¹²³	..	—	..	300, 600	P G	N	0.40	—	United States of America
Cutcombe ¹⁹	..	—	..	300, 600	P G	X	0.40	—	United States of America
Cuthbert ¹⁹	..	155	..	300, 600	P G	X	0.40	—	Great Britain
Eastbourne ⁹⁵	..	—	U.S. Shipping Board, Washington	300, 600	P G	N	0.40	—	United States of America

Shipboard Stations

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Cuyaba	SSN	400	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	Brazil
Cuyama	NOD	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Cuyamaca ^{9 121}	KUXD	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Cuzco ¹⁷	IZS	140	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	Italy
Cyan ¹⁰³	NIFV	—	Navy	300, 600	P G	N	—	United States of America
Cyclamen	GKEC	—	—	300, 600	P G	—	0.30 ⁸ 0.40 ⁹	Great Britain
Cycle ³	VZBX	120	—	300, 600	P G	—	—	Australian Commonwealth
Cyclone ¹	UKW	150	Maurice Bernard (Armateur), Boulogne-sur-Mer	300, 600	P G	X	0.40	France
Cyclone FKZ ¹	FKZ	180	Service de Sauvetage à l'Embouchure de la Grande, 22, Quai de Bacalan, Bordeaux	300, 600	P G	N	0.40	France
Cyclope	FACY	—	Navy	300, 800	P G	N	0.05	France
Cyclops GFUK	GFUK	—	A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	—	Great Britain
Cyclops GTF ⁷¹	GTF	90	—	300, 600	P G	X	0.40	Great Britain
Cygan ¹⁰²	NICP	—	Operated by the Anglo-Belgique Shipping Co., Ltd., Imperial Buildings, Mount Stuart Sq., Cardiff	300, 450, 600	P G	X	0.10 ⁸²	United States of America
Cygnat ¹⁹	GFVT	—	—	300, 600	P G	X	0.40	Great Britain
Cymric Pride ⁷¹	BJQ	—	—	300, 600	P G	X	—	Great Britain
Cymric Queen ¹⁹	BCZ	—	—	300, 450, 600	P G	X	0.40	Great Britain
Cymric Vale ¹⁹	LUG	145	—	300, 600	P G	X	0.40	Great Britain
Cynthia ¹⁹	GFWM	—	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	600, 450, 600	P G	X	0.40	United States of America
Cypress ²	NLM	250	—	600, 750, 1,000	O	X	—	Great Britain
Cypria ¹⁹	ZZL	180	—	300, 600	P G	X	0.40	United States of America
Cyprian Prince ¹⁹	GCMT	170	—	300, 600	P G	X	0.40	Great Britain
Cyrus W. Field ²	WYBC	130	U.S. Signal Corps, War Dept., Washington (D.C.)	600	O	X	—	United States of America
D.1 ⁹⁹	NXP	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
D.2 ⁹⁹	NXQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
D.3 ⁹⁹	NXR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
D.10 ¹	ADQ	—	Navy	—	O	N	0.40 ¹¹²	United States of America
D'Aosta ¹⁷	IZB	140	La Polare Società di Navigazione, Genoa	300, 600	P G	N	0.40 ¹¹²	Germany
Dacia	CVD	240	Marine Department of the Roumanian Government	600	P G	X	0.40	Italy
Dacre Castle ¹⁹	MTQ	—	—	300, 600	P G	N	0.30	Roumania
Dacre Hill ¹⁹	GDNK	150	—	300, 600	P G	X	0.40	Great Britain
Dade County ^{9 131}	KIJZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Daffodil	P G	—	—	—	Great Britain
Dagali ¹	150-175	Navy (Armateurs) John P. Pedersen & Son, Christiania	300, 600	P G	X	0.40	4.00	Norway
Dageid ¹	100-150	(Armateurs) John P. Pedersen & Son, Christiania	300, 600	P G	X	0.40	4.00	Norway
Dagenham ¹⁰	(Armateurs) John P. Pedersen & Son, Christiania	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Daglin ¹	150-175	(Armateurs) John P. Pedersen & Son, Christiania	300, 600	P G	X	0.40	4.00	Norway
Dagfred ¹	200-250	(Armateurs) John C. Pedersen & Son, Christiania	300, 600	P G	X	0.40	4.00	Norway
Daghestan ⁵⁰	350	—	300, 450, 600	P G	X	0.40	—	Great Britain
Daghild ¹	150-250	(Armateurs) John P. Pedersen & Son, Christiania	300, 600	P G	X	0.40	4.00	Norway
Dagmar ⁴⁰	350	Aktieselskabet det Forenede Dampskibs-Selskab, Copenhagen	300, 450, 600	P G	X	0.40	4.00	Denmark
Dagmar KCJ ¹	150	Russian-Baltic Steamship Company, Riga	300, 450, 600	P G	X	0.15 ⁴³	—	Lettonia
Dago ¹⁹	—	Navy	300, 600	P G	X	0.15 ⁸³	1.50 ⁸³	Great Britain
Dahlgren ⁹⁹	—	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	N	0.20 ¹¹¹	0.40 ¹¹³	United States of America
Dahomey ¹	300	—	300, 450, 600	P G	X	0.40	—	France
Dainichi Maru ¹	400	Itaya Shosen Kaisha	300, 600	P G	..	0.40	—	Japan
Dakatieh ¹⁹	—	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 450, 600	P G	..	0.40	—	Great Britain
Dakar Maru ¹	400	—	300, 600	P G	X	0.40	—	Japan
Dakarlan ¹⁹	—	A. H. Bull S.S. Co., 17, Battery Place, New York	300, 600	P G	..	0.40	—	Great Britain
Dakotan ¹³⁴	300	—	300, 450, 600	P G	..	0.40	—	United States of America
Dakotian ¹⁹	—	—	300, 600	P G	X	0.40	—	Great Britain
Dale ⁹⁹	—	—	300, 600	P G	N	—	—	United States of America
Dalemead ¹⁶	—	—	300, 600	P G	X	0.40	—	Great Britain
Dalemoor ¹⁹	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Dalewood ¹⁹	—	—	300, 450, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Dalgoma ¹⁹	—	—	300, 450, 600	P G	X	0.40	—	Great Britain

Line	Company	Class	Port	Country	Flag	Capacity	Speed	Remarks
1	Dalhousie City	VEA	100	Niagara & St. Catharines' Nav. Co., Ltd., Toronto, Ont.	PG	300, 600	—	Canada
2	Dallas KEQB	KEQB	300	U.S. Shipping Board, Washington (D.C.)	PG	300, 450, 600	—	United States of America
3	Dallas NENM	NENM	—	Navy	PG	300, 600	—	United States of America
4	Dallington	ODE	115	Lloyd Triestino, Società di Navigazione à Vapore, Trieste	PG	300, 600	0.20 ¹¹¹	Great Britain
5	Dalmatia	ILH	140	Navy	PG	300, 600	0.40 ¹¹²	Italy
6	Dalmazia IFL	IFL	—	La Veloce, Società di Navigazione, Rome	PG	300, 600	—	Italy
7	Dalmazia UQK	UQK	190	Compagnie des Chargeurs Réunis, Paris	PG	300, 600	—	France
8	Dalry	UFH	180	U.S. Shipping Board, Washington (D.C.)	PG	300, 600	—	United States of America
9	Dalworth	GDCM	—	Società Anonyme les Chalutiers de la Rochelle, La Rochelle	PG	300, 600	—	France
10	Damacan	KELS	—	(Armateurs) Rederiaktieselskabet Damp, Christiania	PG	300, 600	—	Norway
11	Damier	FBZ	180	(Armateurs) Rederiaktieselskabet Damp, Christiania	PG	300, 600	—	Norway
12	Dampen	AVL	125	Ship engaged in the International Exploration of the Sea	P	300, 600	— ³⁸	Denmark
13	Dampfo	AVM	125	Società Veneziana di Navigazione Vapore, Venice	PG	300, 600	—	Italy
14	Dana	OXQ	100	Operated by the Falmouth Docks and Engineering Co., Falmouth	PG	300, 600	—	Great Britain
15	Dandolo	USD	140	Navy	PG	300, 600	0.10 ⁸²	Italy
16	Dandy	GCTN	—	Transatlantica Italiana Società di Navigazione, Rome	PG	300, 450, 600	—	Italy
17	Dante Alighieri IHC	IHC	—	Rederiet Suenson & Jespersen, Copenhagen	PG	300, 450, 600	—	Denmark
18	Dante Alighieri IUH	IUH	270	Aktieselskabet Rederiet Quarto, Copenhagen	PG	300, 450, 600	—	Denmark
19	Danebod	OGN	200	Rederiet Suenson & Jespersen, Copenhagen	PG	300, 450, 600	—	Denmark
20	Danebrog OGQ	OGQ	200	Rederiet Suenson & Jespersen, Copenhagen	PG	300, 450, 600	—	Denmark
21	Danemark	OHV	200	D. J. Hanlon, Alameda (Cal.)	PG	300, 450, 600	—	United States of America
22	Dan F. Haulou	KDKU	—	Aktieselskabet Det Forenede Dampskibsselskab, Copenhagen	PG	300, 450, 600	—	Denmark
23	Danfa	OGS	200	Independent Towing Company	PG	300, 450, 600	—	United States of America
24	Daniel Kern	KDXG	150	U.S. Shipping Board, Washington (D.C.)	PG	300, 450, 600	—	United States of America
25	Daniel Webster	KOKM	300	Navy	PG	300, 600	—	United States of America
26	Danier	GCNZ	—	U.S. Shipping Board, Washington (D.C.)	PG	300, 600	—	Great Britain
27	Dannebrog	ODU	—	Transports Maritimes de l'Etat	PG	300, 450, 600	—	Denmark
28	Dannebrog	KOPD	300	Navy	PG	300, 600	—	United States of America
29	Dannemarie	HRI	200	Aktieselskabet Dampskibsselskabet	PG	300, 600	—	France
30	Dauoe	GEJC	—	Dannebrog, Copenhagen	PG	300, 450, 600	—	Great Britain
31	Dausborg	OHLA	350	Compagnie des Messageries Maritimes, Paris	PG	300, 450, 600	—	Denmark
32	Danube FID	FID	400	Navy	PG	300, 600	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Danubier ¹⁰	ORN	100-150	Lloyd Royal Belge	300, 600	P G	X	0.40	4.00	Belgium
Danville ¹⁰ ¹³¹	KOST	300	U.S. Shipping Board	300, 450, 600	P G	X	0.40	4.00	United States of America
Danzig ¹	DTD	200	Artus Danziger Reederei- und Handels Aktiengesellschaft, Danzig	300, 600	P G	X	0.40	4.00	Danzig
Daphn ² FAPN	FAPN	—	Navy	300, 800	P G	N	0.05	—	France
Daphne TGA ¹	TGA	150-200	The Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G	X	0.40	4.00	Greece
Daphne SWQS ¹	SWQS	100-150	N. D. Lyciardiapoulos, Piræus	300, 600	P G	X	0.40	4.00	Greece
Daphni	SYX	—	Navy	—	O	N	—	—	Greece
Dara ¹⁵	VUQ	200	Bombay & Persia Steam Navigation Co., Ltd.	300, 600	P G	N	0.40	—	India
Dardania ¹⁷	USE	140	Tripcovich D., Trieste	300, 600	P G	X	0.40	—	Italy
Dardanus ¹	PEV	150	De Nederlandsche "Stoomvaart Maatschappij Océaan, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Darden ¹⁰³	KUPK	—	U.S. Mex Oil Corporation, 26, Beaver St., New York (N.Y.)	300, 600	P G	N	0.20	—	United States of America
Darian ¹⁹	GCJX	—	Panama Canal	300, 450, 600	P G	X	0.40	—	Great Britain
Darien ⁹⁷	KULG	300	—	300, 600	P G	X	0.40	—	United States of America
Darnholme ¹	YLD	150	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Darro ¹⁰ ⁸⁹	GCRV	260	—	300, 600, 2,100, 2,200 c.w.	P G	N	0.40	—	Great Britain
Dartford ⁹⁷	KDAV	—	U.S. Mex Oil Corporation, 26, Beaver St., New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Dartmouth	GEJD	—	Navy	—	P G	X	—	—	Great Britain
Datchet ¹⁵	EWH	140	—	300, 600	P G	X	0.40	—	Great Britain
Datura	FAPJ	—	Navy	600, 800	P G	N	0.05	—	France
Dauntless	GEJF	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Daupherat ¹³¹	KIZJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Dauphin ¹	FOZ	180	Ballias & Mahé, Lorient	300, 600	P G	X	0.40	—	France
Davenport ⁹⁷	KUDR	300	U.S. Shipping Board	300, 600	P G	X	0.20	—	United States of America
David Lloyd George ¹⁰	EOS	200	—	300, 600	P G	X	0.40	—	Great Britain
David McKelvy	KDID	300	Tidewater Oil Company	300, 600	P G	X	0.40	—	United States of America
Davidson County ¹³¹	KINX	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America

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Ship	Call	Frequency	Power	Operator	Country	Notes
Davo ¹⁹	BET	Great Britain	
Dawn	KDZH	..	..	..	United States of America	
Dawnlite ^{9 131}	KPP	150	300, 450, 600	William T. Donnelly Standard Oil Co. of New Jersey Incorp., 26, Broadway, New York (N.Y.)	United States of America	
Daybeam ⁷¹	GCYP	..	300, 450, 600	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	Great Britain	
Daybreak ⁷¹	GCYQ	..	300, 450, 600	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	Great Britain	
Daylite ^{9 131}	KPR	150	300, 450, 600	Standard Oil Co. of New Jersey, Incorp.	United States of America	
Dayton ⁵⁰	GJCO	100	300, 450, 600	Pan-American Petroleum & Transport Co., Inc., 1015, Security Building, Los Angeles (Cal.)	Great Britain	
Dean Emery ^{9 131}	KOFQ	300	300, 450, 600	W. G. Coyle & Company	United States of America	
De Bardeleben ^{9 131}	KIZD	200	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	
Decatur ⁹⁷	RBX	250-300	300, 600	..	Russia	
Decatur Bridge ⁹⁷	KECJ	300	300, 450, 600	..	United States of America	
Decatur NJC ¹⁰²	NJC	..	300, 600	..	United States of America	
Decatur NUQV ¹⁰²	NUQV	..	300, 600	..	United States of America	
Deidat	FBGD	..	300, 800	Navy	United States of America	
Deidaigneuse	FBDN	..	300, 800	Navy	France	
Dédalo	EHU	..	..	Navy	Spain	
Dee	GRUS	..	..	Navy	Great Britain	
Deenster ¹⁹	YFR	..	..	..	Great Britain	
Deepwater ^{9 131}	KLY	300	300, 450, 600	Castner Curran & Bullitt, Incorp.	United States of America	
Deerfield ⁹⁷	WTIU	300	300, 450, 600	Elder Steel S.S. Co., New York	United States of America	
Deer Lodge ⁹⁷	KIMD	300	300, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	
Deerwood ¹⁹	XLK	..	300, 600	..	Great Britain	
Defender ¹⁹	YTE	230	300, 600	..	Great Britain	
Defiance ¹⁰³	WSEA	..	300, 600	..	United States of America	
De Greve ¹	PMF	200	300, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	
Dehorter	FBDH	..	300, 800	Koninklijke Paketvaart Maatschappij, Amsterdam	Dutch East Indies	
Deiva ¹⁷	UPC	140	300, 600	Navy	France	
De Klerk	AOF	200	300, 600	Esercizio Bacini, Genoa	Italy	
Delage	FAXJ	..	600, 800	Koninklijke Paketvaart Maatschappij, Amsterdam	Dutch East Indies	
Delagoa ⁴⁰	OGVA	250	300, 450, 600, 800	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	Denmark	
Delagoa Maru ¹	JDI	400	300, 600	Nippon Yusen Kaisha (Japan Mail Steamship Company)	Japan	
Delambre ¹⁹	BHC	..	300, 600	..	Great Britain	
Delanson ^{9 131}	KOTX	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	
De La Salle ¹	FTW	250	300, 600	Compagnie Générale Transatlantique, Paris	France	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Delavan ¹⁰³	KIRQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Delaware GCRW ¹⁹	GCRW	200	Navy	300, 600	P G	X	0.40	—	Great Britain
Delaware NEK ⁹⁹	NEK	—	—	300, 600	P G	X	0.20 ¹¹¹	—	United States of America
Delaware Sun ^{9 131}	KDWQ	300	Sun Company, Finance Building, Philadelphia (Pa.)	300, 450, 600	P G	X	0.40 ¹¹²	—	United States of America
Delaware TPE ¹	TPE	200	(Armateur) Wilh. Wilhemsen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Delco ¹²³	KIZB	300	Delco S.S. Co., New York	300, 600	P G	X	0.20	—	United States of America
Delfin CJD	CJD	—	Navy	300, 600	P G	X	—	—	Spain
Delfin EFD ²	EFD	150	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Delfina KIVS ^{9 131}	KIVS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Delfina TOD ¹	TOD	200	Sainz e Inchaustegui, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Delfinen ¹	ODV	—	Navy	600	O ³⁹	X	—	—	Denmark
Delft ¹	PXW	200	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Delftland ¹	PDV	200	Koninklijke Nederlandsche Lloyd, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Delfshaven ¹	HEX	150	Maatschappij Stoomschip Delfshaven, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Delfi ¹	GEJK	—	Navy	—	P G	X	—	—	Great Britain
Delfi ¹	PGG	150	Stoomvaart Maatschappij, Rotterdam	300, 450, 600	P G	X	0.40	4.00	Holland
Delight ⁹⁷	KQOE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Deligny	FAXO	—	Navy	600, 800	P G	N	0.05	—	France
Delisle ⁹⁷	KIVT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	X	0.40	—	United States of America
Delivery No. 5	KDCK	—	Standard Oil Co. of New York, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Delong ²⁹	NWB	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Delores de la Torre ¹	ECQ	180	Alvaro de Moutas, Oviedo	300, 600	P G	N	0.40 ¹¹²	—	Spain
Delfin ADC ¹	ADC	—	Navy	—	O	N	—	—	Germany
Delfin TGR ¹	TGR	100-150	G. Viassopulo Frères et S. Cottakis, Piræus	300, 600	P G	X	0.30	4.00	Greece

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Derby ¹³¹	GKEM	—	Navy	—	P G	—	—	—	Great Britain
Derbyline ¹³¹	KIRT	300	U.S. Shipping Board	300, 450, 600	P G	X	0.40	—	United States of America
Derbyshire ¹⁰	MYB	300	—	300, 450, 600	P G	X	0.40	—	Great Britain
Derindje ¹	OLY	200	Cargadoors-en Scheepvaart-Kantoor Levant, Rotterdam	300, 400, 600	P G	X	0.40	4.00	Holland
Derna ¹⁷	IAX	140	Società Italiana di Servizi Marittimi, Rome	300, 600	P G	X	0.40	—	Italy
Dernes ¹⁹	GCVN	—	—	300, 600	P G	X	0.40	—	Great Britain
Deroche ¹⁰⁸	KOHJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
De Ruijter	PAC	—	Navy	600	O ⁸⁹	—	—	—	Holland
Derwent	GKEN	—	Navy	—	P G	—	—	—	Great Britain
Derwent River ¹⁹	ZEF	170	—	300, 600	P G	X	0.40	—	Great Britain
Deseado ^{19 89}	GCRX	250	—	300, 600	P G	N	0.40	—	Great Britain
Desirade ¹	FKO	250	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	X	0.40	—	France
Des Moines ⁹⁹	NEN	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Des Moines Bridge ¹⁰³	KUCG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Desna ^{19 89}	GCRY	250	—	300, 600	P G	N	0.40	—	Great Britain
Despatch ¹⁰²	NIDF	—	—	300, 600	P G	N	—	—	United States of America
D'Estrées	FAIE	—	Navy	300, 800	P G	N	0.05	—	France
Detroit ¹⁰⁸	GJNT	—	—	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	Great Britain
Detroit ¹⁰⁸	NISP	—	—	300, 600	P G	N	—	—	United States of America
Detroit-Wayne ¹⁰⁹	KONX	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Deucalion TXQ ¹	TXQ	150	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Deucalion YOW ¹¹	YOW	—	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Deuel ¹⁷	KOMD	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Deutschfeld ³³	DBG	200	Neue Dampfer Compagnie, Stettin	300, 600	P G	X	0.40	4.00	Germany
Deutschland DDE ³³	DDE	200	—	300, 600	P G	X	0.40	—	Germany
Deutschland DDU ³³	DDU	110	Preussische Eisenbahnverwaltung,	300, 375, 600	P R ⁶⁸	X	0.30	3.00	Germany

Shipboard Stations

Devauger ¹	AWU	175-200	Barcelona (Armateurs), Westfal, Larsen & Co., A/S Bergen	300, 600	P G	N	0.30	3.00	Spain
Devanha ¹⁹	MOU	180	—	300, 600	P G	X	0.40	4.00	Norway
Devolente ¹⁰³	KIVR	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Great Britain
Devon ¹⁹	ZBJ	180	—	300, 600	P G	—	0.40	—	United States of America
Devon City ¹⁹	ESD	150	—	300, 600	P G	0800 to 1200	—	—	Great Britain
Devonia ¹⁰	GFNM	—	—	300, 450, 600	P G	1400 to 1500	0.40 ⁸⁷	1.00 ⁸⁷	Great Britain
Devonier ¹⁰	ODW	150-200	Lloyd Royal Belge	300, 600	P G	1800 to 2400	0.10 ⁸⁷	4.00	Great Britain
Dewey KDNF ^{9 131}	KDNF	300	Andrew Olsen	300, 450, 600	P G	X ²	0.40	—	Belgium
Dewey KODT ¹⁰³	KODT	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Dewsbury ⁷¹	BEQ	—	Great Central Railway Co. Navy	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
De Zeven Provinciën	PAA	—	Daniel F. McAllister	600	O 4	—	—	—	Holland
D. E. McAllister ²	KEIT	150	Standard Oil Co. of California, Incorp.	300, 600	P G	X	0.40 ¹¹¹	—	United States of America
D. G. Scofield ^{9 131}	WRD	300	Standard Oil Co. of California, Incorp.	300, 450, 600, 1,800	P G	X	0.20	0.40 ¹¹²	United States of America
Dia (El) ²	KKY	200	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 450, 600	P G	X	0.40 ¹¹¹	—	United States of America
Diablo ⁸⁷	KEPD	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Diadem ¹⁹	GDRX	—	Job Bros., Company	300, 600	P G	X	0.40	—	Great Britain
Diana ⁴⁷	VOQ	150	—	300, 600	P G	X	0.40	4.00	Newfoundland
Diana FAIN	FAIN	—	Navy	300, 800	P G	N	0.05	—	France
Diana OWB ¹	OWB	—	Navy	600	O 48	X	0.20 ¹¹¹	—	Denmark
Dickerson ⁴⁹	NAFC	—	Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Dictator ¹⁹	BDH	170	(Armateurs) B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	4.00	Great Britain
Dicto ²³	LGZ	100-150	Navy	300, 600	P G	X	0.40	—	Norway
Diderot	FACD	—	Navy	300, 800	P G	N	0.05	—	France
Dido GDTM ¹⁹	GDTM	150	Navy	300, 600	P G	X	0.40	—	Great Britain
Dido GEXS	GEXS	—	London, Brighton & South Coast Railway Co.	300, 600	P G	—	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Dieppe ⁷¹	MRL	90	Navy	300, 600	P G	N	—	—	Great Britain
Diez de Octubre	PWP	—	Navy	—	O	—	—	—	Cuba
Diez y Ocho de Julio	WWF	55	Navy	450, 600	P G	—	0.40	—	Uruguay
Digby ¹⁹	MNG	190	—	300, 600	P G	—	—	—	Great Britain
Dilga ¹	VXE	250	—	300, 600	P G	0600 to 0800	0.20 ⁸	—	Australian Commonwealth
Dilgaue	GEXT	—	Navy	—	P G	0900 to 1200	0.40	—	Great Britain
Diligente	FBDL	—	Navy	300, 800	P G	1400 to 1800	—	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Dikera ¹ ..	VZD	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Dillwyn ^{9 131} ..	KODX	300	U.S. Shipping Board	300, 450, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	United States of America
Dilly ..	CTX	100-150	Navy ..	300, 600	O ..	—	—	—	Portugal
Diliwara ¹⁰ ..	GCV	200	—	300, 600	P G ..	—	0.40	—	United States of America
Dilworth ..	KOVJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	—	0.40	—	Australian Commonwealth
Dimboola ¹ ..	VHL	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Dimitri ..	RCB	200-250	—	300, 600	P G ..	—	0.40	—	Russia
Dinard ¹ ..	UDM	150	Société Maritime Nationale, 5, Rue Boudreau, Paris	300, 600	P G ..	—	0.40	—	France
Dinamare ¹⁷ ..	IBY	140	Transoceanica, Società di Navigazione, Naples	300, 600	P G ..	—	0.40	—	Italy
Dinoga ¹ ..	VXU	250	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40	—	Australian Commonwealth
Dinsmore ^{9 131} ..	KDKN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	—	0.40	—	United States of America
Dinteldijk ¹ ..	HDU	200	Nederlandsche Amerikaansche Stoomvaart-Maatschappij, Holland-America Lijn, Rotterdam	300, 450, 600, 800	P G ..	—	0.40	4.00	Holland
Dio ¹⁰³ ..	WNEO	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	—	0.40	—	United States of America
Diogenes ⁵⁰ ..	GCSV	350	—	300, 450, 600	P G ..	—	0.40	—	Great Britain
				300, 450, 600	P G ..	—	0.40	—	Great Britain

Dionysios, Stathatos ¹	SWC	150-200	Dionysios Stathatos, Athens	300, 600	P G	X	4.00	Greece
Diplomat ¹	GFVC	—	—	300, 450, 600	P G	X	0.40	Great Britain
Director ETB ¹⁹	ETB	180	—	300, 600	P G	X	0.40	Great Britain
Director KIGJ ¹⁰⁸	KIGJ	150	Northern Transportation Co.	300, 450, 600	P G	X	0.40	United States of America
Direktor Stolz ⁴⁸	DDZ	200	—	300, 600	P G	X	0.40	Germany
Dirigo ¹⁰⁸	KEGM	—	Texas Company, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Dirksland ¹	OMM	150	Stoomvaart-Maatschappij Nederlandsche Lloyd, Rotterdam	300, 600	P G	X	0.40	Holland
Dirphys ¹	SVZ	100-150	Panhellénique Steam Navigation Co.	300, 600	P G	N	0.40	Greece
Discoverer EIF ¹⁹	EIF	170	—	300, 600	P G	X	0.40	Great Britain
Discoverer NIJT ¹³⁵	NIJT	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	United States of America
District of Columbia ⁹¹	KDMZ	—	Compagnie Nantaise de Navigation à Vapeur, Nantes	300, 600	O	X	—	Germany
Ditmar Koel ¹	DKV	28	American Sugar Transit Corporation, 117, Wall St., New York (N.Y.)	300, 600	P G	X	0.40	United States of America
Divatte ¹	FAU	350	Navy	300, 450, 600	P G	X	0.20	United States of America
Dixiano ⁹ 131	KDSP	—	Standard Transportation Company, 26, Broadway, New York (N.Y.)	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Dixie ⁹⁹	NEP	—	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	Holland
Dixie Arrow ⁹ 131	KDVT	300	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	Holland
Djambi ¹	PIM	150	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	Holland
Djebres ¹	PGD	150	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	Holland
Djember ¹	PHF	150	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	Great Britain
Djerissa ⁷¹	GZC	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 600	P G	X	0.40	Holland
Djoeja ¹	PFU	100	Stoomvaart Maatschappij, Rotterdam	300, 600, 800	P G	X	0.40	United States of America
Dobbin ¹⁰⁸	NUNR	—	Government Ship (Department of Agriculture)	300, 600	P G	N	—	United States of America
Doce de Octubre ¹	LRW	—	U.S. Shipping Board, Washington (D.C.)	450, 600	O	N	—	Argentine Republic
Dochet ⁹⁷	KIMR	—	L. A. Platt	300, 600	P G	X	0.40	United States of America
Dochra ⁹ 131	KGL	300	Compagnie des Messageries Maritimes, Paris	300, 450, 600	P G	X	0.40	United States of America
Docteur Pierre Benoit ¹	FIK	400	Canadian Government Station (Department of Marine & Fisheries), Ottawa (Ont.)	300, 600	P G	N	0.40	France
Dogra ¹⁹	BPB	—	Cary Davis Tug & Barge Company	300, 600, 800	P G	X	0.40	Great Britain
Dollard ¹	VDO	100	Navy	300, 600, 800	O	X	—	Canada
Dolly, C.	KFAL	150	Mortimer L. Schiff	300, 450, 600	P G	X	0.20	United States of America
Dolphin FAOD	FAOD	—	Navy	300, 800	P G	N	0.05	France
Dolphin GEXV	GEXV	—	Navy	—	P G	—	—	Great Britain
Dolphin KDYZ ²	KDYZ	150	Mortimer L. Schiff	300, 450, 600	P G	X	0.40 ¹¹¹ 0.20 ¹¹²	United States of America
Dolphin NEQ ⁹⁹	NEQ	—	Navy	300, 600	P G	N	0.40 ¹¹²	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Dolphin Shell ¹⁹	ZFP	200	—	300, 600	P G	X	0.40	—	Great Britain
Dornala ¹⁹	GDMV	—	—	300, 600	P G	X	0.40	—	Great Britain
Domburg ¹	HEZ	150	Vrachtaart Maatschappij Bothnia, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Domingo ¹⁷	IPM	140	Censini Stefano Arenzano	300, 600	P G	X	0.40	—	Italy
Domingo de Larrinaga ¹⁹	ZJC	170	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Dominic ¹⁹	ZKQ	180	—	300, 600	P G	X	0.40	—	Great Britain
Domion Miller ¹⁹	GFTV	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Domira ¹⁹	VJR	140	—	300, 600	P G	X	0.40	—	Great Britain
Donald McKay ⁹⁷	KULL	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Donastia ¹	HNJ	150	Compania Anonima de Navegacion, Azpettia	300, 600	P G	N	0.30	3.00	Spain
Donato ²	TIW	150	Cia de Comm., S. A.	300, 600	P G	N	0.30	3.00	Spain
Donax ¹⁹	ZNL	185	—	300, 600	P G	X	0.40	—	Great Britain
Dondo ⁶¹	CSD	100-150	—	300, 600	P G	X	0.40	4.00	Portugal
Dougarra ¹	VJW	250	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	Australian Commonwealth
Dongola ¹⁹	MNH	240	Donna Lane Motorship Corporation	300, 600	P G	N	0.40	—	Great Britain
Donna Lane ²	KDGN	200	—	300, 600	P G	X	—	—	United States of America
Doon	GFUT	—	Navy	—	P G	—	—	—	Great Britain
Doonholm ¹⁹	ZXM	130	—	300, 600	P G	X	0.40	—	Great Britain
Dora Baltea ¹⁷	ITK	140	Navigazione Alta Italia, Turin	300, 600	P G	X	0.40	—	Italy
Dorade	FADO	—	Navy	300, 800	P G	N	0.05	—	France
Dorado	CLE	—	Navy	—	O	N	—	—	Spain
Dorchester ¹⁰³	KQD	150	Merchants & Miners Transportation Co.	300, 450, 600	P G	N	0.10	—	United States of America
Dordogne	FAND	—	Navy	300, 800	P G	N	0.05	—	France
Dordrecht ¹	OMT	150	Stoomvaart Maatschappij de Maas, Rotterdam	300, 450, 600, 800	P G	N	0.40	—	Holland
Doristar ²¹	GCVQ	250	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.+8	300, 450, 600	P G	N	0.40	—	Great Britain

Doris ¹⁹	LSN	150	—	—	300, 600	PG	..	X	0.40	Great Britain
Dorington Court ¹⁹	MWR	176	—	—	300, 600	PG	..	X	0.40	Great Britain
Doris SYV	SVY	—	—	—	—	O	..	—	—	Greece
Doris UDR ¹	UDR	300	—	—	300, 600	PG	..	N	0.40	France
Dorking	GEZL	—	—	—	—	PG	..	—	—	Great Britain
Dorothy Bradford ²	KNA	100	—	—	300, 600	PR	..	X	—	United States of America
Dorset ⁷¹	GRY	320	—	—	300, 450, 600	PG	..	—	0.40	Great Britain
Dorsetshire ⁵⁰	GDKB	100	—	—	300, 450, 600	PG	..	—	0.40	Great Britain
Dorsey ⁹⁹	NELG	—	—	—	300, 450, 600	PG	..	N	0.40 ¹¹¹ 0.20 ¹¹²	United States of America
Dorsoduro ¹⁷	UPV	190	—	—	300, 600	PG	..	X	0.40	Italy
Dosina ¹⁹	GFKY	—	—	—	300, 450, 600	PG	..	X	0.40	Great Britain
Dotterel ¹⁹	ZRC	—	—	—	300, 600	PG	..	X	0.10 ⁸⁷	Great Britain
Doucetouët FBT ¹	FBT	200	—	—	300, 600	PG	..	X	0.40	France
Douglas GEKN	GEKN	—	—	—	—	PG	..	—	—	Great Britain
Douglas GFEX ¹⁹	GFEX	100	—	—	300, 600	PG	..	N	0.10 ⁸⁷	Great Britain
Doukkala ¹	FPD	200	—	—	300, 600	PG	..	X	0.40	France
Douwe Aukes	PBB	—	—	—	600	O ⁴	..	—	—	Holland
Dover Maru ¹	JNU	400	—	—	300, 600	PG	..	—	0.40	Japan
Dovreifjell ¹	LHZ	150-175	—	—	300, 600	PG	..	X	0.40	Norway
Downes ⁹⁹	NIN	—	—	—	300, 600	PG	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Doyen ⁹⁹	NUJS	—	—	—	300, 600	PG	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Doylestown ⁹⁷	KIPG	200	—	—	300, 600	PG	..	X	0.40	United States of America
Doudart-de-Lagrée	FADL	—	—	—	300, 800	PG	..	N	0.05	France
Douro CTG	CTG	100-150	—	—	300, 600	O	..	—	—	Portugal
Douro ODJ ¹⁹	ODJ	125	—	—	300, 600	PG	..	X	0.40	Great Britain
Draa ¹	FPZ	200	—	—	300, 600	PG	..	N	0.40	France
Drache ¹	ADA	—	—	—	—	O	..	—	—	Germany
Drachenfels ³³	DBT	200	—	—	300, 600	PG	..	N	0.40	Germany
Draco ¹⁹	GFQB	—	—	—	300, 450, 600	O	..	X	—	Great Britain
Draga 13 C. ¹	LPQ	100	—	—	500	O	..	X	0.40	Argentine Republic
Draga 14 C. ¹	LPP	100	—	—	500	O	..	N	—	Argentine Republic
Draga 16 C. ¹	LPO	100	—	—	500	O	..	N	—	Argentine Republic
Draga 209 C. ¹	LPN	275	—	—	600	O	..	N	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Draga 210 C ¹	..	275	Government Ship (Department of Public Works)	500	O ..	N	—	—	Argentine Republic
Draga 211 C ¹	..	100	Government Ship (Department of Public Works)	600	O ..	N	—	—	Argentine Republic
Draga 212 C ¹	..	275	Government Ship (Department of Public Works)	600	O ..	—	—	—	Argentine Republic
Dragon	..	—	Navy	—	P G	—	—	—	Great Britain
Dramatist ¹⁹	..	350	(Armateurs) A/S den Norske Amerika-Linje, Christiania	300, 600	P G	X	0.40	—	Great Britain
Drammensford ¹	..	100-150	Navy	300, 600	P G	X	0.40	4.00	Norway
Draug	..	—	Navy	—	O ..	—	—	—	Norway
Drayton ²⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Dreadnaught ²⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Drechtduijk ¹	..	200	Nederlandsche - Amerikaansche Stoomvaart - Maatschappij Holland - Amerika Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Drechterland ¹	..	150	Koninklijke Hollandsche Lloyd, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Drechtstroom ¹	..	200	Hollandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Dredgol ¹	..	—	—	300, 600	P ..	X	—	—	Great Britain
Drente ¹	..	150	Bureau Wijsmuller Scheepvaart Transport en Zeesleepvaart Maatschappij, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Dristighetten	..	—	Navy	—	O ⁸ ..	—	—	—	Sweden
Dromana ¹	..	250	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Drôme ¹	..	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Dromore ¹⁹	..	180	—	300, 600	P G	X	0.40	—	Great Britain
Dromore Castle ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain

	OIYA	250-300	Aktieselskabet Dampstabs-Selskab, Copenhagen	300, 450, 600, 800, 450-3,600 (1,800, 3,600)	F U		0.40			
Dronning Maud ⁴⁰										
Dront ¹⁹	YDL	—	Navy	300, 600	P G	X	0.40	—	—	Great Britain
Drott	SBW	—	Rederiaktiebolaget Sverige-Nord-	300, 600	O	N	0.40	—	—	Sweden
Drottningsholm ⁶⁷	STM	250	Amerika, Gothenburg, Gothen-	300, 600	P G			4.00	—	Sweden
			burg-New York Line							
Drottning Victoria	SCP	—	Navy	—	O	X	—	—	—	Sweden
Drottning Viktoria ¹	SEB	100	Ferry Boat of the Sassnitz-Tralle-	300, 375, 600	P R ⁸⁸		—	—	—	Sweden
Druid ²	VDH	100	Borg Line ⁶⁷	300, 600	O	X	—	—	—	Canada
			Canadian Government Station							
			(Dept. of Marine and Fisheries,							
			Ottawa, Ont.)							
Dryden ZHW ¹⁹	ZHW	—	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	—	Great Britain
Dryden KORK ¹⁷	KORK	300	(D.C.)	300, 600, 1,800	P G	X	0.40	—	—	United States of America
Dubne ¹	PZS	125	Van Nievelt Goudiraan Stoom-	300, 600	P G	X	0.40	4.00	—	Holland
Dublin	GEJM	—	vaart, Maatschappij, Rotterdam	—	P G		—	—	—	Great Britain
Dubourdieu	FBDU	—	Navy	300, 800	P G	X	0.05	—	—	France
Duc D'Aumale ^{68 1}	FGD	250	Compagnie Générale Transatlan-	300, 600	P G		0.10	—	—	France
			tique, Paris							
Duchess of Argyll ¹⁹	GJLS	—	Midland Railway Co.	300, 450, 600	P G	X	0.10 ⁸⁸	1.00 ⁸⁸	—	Great Britain
Duchess of Devonshire ⁷¹	GPP	150	Navigatione Libera Triestina,	300, 400, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	—	Great Britain
Duchessa d'Aosta ¹⁷	UPJ	190	Trieste	300, 600	P G	N	0.40	—	—	Italy
Duca d'Aostar ¹⁷	IZT	270	Navigatione, Générale Italiana,	300, 600	P G	N	0.40	—	—	Italy
			Genoa							
Duca degli Abruzzi ¹⁷	IZZ	270	Navigatione Générale Italiana,	300, 600	P G	N	0.40	—	—	Italy
			Genoa							
Du Chaffault	FBDC	—	Navy	300, 800	P G	N	0.05	—	—	France
Duconétic FBDC	FBDC	—	Navy	300, 800	P G	N	0.05	—	—	France
Duendes ¹⁹	GCSB	250	Navy	300, 600	P G		0.40	—	—	Great Britain
Dufferin ²	VUB	150	Royal Indian Marine	600	O	X	0.40 ⁸⁸	—	—	India
Duffield ¹⁹	ZQJ	150	—	300, 600	P G	X	0.40	—	—	Great Britain
Duguay-Trouin	FBDC	—	Navy	300, 800	P G	N	0.05	—	—	France
Dutillo	IHB	—	Navy	—	—	X	—	—	—	Italy
Duisburg ³⁵	DRY	120	—	300, 450, 600	P G	X	0.40	4.00	—	Germany
Duke of Argyll ⁷¹	YWK	110	Lancashire & Yorkshire and	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	—	Great Britain
			London & North Western Rail-							
			way Companies							
Duke of Clarence ⁷¹	YWL	110	Lancashire & Yorkshire Railway	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	—	Great Britain
			Co.							
Duke of Connaught ⁷¹	YWI	110	Lancashire & Yorkshire and	300, 600	P G	N	0.10 ⁸⁸	1.00 ⁸⁸	—	Great Britain
			London & North Western Rail-							
			way Companies							
Duke of Cornwall GFRX ⁷¹	GFRX	—	Lancashire & Yorkshire Railway	300, 450, 600	P G	X	0.10 ⁸⁸	1.00 ⁸⁸	—	Great Britain
			Company, and London North							
			Western Railway Company.							
			Operated by the Lancashire &							
			Yorkshire Railway Company,							
			Manchester							

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radiotelegram.	
Duke of Cornwall XFG ¹⁹	XFG	120	Duke of Cornwall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	Great Britain
Duke of Cumberland ²¹	YWJ	110	Lancashire & Yorkshire and London & North Western Railway Companies	300, 600	P G ..	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Dulcino ^{9 121}	KTV	150	American Sugar Transit Corp.	300, 450, 600	P G	X	0.20	—	United States of America
Dulluna ²	TMR	200	Juan B. Bares, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Dumana ¹⁹	GDNF	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Dumbéa ¹	FND	300	Société des Services Contractuels, des Messageries Maritimes, 9, Rue de Seze, Paris	300, 600	P G ..	— ²⁷	0.40	—	France
Dumfries ¹⁹	BFA	150	Navy	300, 600	P G ..	X	0.40	—	Great Britain
Dumont d'Urville	FBDV	—	—	300, 800	P G ..	N	0.05	—	France
Dumont d'Urville HPD ¹	HPD	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Dumosa ¹	VXV	250	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Dumra ¹⁹	GFTN	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Dunaff Head ¹⁹	YAQ	150	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Dunara Castle ¹⁹	GPNV	—	Navy	300, 450, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Dunarea FAOL	FAOL	—	—	600, 800	P G ..	N	0.05	—	France
Dunarea FDJ ¹	FDJ	200	Compagnie Havraise de Navigation (Corbier & Cie), Le Havre	300, 600	P G ..	X	0.40	—	France
Dunbridge ¹⁹	OCG	180	—	300, 600	P G ..	X	0.40	—	Great Britain
Duncan ¹⁹	NIR	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Dunclutha ¹⁹	EZA	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Dundalk	GEZM	—	Navy	—	P G ..	—	—	—	Great Britain
Dundon	GEZN	—	Navy	—	P G ..	—	—	—	Great Britain
Dundrennan ¹⁹	EJI	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Dundrum Castle ¹⁹	YAX	—	—	300, 600	P G ..	X	0.40	—	Great Britain

Ship	VXW	250	Company	300, 600	PG	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 0.40 ⁸	Origin
Dundubh ⁹	..	..	..	300, 600	..	..	..	Great Britain
Dunedin ⁹	GEIN	..	..	300, 600	P G	..	0.40	Great Britain
Dunera ¹⁹	GUU	230	..	300, 450, 600	P G	..	0.40	United States of America
Dungannon ⁹ 131	KUZV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	..	Great Britain
Dungeness ¹⁹	ELQ	150	..	300, 600	P G	X	0.40	Great Britain
Dunkerque	FAHD	..	..	300, 800	P G	..	0.05	France
Dunluc Castle ¹⁹	MOO	250	..	300, 600	P G	..	0.40	Great Britain
Dunmail ¹⁹	GBSZ	170	..	300, 600	P G	..	0.40	Great Britain
Dunmore Head ¹⁹	GFXN	..	..	300, 450, 600	P G	X	0.40	Great Britain
Dunolly ¹⁹	BNW	115	..	300, 600	P G	X	0.40	Great Britain
Duns Law ¹⁹	OCB	..	..	300, 450, 600	P G	X	0.40	Great Britain
Dunstaffnage ¹⁹	GCJW	170	..	300, 450, 600	P G	X	0.40	Great Britain
Dunstan ¹⁹	ZLE	200	..	300, 600	P G	X	0.40	Great Britain
Dunyre ²	KUMF	270	James Botts	300, 450, 600	P G	X	0.10 ⁵	United States of America
Dunvegan Castle ¹⁹	GJMK	..	..	300, 600	P G	X	0.40	Great Britain
Durpur FADP	MPQ	180	..	300, 800	P G	..	0.05	Great Britain
Durpur UJK ¹	UJK	180	Navy, Bourgoin et Fils, Boulogne-sur-Mer	300, 600	P G	X	0.40	France
Dupleix FCD ¹	FCD	180	Compagnie des Chargeurs Réunis, Paris	300, 600	P G	..	0.40	France
Dupleix FIX ¹	FIX	300	Société des Services Contractuels, des Messageries Maritimes, 9, Rue de Seze, Paris	300, 600	P G	..	0.40	France
Dupont ⁹⁹	NWC	..	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Dupuy-de-Lôme	FAUY	..	..	300, 600	P G	..	0.05	France
Du-Petit-Thouars	FAPT	..	..	300, 800	P G	..	0.05	France
Duquesne ⁹⁷	KECS	300	Navy	300, 450, 600	P G	X	0.40	United States of America
Duquesa ¹⁹	ZQC	120	U.S. Shipping Board	300, 600	P G	..	0.40	Great Britain
Durance	FANR	..	Navy	600, 800	P G	..	0.05	France
Durango ²	TIX	500	Compania Navagacion Vascongada, Bilbao	300, 600	P G	..	0.30	Spain
Durango KDBT ⁹⁷	KDBT	..	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Durostor	CVA	130	Marine Department of the Roumanian Government	600	P R ⁷⁰	..	0.30	Roumania
Durban Maru ¹	JKQ	400	Kokusai Kisen Kaisha	300, 600	P G	..	0.40	Japan
Durenda ¹⁹	GFSL	..	..	300, 450, 600	P G	..	0.40	Great Britain
Durham GQC ¹⁹	GQC	145	..	300, 600	P G	..	0.10	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line of Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Durham KDNL 9 131	KDNL	150	France and Canada Oil Transport Co.	300, 450, 600	P G ..	X	0.40	—	United States of America
Durham Castle 19	MON	220	—	300, 600	PG ..	N	0.40	—	Great Britain
Dusseldorf 1	UCO	400	Transports Maritimes de l'Etat	300, 600	PG ..	— 27	0.40	—	France
Duymaer Van Twist 1	AOB	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	PG ..	— 44	0.40	4.00	Dutch East Indies
Dwarf	GFOQ	—	Navy	—	PG ..	—	—	—	Great Britain
Dwarka 10	GFTP	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Dyer 99	NACN	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
E. 1 99	NXS	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
E. 2 99	NXT	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 1 99	NEJB	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 2 99	NEJC	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 3 99	NEJD	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 4 99	NEJF	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 5 99	NEJG	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 6 99	NEJJ	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 7 99	NEJK	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 8 99	NEJL	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 9 99	NEJM	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 10 99	NEJN	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 12 99	NEJQ	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America
Eagle 11 99	NEJP	—	Navy	300, 600	PG ..	N	0.20 111 0.40 113	—	United States of America

Eagle 14 ⁹⁹	..	NEJS	—	Navy	..	..	300, 600	PG	..	N	0.40 111 0.20 112	United States of America
Eagle 15 ⁹⁹	..	NEJT	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 17 ⁹⁹	..	NEJX	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 18 ⁹⁹	..	NEJZ	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 19 ⁹⁹	..	NEKB	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 23 ⁹⁹	..	NEKG	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 24 ⁹⁹	..	NEKJ	—	—	—	—	300, 600	PG	..	N	—	United States of America
Eagle 26 ⁹⁹	..	NEXF	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 28 ⁹⁹	..	NEXM	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 29 ⁹⁹	..	NEXN	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 31 ⁹⁹	..	NEZG	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 32 ⁹⁹	..	NEZJ	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 33 ⁹⁹	..	NIBB	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 34 ⁹⁹	..	NIBD	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 35 ⁹⁹	..	NIBG	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 36 ⁹⁹	..	NIBK	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 37 ⁹⁹	..	NIBM	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 38 ⁹⁹	..	NIBN	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 39 ⁹⁹	..	NIBC	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 40 ⁹⁹	..	NIBF	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 41 ⁹⁹	..	NIBJ	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 42 ⁹⁹	..	NIBL	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 43 ⁹⁹	..	NIBP	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 44 ⁹⁹	..	NIBQ	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 45 ⁹⁹	..	NIBR	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America
Eagle 46 ⁹⁹	..	NIBS	—	Navy	..	..	300, 600	PG	..	N	0.20 111 0.40 112	United States of America
Eagle 47 ⁹⁹	..	NIBT	—	Navy	..	..	300, 600	PG	..	N	0.40 112	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Meters (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Eagle 48 ⁸⁹	NIBV	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 49 ⁸⁹	NIBX	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 50 ⁸⁹	NIBZ	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 51 ⁸⁹	NICB	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 52 ⁸⁹	NICC	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 53 ⁸⁹	NICD	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 54 ⁸⁹	NICF	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 55 ⁸⁹	NICG	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 56 ⁸⁹	NICJ	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 57 ⁸⁹	NICK	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 58 ⁸⁹	NICL	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 59 ⁸⁹	NICM	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle 60 ⁸⁹	NICN	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Eagle GKER	GKER	—	Navy	—	P G	—	—	—	Great Britain
Eagle KDBF ²	KDBF	150	W. K. Vanderbilt, Jr., Grand Central Terminal, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Eagle KIR ²	KIR	300	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Eagle VOU	VOU	150	—	300, 600	P G	X ⁸⁷	0.40	4.00	Newfoundland
Earl Kitchener ¹⁹	GJNC	—	—	300, 600	P G	X	0.40	—	Great Britain
Earlshall	GFZI	150	Operated by J. Thompson, Exchange Buildings, Newcastle	300, 600	P G	X	0.40	—	Great Britain
Earlswood ¹⁹	YDD	125	—	300, 600	P G	X	0.40	—	Great Britain
E. A. Morse ⁸⁷	KOVN	—	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America

Shipboard Stations

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Ship	NEPT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
East Cape ^{9 131}	KENC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
East Chicago ¹⁰³	KUDZ	300	U.S. Shipping Board	300, 600	P G	X	United States of America
East Hampton ²	KDFZ	150	C. E. Davis Packing Co., Fleeton (Va.)	300, 450, 600	P R	X	United States of America
East Indian ⁹⁷	WGEI	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
East Side ¹⁰³	KIMQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	United States of America
East Wind ¹⁰³	KEKB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Eastgate ¹⁹	BFH	135	—	300, 600	P G	X	Great Britain
Easterling ¹⁰³	KEJD	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Eastern ⁷¹	YUH	—	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	Great Britain
Eastern Admiral ⁹⁷	KURM	300	U.S. Shipping Board	300, 600	P G	N	United States of America
Eastern City ¹⁰	YGZ	145	—	300, 600	P G	X	Great Britain
Eastern Prince ¹⁵	GBDZ	—	U.S. Shipping Board	300, 600	P G	X	United States of America
Eastern Belle ⁹⁷	KUJT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Eastern Breeze ^{9 131}	KOPP	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Eastern Chief ⁹⁷	KSEL	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Eastern Coast ⁹⁷	KURX	—	U.S. Shipping Board	300, 600	P G	X	United States of America
Eastern Crag ¹⁰³	KUJV	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Eastern Cross ¹⁰³	WKIU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Eastern Crown	KUNQ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	United States of America
Eastern Dawn ⁹⁷	KUQT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Easterner ¹⁰³	WGEA	300	U.S. Shipping Board	300, 450, 600	P G	X	United States of America
Eastern Gale	KUDZ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Eastern Glade ⁹⁷	KUND	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	United States of America
Eastern Glen ¹⁰³	KUVE	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	United States of America
Eastern Guide ¹⁰³	KUCN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Eastern King ^{9 131}	WFEA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Eastern Knight	KUFB	—	U.S. Shipping Board	300, 450, 600	P G	X	United States of America
Eastern Leader ⁹⁷	KDHY	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Eastern Light ¹⁰³	WKII	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Eastern Maid ^{9 131}	KUTF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Eastern Mariner ¹⁰³ .	KUCB	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Moon ¹⁰³	KUDX	200	U.S. Shipping Board	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Pilot ^{9 121}	KULJ	200	U.S. Shipping Board	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Planet ⁹⁷ .	KUPD	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
Eastern Queen ⁹⁷	KXUE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Eastern Sailor ¹⁰³	KUZZ	—	U.S. Shipping Board	300, 600	P G	X	0.40	—	United States of America
Eastern Sea ⁹⁷ .	KTEA	300	U.S. Shipping Board	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Shore ^{9 121}	WKIO	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Eastern Star ¹²³	KTAU	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.20	—	United States of America
Eastern States ^{9 121}	WEE	125	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.20	—	United States of America
Eastern Sun ¹²³	KTIE	300	Detroit and Cleveland Navigation Co., Detroit (Mich.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Sword ⁹⁷	KDKB	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Tempest ^{9 121}	KUVG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Temple ⁹⁷	KDEZ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastern Trader ^{9 121}	KULK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
Eastern Victor ^{9 121}	KUNR	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastmoor ¹⁹	GJMT	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Eastney ¹⁹ .	GFJB	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Eastport ^{9 121}	WCIE	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Eastway ¹²	ZZX	—	—	300, 450, 600	P G	X	0.40	4.00	Great Britain
Eastwood ¹⁹	ZWN	160	—	300, 600	P G	X	0.40	—	Great Britain
Eaton Grove ¹⁹	BOZ	120	—	300, 600	P G	X	0.40	—	Great Britain
Eaton Hall ¹⁹	EZY	120	—	300, 600	P G	X	0.40	—	Great Britain
Ebani ¹⁹	ZCG	180	—	300, 600	P G	X	0.40	—	Great Britain
Eboe ¹⁹	ZTE	200	—	300, 600	P G	X	0.40	—	Great Britain
E. B. Osler ²¹	CKE	150	Canada S.S. Lines, Ltd., Montreal	300, 600	P	—	0.40	—	Canada

Logo	Call	Frequency	Station	Power	Country	Notes
Ebura 13	ZMV	165	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Eclipse 87	KEGF	300	Inter-Coast Steamship Company, 148, State St., Boston (Mass.)	300, 600	United States of America	
E. C. Pope 103	WZAU	300	Pacific Mail S.S. Co., 508, Market St., San Francisco (Cal.)	300, 600, 1,800	United States of America	
Ecuador 101	WBN	200	(Armateurs) Gorrisen & Co., A/S Christiania	300, 600, 800	Norway	
Eda 1	AWY	250	Nederlandsche Amerikaansche Stoomvaart Maatschappij, Holland Amerika Lijn, Rotterdam	300, 450, 600, 800	Holland	
Edam 1	TXU	200	Navy Association Maritime Belge, Antwerp	300, 600	Great Britain	
Edavana 19	GDPJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	Sweden	
Edda	SBV	150-200	Navy	300, 600	Belgium	
Edea 10	ONH	150-200	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edellyn 97	KIJL	300	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Eden	GKES	—	U.S. Shipping Board, Washington (D.C.)	300, 600	Great Britain	
Edendale 19	OFP	120	U.S. Shipping Board, Washington (D.C.)	300, 450, 530, 600	Great Britain	
Eden Hall 13	ZRF	140	Philip Shore	300, 600	Great Britain	
Edenton 97	KECB	250	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edgar F. Coney	KDHD	—	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edgar F. Luckenbach 97	KGK	250	U.S. Shipping Board, Washington (D.C.)	300, 450, 530, 600	United States of America	
Edgar-Quinet	FADQ	—	Navy	300, 600	France	
Edgefield 103	KEBF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edgehill 131	KETN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	United States of America	
Edgemont 131	KETP	300	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edgemoor 131	KEVF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	United States of America	
Edinburgh Castle 50	MQE	350	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	Great Britain	
Edith 103	KZF	200	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	United States of America	
Edith Cavell 19	YCM	180	(Armateur) Magnus Fische, Bodo	300, 600	Great Britain	
Edith Fische 1	AUN	150-175	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	Norway	
Editor 131	KOBG	300	Kingsley Navigation Company, 313, Pacific Building, Vancouver (B.C.)	300, 600	United States of America	
E. D. Kingsley 32	XWL	300	U.S. Shipping Board, Washington (D.C.)	300, 600	Canada	
Edmore 133	KILJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	United States of America	
Edmund H. Stinnes 135	DET	200	Western Mercantile Marine Corp., Compagnie Française des Câbles Télégraphiques, Paris	300, 600	Germany	
Edmund Stenerson 35	DXZ	200	U.S. Shipping Board, Washington (D.C.)	300, 600	Germany	
Edna Christenson 131	WSJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	United States of America	
Edouard J-eramec	FZJ	250	U.S. Shipping Board, Washington (D.C.)	300, 600	France	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type)	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiotelegram.	
Edouard Shaki ¹	FRS	150	Société les Affréteurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Edouard Watteau ¹	ULR	200	Société des Pêcheries de France, 16, Rue des Pyramides, Paris	300, 600	P G ..	X	0.40	—	France
E. D. Pierce ^{9 121}	KDXL	150	Pioneer S.S. Company ..	300, 600	P G ..	X	0.10 ¹⁰	—	United States of America
Edris ²	KDBG	200	Thos. H. Ince ..	300, 600	P G ..	X	0.20	—	United States of America
Edsall ¹⁰²	NUPM	—	—	300, 600	P G ..	N	—	—	United States of America
Eduardo ²	TNN	200	Compañia Vasco-Valenciana de Navegacion, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Edward Munch ¹	TRL	300	(Armateur) Olaf Orvig, Bergen ..	300, 600	P G ..	X	0.40	4.00	Norway
Edward L. Doheny ^{9 121}	WIE	150	Pan-American Petroleum and Transport Co., Inc., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Edward L. Doheny, Jr. ^{9 121}	WIJ	300	Pan-American Petroleum and Transport Co., Inc., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Edward Luckenbach ²⁷	KGQ	250	Luckenbach Company, Incorp., 44, Whitehall St., New York (N. Y.)	300, 450, 525, 600	P G ..	X	0.40	—	United States of America
Edward Pierce ²	KMOU	200	Crowell & Thurlow S.S. Co., 131, State St., Boston (Mass.)	300, 600	P G ..	X	—	—	United States of America
Edwards ⁹⁸	NIGL	—	Navy ..	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Elbebeck ^{9 121}	KINQ	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Eemdijk TVI ¹	TVI	200	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Eemdijk TZH ¹	TZH	200	Solleveld Van der Meer en T. H. van Hattum Stoomvaart Maatschappij, Rotterdam	300, 600	P G ..	X	0.40	4.00	Holland
Eenland ¹	PYJ	200	Koninklijke Hollandische Lloyd, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Efingham GEBZ	GEBZ	—	Navy ..	—	P G ..	—	—	—	Great Britain
Efingham KOLT ^{9 121}	KOLT	200	U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America

Eftathios ¹	SWD	150-200	(D.C.)	300, 600	P G	X	0.40	4.00	Greece
Erichia Vergotti ¹	TCH	100-150	G. Vergottis, Athens	300, 600	P G	X	0.40	4.00	Greece
Egalite ¹	HRL	200	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Ega ¹	GRO	220	Coast Shipbuilding Company	300, 600	P G	X	0.40	—	Great Britain
Egeria ⁹⁷	KDCJ	300	—	300, 600	P G	X	0.20	—	United States of America
Eggesford ¹⁰	YXJ	170	Stockholms Rederiaktiebolag Svea, Stockholm	300, 600	P G	X	0.40	2.80	Great Britain
Egl ¹	SIN	100	—	300, 600	P G	X	0.25	—	Sweden
Egill Skallagrims ⁹⁴	TFI	150	Kiveldutur Co., Reykjavik	300, 600	P	X	—	—	Iceland
Eglantier ¹⁰	OGE	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	N	0.40	4.00	Belgium
Eglantine FBR ¹	FBF	150	Société la Pêche Française, Fécamp	300, 600	P G	X	0.40	—	France
Eglantine KOPT ⁹⁷	KOPT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Egorj ¹⁹	VVH	170	—	300, 600	P G	X	0.40	—	Great Britain
Egra ¹⁰	GCSF	190	—	300, 600	P G	X	0.40	—	Great Britain
Egremont ¹⁰⁰	KOQS	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Egremont Castle ¹⁰	YZT	145	—	300, 600	P G	X	0.40	—	Great Britain
Egwanga ¹⁹	YMM	170	—	300, 600	P G	X	0.40	—	Great Britain
Egyptian ¹⁰	GDNY	—	—	300, 600	P G	X	0.40	—	Great Britain
Egyptian Prince ¹⁰	GFTX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Egyptian Transport ¹⁰	GFYX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Egypt Maru ¹	ZDW	140	Kokusai Kisen Kaisha	300, 600	P G	X	0.40	—	Great Britain
Ehrenfels ONHA ⁹⁶	JED	400	—	300, 600	P G	X	0.40	—	Japan
Eibergen ¹	ONHA	150-200	Association Maritime Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Eider II ¹	PIW	200	Zuid-Hollandische Scheepvaart, Maatschappij, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Eider DXL ³⁵	FAF	180	Compagnie Lorientaise de Chantage, Lorient	300, 600	P G	X	0.40	—	France
Eider NIKR ⁹⁹	DXL	200	—	300, 600	P G	X	0.40	4.00	Germany
Eider NURK ²	NIKR	—	U.S. Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹² 0.20	—	United States of America
Eider ZSL ¹⁹	NURK	—	Bureau of Fisheries, Dept. of Commerce, Washington (D.C.)	300, 600	P G	N	—	—	United States of America
Eidsbotten ¹	ZSL	140	—	300, 600	P G	X	0.40	—	Great Britain
Eidsfjeld ¹	AWX	250	(Armateurs) Görrissen & Co. A/S, Christiania	300, 600	P G	X	0.40	4.00	Norway
Eidsfos ¹	LFU	250	(Armateurs) Görrissen & Co. A/S, Christiania	300, 600	P G	X	0.40	4.00	Norway
Eidshorn ¹	TPQ	250	(Armateurs) Görrissen & Co. A/S, Christiania	300, 600	P G	X	0.40	4.00	Norway
Eidshorn ¹	AQAE	200	(Armateurs) Görrissen & Co. A/S, Christiania	300, 450, 600	P G	X	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minim per Radio-telegram.	
Eidsvaag ¹	..	200	(Armateurs) Görissen & Co., A/S, Christiania	300, 450, 600	P G ..	X	0.40	4.00	Norway
Eidsvold	..	—	Navy	—	O	—	—	—	Norway
Eileken ²¹	..	200	Operated by S. B. Joel, 2, Great Stanhope Street, London, W.	300, 600	P G ..	X	—	—	Great Britain
Einat Jarl ¹	..	200-250	(Armateurs) Det Nordenfjeldske Dampskibsselskab-Trendhjem	300, 600	P G ..	X	0.40	4.00	Norway
Eirene ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Eirene Ariadne ¹⁹	..	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Eisbar ²⁵	..	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Eisbrecher, Berlin ²⁵	..	75	—	300, 600	— ⁴⁸	X	0.40	4.00	Germany
Eisbrecher Preussen ²⁵	..	120	—	300, 600	P G ..	X	0.40	4.00	Germany
E. J. Earling ^{9 121}	..	150	Franklin S.S. Company, Cleveland (Ohio)	300, 600	P G ..	X	0.20	—	United States of America
Eidem	..	—	Navy	—	O ⁸	—	—	—	Sweden
Ek ¹	..	100-125	(Armateurs) Fred Olsen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Ekari ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Ekatarioslav ¹⁹	..	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Ekma ¹⁹	..	190	—	300, 600	P G ..	X	0.40	—	Great Britain
Eksjo ¹	..	100-150	(Armateur) H. C. Görissen, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Elabeto ^{9 121}	..	200	Erle M. Leaf	300, 600	P G ..	X	0.40	—	United States of America
Elan	..	—	Navy	600, 800	P G ..	X	0.05	—	France
Elanchove ¹	..	200	Compagnia Marittima Elanchove Bilbao	300, 600	P G ..	X	0.30	3.00	Spain
Elba ¹⁷	..	190	Lloyd del Mediterraneo Società di Navigazione, Rome	300, 600	P G ..	X	0.40	—	Italy
Elbe ²⁵	..	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Elcano NFD ⁸⁹	..	—	Navy	300, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Elcano TLD ¹	..	150	Compañia de Tabacos de Filipinas, Barcelona	300, 600	P G ..	X	0.30	3.00	Spain
Eldena ^{9 121}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Elder Branch ¹⁹	..	170	—	300, 600	P G ..	X	0.40	—	Great Britain
E. L. Doherty Third ^{9 121}	..	300	U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America

Eldorado ^{9 131}	300	Western Transport Company (Amateurs) Backke & Co., (D.C.)	300, 450, 600, 300, 600	P G	X	0.40	United States of America
Eldrid ¹	200	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	Norway
Eldridge ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Eledro ^{9 131}	200	Erle M. Leaf	300, 600	P G	X	0.40	United States of America
Electra ⁷¹	140	Eastern Telegraph Co., Ltd.	300, 450, 600	P	X	0.40	Great Britain
Electrician ¹⁹	170	—	300, 600	P G	X	0.40	Great Britain
Elena Fierros ²	150	Compañia Naviera Fierros, S.A. Oviedo	300, 600	P G	X	0.30	Spain
Elena Margarita ¹	100-150	The Oriental Shipping Co., Ltd., Athens	300, 600	P G	X	0.40	Greece
Eleni Stathatos ¹	150-200	D. A. Stathatos, Athens	300, 600	P G	X	0.40	Greece
Elenora Marsk ⁴⁰	200	Aktieselskabet Dampskibsselskabet Svendborg, Svendborg	300, 450, 600, 800	P G	X	0.40	Denmark
ESCK	200	Marconi, Senatore Guglielmo, Rome	300, 600	P G	X	0.40	Great Britain
ICC	140	Societa Italiana di Servizi Marittimi, Rome	300, 600	P G	X	0.40	Italy
IX	150	Russell A. Alger	300, 450, 600	P G	X	—	United States of America
KOVQ	—	Navy	—	P G	—	—	Great Britain
GEZP	—	Navy	—	P G	—	—	Great Britain
EFIN	—	Navy	—	P G	—	—	Chile
GEV	—	Navy	—	P G	—	—	Norway
ELC	100-125	(Armateur) M. Clausen, Hauge-sund	300, 600	P G	X	0.40	Denmark
ELC	200	Aktieselskabet Dampskibsselskabet Dania, Esbjerg	300, 450, 600, 800	P G	X	0.40	Denmark
OHHA	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 300, 600	P G	X	0.40	Germany
DEJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 300, 600	P G	X	0.40	United States of America
KVR	200	Fratelli Bozzo, D. & E., Genoa	300, 600	P G	X	0.40	Italy
IWU	140	Zuid-Nederlandsche Stoomvaart Maatschappij, Terneuzen	300, 600	P G	X	0.40	Germany
DEC	120	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	Holland
TYA	150	Société Générale d'Armement, Nantes	300, 450, 600, 300, 600	P G	X	0.40	Great Britain
GFXM	—	Compagnie Belge Maritime du Congo, Antwerp	300, 450, 600, 800, 2,100	P G	X	0.40	France
UFU	200	Pan American Petroleum & Transport Co., 1,015, Security Building, Los Angeles (Cal)	300, 600	P G	X	0.40	Belgium
FAK	150	A. H. Bull, S.S. Company, 17, Battery Place, New York (N.Y.)	300, 450, 600, 800, 2,100	P G	X	0.40	United States of America
OPEA	250-500	Compagnie Royal Belge Argentina, Antwerp	300, 450, 600, 300, 600	P G	X	0.40	United States of America
KDGQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
KORC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 300, 600	P G	X	0.40	Great Britain
XFB	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	Great Britain
GJLK	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	Belgium
OTB	100-150	Compagnie Royal Belge Argentina, Antwerp	300, 600	P G	N	0.40	United States of America
KOCL	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
KISG	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
KOFK	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Mini-mum number Radio-tele-gram.	
Ella ³⁵ Ellaston ⁵⁰	DEL GJCR	200 250	—	300, 600 300, 450, 600	P G ..	X X	0.40 0.40	4.00	Germany Great Britain
Ellenia ¹⁷ Ellenga ¹⁹ Ellerdale ¹⁹	USF GCSL YVL	140 250 145	Trieste .. — ..	300, 600 300, 600 300, 600	P G .. P G .. P G ..	X X X X 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40 0.40 0.40	—	Italy Great Britain Great Britain
Ellerwoutsdijk ¹	PYP	200	Solleveld, van der Meer, en T. H. van Hattum's Stoomvaart Maatschappij, Rotterdam	300, 600	P G ..	X	0.40	4.00	Holland
Elida Elina ¹ Elind ¹ Elind ⁹⁹	LAG SWO AZE NERV	150-200 300 —	Navy .. S. G. Embricos, Athens..	300, 600 300, 600, 1,200 300, 600	O .. P G .. P G .. P G ..	— X X X X N	— 0.40 0.20 0.20 111 0.40 112 0.20 111	—	Norway Greece Estonia United States of America
Elis ⁹⁹	NIFD	—	Navy ..	300, 600	P G ..	N	0.40 112	—	United States of America
El Lobo ¹⁹ Elora ¹⁹ Elmera ²⁸	YVB GCSM VGLD	— 250 75	— .. B. C. Government ..	300, 600 300, 600 300	P G .. P G .. O ..	X X X X X	0.40 0.40 0.40	—	Great Britain Great Britain Canada
Elmina ¹⁹ Elm Park ¹⁹ Elmsport ¹⁰³	MZI GDMF KILF	190 300	— .. U.S. Shipping Board, Washington (D.C.) ..	300, 600 300, 600 300, 600	P G .. P G .. P G ..	X X X X X	0.40 0.40 0.40	—	Great Britain Great Britain United States of America
Elpenor ⁷¹	ZKD	—	A. Holt & Co., Managers, Liver- pool ..	300, 450, 600	P G ..	X	0.40	—	Great Britain
Elphinstone ² Elpidoporus ¹ Elpis ¹	VWBX SWH SVL	— 100-150 100-150	Royal Indian Marine Ship .. E. Ladopoulos Sons .. The Hellenic Co. of Maritime ..	— 300, 600 300, 600	O .. P G .. P G ..	X X N X X	— 0.40 0.40	—	India Greece Greece
Elsa ¹	SJD	150	Enterprises, Piraeus .. Svenska Lantmannens Rederiak- tiebolag, Gothenburg ..	300, 600	P ..	X	0.40	—	Sweden
Elsass ¹ Elsce ³⁵	AEL DTJ	— 200	Navy .. Sieg & Co., G.m.b.H., Danzig ..	— 300, 450, 600, 800	O .. P G ..	N X	— 0.40	—	Germany Danzig (Free Town of)
Elsce Hugo Stinnes ³¹ Elsie ¹	DES TGE	200 150-200	The Hellenic Co. of Maritime ..	300, 600 300, 600	P G .. P G ..	X X	0.40 0.40	4.00 4.00	Germany Greece

Elswick House ¹⁹	ZHX	135	(Armateur) H. C. Gorrissen; Christiana	300, 600	P G	X	0.40	Great Britain
Elswick Park ¹⁹	GDOV	125	—	300, 600	P G	X	0.40	Great Britain
Elswick Tower ¹⁹	BER	125	—	300, 600	P G	X	0.40	Great Britain
Elvaston ²⁰	GDIV	100	—	300, 450, 600	P G	X	0.40	Great Britain
Elvenes ¹	TQE	150-200	—	300, 600	P G	X	4.00	Norway
Elveric ¹⁹	MBX	150	—	300, 600	P G	X	0.40	Great Britain
Elwick ¹⁹	MYJ	150	—	300, 600	P G	X	0.15 ⁸²	Great Britain
Elysia ¹⁹	MRH	180	—	300, 600	P G	X	0.40	Great Britain
Elzaster ¹⁹	BQJ	150	—	300, 600	P G	X	0.40	Great Britain
Emanuel Accame ¹⁷	UOF	190	Parodi Angelo, Genoa	300, 600	P G	X	0.40	Italy
Emden ²⁰	DNH	200	—	300, 450, 600, 800	P G	X	0.40	Germany
Emerald, GBNK ¹⁹	GBNK	—	—	300, 600	P G	X	0.40	Great Britain
Emerald GECB	GECB	—	Navy	—	P G	—	—	Great Britain
Emergency Aid ²⁷	KDKD	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	United States of America
Emil George V. Stauss ¹⁸	GPFM	—	Administration of Posts and Tele- graphs	300, 600	P G	X	0.40	Great Britain
Emile Baudot	FZK	250	—	300, 600	P G	N	0.40	France
Emile Deutsch de la Meurthe ¹⁸	GCJS	—	—	300, 450, 600	P G	X	0.40	Great Britain
Emilia S. de Perez ¹	ECE	300	Angel F. Perez, Santander	300, 600	P G	N	0.30	Spain
Emilie, L. D.	FYN	350	L. Dreyfus & Cie., Paris..	300, 600	P G	N	0.40	France
Emita ¹	VHG	300	—	300, 600	P G	N	0.29 ⁸	Australian Commonwealth
Emlynian ¹⁹	GCNL	175	G. Vidor Fils & Cie. (Armateurs), Boulogne-sur-Mer	300, 600	P G	X	0.40	Great Britain
Emma ¹	FWM	180	The Oriental Shipping Co., Ltd., Athens	300, 600	P G	X	0.40	France
Emmanuel ¹	THA	100-150	Fourny & Cie., Boulogne-sur-Mer	300, 600	P G	X	0.40	France
Emmanuella ¹	FHE	200	Société Anonyme Belgo-Améri- caine de Navigation, Antwerp	300, 600	P G	X	0.40	Belgium
Emmanuel Nobel ¹⁰	OOL	100-150	Canada S.S. Lines, Ltd., Montreal, P.Q.	300, 450, 600	P G	X	0.40	Germany
Emma Sauber ²⁵	DEZ	200	Navy	300, 600	P	X ²⁷	0.40	Canada
Emperor ²¹	CKF	150	—	—	P G	—	0.40	Great Britain
Emperor of India	GEBR	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	Great Britain
Empire Star ²¹	GCTB	250	Navy	300, 600	P G	N	0.05	France
Empress ²¹	FBPO	—	South-Eastern & Chatham Rail- way Co.	300, 600	P G	N	0.10 ⁸²	Great Britain
Empress of Asia ²¹	GJI	300	Canadian Pacific Railway, Montreal, P.Q.	300, 600	P G	N	0.40	Canada
Empress of Australia ¹⁹	GFSB	—	—	300, 450, 600	P G	X	0.40	Great Britain
Empress of Britain ¹⁹	MPB	—	—	2,100, 2,200, 2,400	P G	N	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Empress of Canada ²¹ ..	GFXQ	—	Operated by the Marconi Wireless Telegraph Co. of Canada, Ltd.	300, 450, 600, 2,100, 2,200, 2,400	P G ..	N	0.40	—	Great Britain
Empress of China ¹⁹ ..	GFSB	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Empress of France ¹⁹ ..	GYH	250	—	300, 450, 600, 2,100, 2,200	P G ..	N	0.40	—	Great Britain
Empress of India ¹⁹ ..	GCNV	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Empress of Japan ²¹ ..	CJG	250	Canadian Pacific Railway, Montreal, P.Q.	300, 600	P G ..	N	0.40	—	Canada
Empress of Russia ²¹ ..	CJH	300	Canadian Pacific Railway, Montreal, P.Q.	300, 600	P G ..	N	0.40	—	Canada
Empress of Scotland ¹⁹ ..	GCTM	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Empire	VFP	150	Canada Towing and Wrecking Co., Port Arthur, Ont.	300, 600	P ..	— ²⁷	0.40	—	Canada
Empire Arrow	KDUG	—	Standard Transportation Company	—	P G ..	X	0.40	—	United States of America
Emps ³⁵	DEM	120	—	300, 600	P G ..	7000 to 8000 1230 to 1330 1900 to 2000	4.00	4.00	Germany
Em. Z. Svitzer ¹ ..	OGE	200	Altiselskabet Em. Z. Svitzers Bjergnings-Entreprise, Copenhagen	300, 600	P ..	X	0.40	4.00	Denmark
Enare ¹	AQAA	250	(Armateurs) Görrissen & Co., A/S, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Enchantress	GKEW	—	Navy	—	P G ..	—	—	—	Great Britain
Encounter	GABK	—	Navy	—	P G ..	—	—	—	Australian Commonwealth
Endeavour	GEZQ	—	Navy	—	P G ..	—	—	—	Great Britain
Endicotte ²⁷	KODN	200	U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Energie ⁹	VRH	200	Scottish Mexican Oil Co., ..	300, 600	P G ..	X	0.40	—	Bahamas
Enfield ¹⁹	YKE	100	—	300, 600	P G ..	X	0.40	—	Great Britain
Engadine ²¹	GUK	50	South Eastern & Chatham Railway Co.	300, 600	P G ..	N	0.10 ⁸²	1.00 ⁸²	Great Britain
Engageante	FBNT	—	Navy	300, 800	P G ..	N	0.05	—	France
Enggano ¹	TWM	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
England Maru ¹ ..	JAG	400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Englewood ²⁷ ..	WGAA	300	U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America

Enrico Cosenz	IXX	—	150	Navy	Compania Maritima Ballesteros, Aviles	300, 600	PG	..	N	1200 to 1300	Italy	—	0.30	—	3.00	Italy
Enrique Ballesteros ¹	IXX	—	150	Navy	Compania Maritima Ballesteros, Aviles	300, 600	PG	..	N	1400 to 1430	Spain	—	0.05	—	—	Spain
Ensigne-Gabode	FANE	—	—	Navy	..	600, 800	PG	..	N	1630 to 1730	France	—	0.05	—	—	France
Ensigne-Henry	FBXY	—	—	Navy	..	300, 800	PG	..	N	2030 to 0030	France	—	0.05	—	—	France
Ensigne-Roux	FBXR	—	—	Navy	..	300, 800	PG	..	N	2030 to 0030	France	—	0.05	—	—	France
Ensley City ¹	KUZS	—	300	United States Steel Products Co., 30, Church Street, New York (N.Y.)	..	300, 450, 600	PG	..	X	..	United States of America	—	0.40	—	—	United States of America
Entella ¹⁷	INW	—	140	Sicilia Società di Navigazione, Rome	..	300, 600	PG	..	X	..	Italy	—	0.40	—	—	Italy
Enterprise GECD	GECD	—	—	Navy	Matson Navigation Co., 268, Market Street, San Francisco (Cal.)	—	PG	..	—	..	Great Britain	—	0.40	—	—	Great Britain
Enterprise WMN ^{9 131}	WMN	—	150	Transports Maritime de l'Etat	..	300, 450, 600	PG	..	X	..	United States of America	—	0.40	—	—	United States of America
Entete ¹	HWB	—	150	Standard Oil Co. of New York	..	300, 600	PG	..	X	..	France	—	0.40	—	—	France
Entre Rios	LLH	—	200	corp., 26, Broadway, New York	..	450, 600	O	..	N	..	Argentine Republic	—	—	—	—	Argentine Republic
Eocene ^{9 131}	KTM	—	200	Compania Anonima Maritima Union, Bilbao	..	300, 600	PG	..	N	..	United States of America	—	0.20	—	—	United States of America
Eolo ¹	CME	—	150	Nicola's Mihanovich Compania, Ltd., Buenos Aires	..	300, 600	PG	..	N	..	Spain	—	0.30	—	—	Spain
Eolo LOE ¹	LQE	—	135	Navy	..	300, 600	PG	..	N	..	Argentine Republic	—	0.40	—	—	Argentine Republic
E. O Saltmarsh ¹⁹	EPA	—	130	Navy	..	300, 600	PG	..	X	..	Great Britain	—	0.40	—	—	Great Britain
Eparges (Les)	FALE	—	—	Navy	..	300, 800	PG	..	N	..	France	—	0.05	—	—	France
Epernay	FBJE	—	—	Navy	..	300, 800	PG	..	N	..	France	—	0.05	—	—	France
Eperoki ¹	SWU	—	100-150	G. Yanoulatos Bros., Piraeus	..	300, 600	PG	..	X	..	Greece	—	0.40	—	—	Greece
Epinal	FAQE	—	—	Navy	..	300, 800	PG	..	N	..	France	—	0.05	—	—	France
Epiro ¹⁷	LAV	—	140	Puglia Società di Navigazione a vapori, Bari	..	300, 600	PG	..	X	..	Italy	—	0.40	—	—	Italy
Eptacio Pessoa ¹²³	KOCC	—	300	U.S. Shipping Board, Washington (D.C.)	..	300, 600	PG	..	X	..	United States of America	—	0.40	—	—	United States of America
Epsom ¹⁹	ERH	—	—	Cary Davis Tug and Barge Co.	..	300, 600	PG	..	X	..	Great Britain	—	0.40	—	—	Great Britain
Equator	KDVI	—	150	..	..	300, 450, 600	PG	..	X	..	United States of America	—	—	—	—	United States of America
Era ¹	VZBM	—	300	..	..	300, 600	PG	..	X	..	Australian Commonwealth	—	0.20 ⁸	—	—	Australian Commonwealth
Erable	FBCE	—	—	Navy	..	300, 800	PG	..	N	0930 to 1030	France	—	0.05	—	—	France
Ercole	IHX	—	—	Navy	..	300, 800	PG	..	—	1200 to 1300	Italy	—	—	—	—	Italy
Erda ³³	DEF	—	200	Compagnie Nantaise de Navigation à Vapeur, Nantes	..	300, 450, 600	PG	..	X	1400 to 1430	Germany	—	0.40	—	—	Germany
Erdre ¹	FAA	—	300	..	..	300, 600	PG	..	X	1630 to 1730	France	—	0.40	—	—	France
Erebus	GEXC	—	—	Navy	..	—	PG	..	—	2030 to 0030	Great Britain	—	—	—	—	Great Britain
Eretza Mendl ¹	HMO	—	250	Sota y Aznar, Barcelona	..	300, 600	PG	..	N	2030 to 0030 (ship's time)	Spain	—	0.30	—	—	Spain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Erfurt ¹⁰ ..	ORFA	150-200	Association Maritime Belge, Antwerp	300, 600	P G ..	X	0.40	4.00	Belgium
Erignus ¹⁹ ..	GDSR	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Eric Calvert ¹⁹ ..	XEK	125	—	300, 600	P G ..	X	0.40	—	Great Britain
Erich Lindoe ¹ ..	LGV	200	(Armateurs) P. Lindoe & Co., A/S, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Eriesson ⁹⁹ ..	NIS	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ericus ¹⁹ ..	GVK	110	Navy	300, 600	P G ..	X	—	—	Great Britain
Eridano ..	IGO	150	Ship belonging to the Government of the Dutch East Indies	300, 600	O ³⁹ ..	—	—	—	Italy
Eridanus ..	APE	150	Transports Maritimes de l'Etat..	300, 600	P G ..	X	0.40	—	Dutch East Indies
Erie ¹ ..	HSQ	250	(Armateurs) Görrisen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	France
Erie ¹ ..	LCC	150-200	Kokusai Kisen Kaisha ..	300, 600	P G ..	X	0.40	4.00	Norway
Erie Maru ¹ ..	JEL	400	—	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00	Japan
Erik II ⁴⁰ ..	OIKA	150	Aktieselskabet det Forenede Dampskibs-Selskab, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Erik Larsen ³⁵ ..	DLN	200	—	300, 450, 600, 800	P G ..	X	0.40	4.00	Germany
Erika DEA ³⁵ ..	DEA	50-60	—	300, 600	P G ..	X	0.40	4.00	Germany
Ernier ¹⁹ ..	YYX	100-150	Gregory Theophilatos, Athens ..	300, 450, 600	P G ..	X	0.40	—	Great Britain
Erissos ¹ ..	SVE	100-150	—	300, 600	P G ..	X	0.40	4.00	Greece
Eritrea ..	IGX	—	Navy	—	—	—	—	—	Italy
Erivan AQAB ¹⁰ ..	AQAB	100-125	(Armateurs) Tonsberg Hwallangeri, Tonsberg	300, 600	P G ..	X	0.40	4.00	Norway
E. R. Kemp ^{9 m} ..	KDQD	300	Sinclair Navigation Co., 120, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Erland ¹ ..	SJN	150	Angfartsaktiebolaget Tirfing, Gothenburg	300, 600	P ..	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Eriesburgh ⁷¹ ..	GCRD	155	Operated by Rowland & Marwood Steam Ship Co., R. Flowergate.	300, 600	P G ..	X	0.40	—	Great Britain

Embourpolls ¹	SVQ	100-150	The Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G	N	0.40	4.00	ANZANIA
Erne	GKEZ	—	Navy	—	P G	—	—	—	Greece
Ernst ²⁵	DTI	200	Steg & Co., G.m.b.H., Danzig	300, 450, 600, 800	P G	0800 to 1000	0.40	4.00	Great Britain
Ernst Hugo Stinnes ²³	DER	200	—	300, 600	P G	1600 to 1800	0.40	—	Danzig (Free Town of)
Ernest	FARN	—	Navy	300, 800	P G	X	0.40	4.00	Germany
Ernest H. Meyer ²	WMJ	200	Broughton & Wiggins Navigation Company, 909, Yeon Building, Portland (Oregon)	300, 600	P G	N	0.05	—	France
Ernest-Renan	FAHR	—	Navy	300, 800	P G	X	0.40	—	United States of America
Eromanga ³	VHH	300	—	300, 600	P G	N	0.05	—	France
Eros FYF ¹	FYF	250	M.le Baron de Rothschild, 86, Rue de la Fausanderie, Paris	—	P G	0900 to 1030	0.20 ⁸	—	Australian Commonwealth
Eros FYS ¹	FYS	150	Société les Affrèteurs Réunis, Paris	300	P G	1200 to 1300	0.40 ⁸	—	—
Eros UFS ¹	UFS	200	Transports Maritimes de l'Etat	300, 600	P G	1400 to 1430	0.40	—	France
Eros SDN ¹	SDN	250	Rederiet Belos, Helsingborg	300, 600	P	1630 to 1730	0.40	4.00	Sweden
Errázuriz ¹	CAJ	—	Navy	—	P G	2030 to 0030 (ship's time)	—	—	Chile
Erriba ³	VHJ	300	—	300, 600	P G	0900 to 1030	0.20 ⁸	—	Australian Commonwealth
Erroll ¹⁹	ERZ	250	Sterling Ship Company, 943 16th Avenue, N., Seattle (Wash.)	300, 565, 600	P G	1200 to 1300	0.40	—	Great Britain
E. K. Sterling ²	WIS	200-250	(Armateur) Haakon J. Wallem, Bergen	300, 600	P G	1400 to 1430	—	4.00	United States of America
Erviken ¹	AUX	300	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	1630 to 1730	0.40	—	Norway
Escambia ²⁷	KOGK	—	Navy	300, 600	P G	2030 to 0030 (ship's time)	0.40	—	United States of America
Escaut FAZE	FAZE	100-150	Compagnie Royal Belge Argentina, Antwerp	300, 800	P G	X	0.40	—	France
Escaut OSE ¹⁰	OSE	150	Compagnia Transmediterranea, Barcelona	300, 600	P G	N	0.05	—	Belgium
Escolano ¹	TIY	150	Gaston Williams and Wignmore	300, 600	P G	N	0.40	4.00	Spain
Esksani VOV	VOV	—	—	300, 450, 600	P G	X	6.30	—	Newfoundland
Esksani XHC ¹⁹	XHC	150	—	300, 600	P G	X	—	—	Great Britain
Esbridge ¹³	YKG	135	—	300, 600	P G	X	0.40	—	Great Britain
Esmeralda	CAF	—	Navy	—	P G	X	—	—	Chile
Esneh ¹⁸	GDIF	100-150	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Espararte	CTF	300	Compagnie Générale Transatlantique, Paris	300, 600	O	X	—	—	Portugal
Espagne FTE ¹	FTE	300	—	300, 600	P G	X	0.40	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word	Minimum per Radiotelegram.	
Espagne FVE ¹ ..	FVE	250	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.40	—	France
España DEP ²⁵ ..	DEP	200	—	300, 450, 600, 800	P G ..	X	0.40	4.00	Germany
España EBA ..	EBA	550	Navy	—	O ..	—	—	—	Spain
España No. 1 ¹ ..	TIZ	150	El Consejo de Administracion y Gerencia de los Buques Incantados por el Gobierno Espanol	300, 600	P G ..	N	0.30	3.00	Spain
España No. 2 ¹ ..	TJA	150	El Consejo de Admin. y Gerencia de los Buques Incantados por el Gobierno Espanol	300, 600	P G ..	N	0.30	3.00	Spain
España No. 3 ..	TJB	150	El Consejo de Admin. y Gerencia de los Buques Incantados por el Gobierno Espanol	300, 600	P G ..	N	0.30	3.00	Spain
España No. 4 ¹ ..	TJC	150	El Consejo de Admin. y Gerencia de los Buques Incantados por el Gobierno Espanol	300, 600	P G ..	N	0.30	3.00	Spain
España No. 5 ¹ ..	TJD	150	El Consejo de Admin. y Gerencia de los Buques Incantados por el Gobierno Espanol	300, 600	P G ..	N	0.30	3.00	Spain
España No. 6 ..	TJE	150	Station the Ministry of Navy	—	O ..	—	—	—	Spain
España ²⁸ ..	KDO	300	United Fruit S.S. Corporation ..	300, 450, 600	P G ..	X	0.40	—	United States of America
Esperanza ¹⁰³ ..	KWZ	300	New York and Cuba Mail S.S. Co., Pier 13, East River, New York	300, 450, 600	P G ..	N	0.40	—	United States of America
Esperia IZP ¹⁷ ..	IZP	140	Navigazione Orientale, Naples ..	300, 600	P G ..	X	0.40	—	Italy
Esperia IZX ¹⁷ ..	IZX	270	Societa Italiana di Servizi Marittimi, Rome	300, 600	P G ..	N	0.40	—	Italy
Esperia LUZ ¹⁹ ..	LUZ	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Esperle ..	GEZR	—	Navy	—	P G ..	—	—	—	Great Britain
Espesinde ⁶¹ ..	CSV	100-150	—	300, 600	P G ..	X	0.40	4.00	Portugal
Essequibo ¹⁹ ..	MTK	230	—	300, 600	P G ..	N	0.40	—	Great Britain
Essex GXE ¹⁹ ..	GXE	300	—	300, 600	P G ..	N	0.40	—	Great Britain
Essex KQE ..	KQE	150	Merchants and Miners Transport-	300, 450, 600	P G ..	N	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Euclid ¹⁹ Eudunda ²¹	ZQG CGG	180 300	—	300, 600 300, 600	P G .. P G ..	X 0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40 0.20 ⁸	— 0.40 ⁸	Great Britain Australian Commonwealth
Eugène Grosos ¹	FLG	150	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	P G ..	X	0.40	—	France
Eugène Péreire ^{1 56}	FGP	200	Compagnie Générale Transatlan- tique, Paris	300, 600	P G ..	N	0.10	—	France
Eugene V. R. Thayer ^{2 m}	KDMA	300	Sinclair Navigation Co., 120, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Eugenia ¹	SWYS	80	Shipping Traders, Ltd., London	300, 600	P G ..	X	0.40	4.00	Greece
Eugenie S. Embiricos ¹	SWUS	150-200	S. G. Embiricos, Athens	300, 600	P G ..	X	0.40	4.00	Greece
Eugenio Cantoni ^{1 17}	IVG	140	Ente Trasporto Coton, Genoa	300, 600	P G ..	X	0.40	—	Italy
Eugenio Dutrus ¹	TJZ	150	Dutrus y Carsi, Valencia	300, 600	P G ..	N	0.30	3.00	Spain
Euler	FAUL	—	Navy	300, 800	P G ..	N	0.05	—	France
Eumaeus ²¹	GDYW	250	Ocean Steamship Co., Ltd.	300, 450, 600	P G ..	X	0.10	—	Great Britain
Eunice B ²	VGFS	75	Minister of Lands for British Columbia, Victoria, B.C.	450	O ..	X	—	—	Canada
Eupatoria ³²	DEU	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	4.00	Germany
Euphemia ¹	EFT	200	—	300, 600	P G ..	X	0.40	—	France
Euplectela ¹⁹	EVV	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Eurana ^{2 m}	KJG	300	Green Star Steamship Corporation, 120, Broadway, N.Y.	300, 450, 600	P G ..	X	0.40	—	United States of America
Eurelia ¹	CGF	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Eurpides ¹⁹	MSE	240	—	300, 450, 600, 2,100, 2,200	P G ..	X	0.40	—	Great Britain
Euro	IIN	—	Navy	—	—	—	—	—	Italy
Europa ¹⁷	IEE	270	La Veloce Società di Navigazione, Rome	300, 600	P G ..	X	0.40	—	Italy
Europe ¹	FCU	300	Compagnie des Chargeurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France

Shipboard Stations

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	LINE	PORTS OF CALL	DATE	CARRIER	CLASS	FREIGHT	FARE	TAXES	AGENTS
Euryalus ¹⁹	GCZ	180	..	Operated by A. Holt & Co., Managers, Liverpool	P	300, 600	—	0.40	Great Britain
Euryates ⁷¹	YRH	180	..	Operated by A. Holt & Co., Managers, Liverpool	P	300, 600	—	0.40	Great Britain
Eurylocus ⁷¹	YRI	200	..	Operated by A. Holt & Co., Managers, Liverpool	P	300, 600	—	0.40	Great Britain
Eurymachus ⁷¹	YQZ	—	..	Operated by A. Holt & Co., India Buildings, Water Street, Liverpool	P G	300, 450, 600	—	0.40	Great Britain
Eury Parnus ⁷¹	YQU	—	..	Operated by A. Holt & Co., Managers, Liverpool	P G	300, 450, 600	—	0.40	Great Britain
Eurypylus ⁷¹	YRJ	230	..	Operated by A. Holt & Co., Managers, Liverpool	P	300, 450, 600	—	0.40	Great Britain
Eusebia del Valle ¹	HMU	150	..	Julio Benito del Valle, Bilbao ..	P G	300, 600	—	0.30	Spain
Euterpe ¹⁹	BFG	170	..	—	P G	300, 600	—	0.40	Great Britain
Euzkera ¹	CMY	100	..	Compañia Naviera Euzkera Bilbao	P G	300, 600	—	0.30	Spain
Evangelos ¹	SWK	150-200	..	N. Ambatielos, Argostoli (Cephalonia)	P G	300, 600	—	0.40	Greece
Evanger ¹	TQV	100-150	..	(Armateurs) Westfal Larsen & Co., A/S, Bergen	P G	300, 600	—	0.40	Norway
Evans ⁹⁹	NEMS	—	..	Navy	P G	300, 600	—	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Evansville ¹⁰⁸	KIKI	150	..	U.S. Shipping Board, Washington (D.C.)	P G	300, 600	—	0.40	United States of America
Evdromon A	SZP	—	..	Navy	O	—	—	—	Greece
Evdromon B	SZQ	—	..	Navy	O	—	—	—	Greece
Evdromon E.	SZT	—	..	Navy	O	—	—	—	Greece
Evdromon H	SZY	—	..	Navy	O	—	—	—	Greece
Evdromon K	SZZ	—	..	Navy	O	—	—	—	Greece
Evdromon Z	SZU	—	..	Navy	O	—	—	—	Greece
Evdromon T	SZR	—	..	Navy	O	—	—	—	Greece
Evdromon Δ	SZS	—	..	Navy	O	—	—	—	Greece
Evdromon Θ	SZW	—	..	Navy	O	—	—	—	Greece
Evdromon I	SZX	—	..	Navy	O	—	—	—	Greece
Evellé ¹	BREV	—	..	Navy	O	—	—	—	Greece
Evelyn ¹⁰⁸	KZP	200	..	U.S. Shipping Board, Washington (D.C.)	P G	300, 800 300, 600	—	0.05 0.40	France United States of America
Everest ¹⁹	GOSL	—	..	New England Fuel and Transportation Co., Inc., 11, Devonshire Street, Boston (Mass.)	P G	300, 600	—	0.40	Great Britain
Everett KZT ^{9 101}	KZI	300	..	Charles R. McCormick & Co., 1, Drumm Street, San Francisco (Cal.)	P G	300, 450, 600	—	0.40	United States of America
Everett KUQR ²	KUQR	200	..	U.S. Shipping Board, Washington (D.C.)	P G	300, 600	—	0.40	United States of America
Everglades ¹⁰⁸	WQEE	200	..	U.S. Shipping Board, Washington (D.C.)	P G	300, 600	—	0.40	United States of America
Evergreen City ¹⁰⁸	KUNJ	—	..	U.S. Shipping Board, Washington (D.C.)	P G	300, 600	—	0.40	United States of America
Everilda ¹⁹	ZYC	145	..	—	P G	300, 600	—	0.40 ⁸⁷ 0.10 ⁸⁷	Great Britain Great Britain
Everton ¹⁰	GFNZ	—	..	—	P G	300, 600	—	—	—
E. Villendas	PWM	—	..	Navy	P G	—	—	—	Cuba
Evesham ¹⁰	GDOS	—	..	The National Steam Navigation Co., Ltd., of Greece, Athens	P G	300, 600	—	c.10 ⁸⁷ 0.40	Great Britain Greece
Evrof ¹	SWSS	150-200	..	—	P G	300, 600	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
E. W. Sinclair ^{9 131}	KDRN	300	Sinclair Navigation Co., 120, Broadway, New York (N.Y.)	—	P G ..	X	0.40	—	United States of America
Excelsior ¹⁰¹	KKO	300	Southern Pacific Company, Pier 49, North River, New York (N.Y.)	300, 600	P G ..	N	0.40 ¹¹¹	—	United States of America
Exe	GKAC	—	Navy	—	P G ..	—	—	—	Great Britain
Exeter City ¹⁹	BQW	130	—	300, 600	P G ..	X	0.40	—	Great Britain
Exmouth ¹⁸	EOO	145	—	300, 600	P G ..	X	0.40	—	Great Britain
Explorer KIVN ²	KIVN	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Explorer MVV ¹⁹	MVV	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Explorer NAVM ⁹⁹	NAVM	—	Navy	—	P G ..	N	—	—	United States of America
Extremadura EBJ	EBJ	—	Navy	—	O ..	—	—	—	Spain
F.1	OYZ	—	Navy	600	O ³ ..	X	—	—	Denmark
F.2 NXV ⁹⁸	NXV	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
F.2 OWZ ¹	OWZ	—	Navy	600	O ³⁹ ..	X	—	—	Denmark
F.3 ⁹⁹	NXW	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Fabian ¹⁹	GBWS	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Faci	CNJ	120	Ship belonging to the Customs Administration	300	O ..	N	—	—	Morocco
Facto ¹	TSP	100-150	(Armateur) B. Stolt Nielsen, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Fagraas ¹	TSU	100-150	(Armateur) John Erland, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Fagernes ¹⁷	IPQ	140	Società Nazionale di Navigazione, Genova	300, 600	P G ..	X	0.40	—	Italy
Fagervik ¹	SLM	250	Norr Köpings Rederiaktiebolaget, Norr Köping	300, 600	P ..	0800 to 0830 1200 to 1230 2000 to 2030	0.40	4.00	Sweden
Fahrenheit ¹⁰²	NECK	—	—	300, 600	P G ..	N	—	—	United States of America
Fairfax ⁹⁹	NTN	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Fairfield City ^{9 131}	KDPY	300	U.S. Steel Products Co., 39, Church Street, New York	300, 450, 600	P G ..	X	0.40	—	United States of America
Fair Oaks ²	WSM	—	Parr McCormick S.S. Lines, 1, Drumm Street, San Francisco (U.S.A.)	300, 600	P G ..	X	—	—	United States of America

United States of America									
Falko 1	FDVG	—	—	—	—	—	—	—	United States of America
Falko 1	IJT	—	—	—	—	—	—	—	Italy
Falko SFR 1	SFR	250	—	—	—	—	—	0.40	Sweden
Falcon 89	—	—	—	—	—	—	—	—	United States of America
Falken 19	NEKN	—	—	—	—	—	—	0.20 111	Great Britain
Falk 1	EMK	150	—	—	—	—	—	0.40 112	Norway
Falka 1	ATC	400	—	—	—	—	—	0.40	Sweden
Falken 33	—	—	—	—	—	—	—	—	Sweden
Falkland 10	DBS	200	—	—	—	—	—	0.40	Germany
Falls City 19	OHF	200	—	—	—	—	—	0.40	Denmark
Falstria 40	ZNR	130	—	—	—	—	—	0.40	Great Britain
Famaka 19	OZW	200	—	—	—	—	—	0.40	Denmark
Fanad Head 19	GJKR	—	—	—	—	—	—	0.40	Great Britain
Fanad Head 19	YXF	150	—	—	—	—	—	0.40	Great Britain
Fanfare	FBIX	—	—	—	—	—	—	0.05	France
Fanfurum 1	UFIX	200	—	—	—	—	—	0.40 111	France
Fanning 99	NFM	—	—	—	—	—	—	0.20 112	United States of America
Fantes 19	YCC	—	—	—	—	—	—	0.40	Great Britain
Fantome	GABL	—	—	—	—	—	—	0.40	Australian Commonwealth
Faraby 87	KEJV	300	—	—	—	—	—	0.40	United States of America
Faraday 21	GTP	250	—	—	—	—	—	0.40	Great Britain
Farham	GKIB	—	—	—	—	—	—	—	Great Britain
Fargo 9 131	KONL	—	—	—	—	—	—	0.40	United States of America
Farn	LAH	—	—	—	—	—	—	—	Norway
Farnum 1	TYX	150	—	—	—	—	—	0.40	Holland
Farnam 103	KQIE	300	—	—	—	—	—	0.40	United States of America
Farnworth 18	ZXI	190	—	—	—	—	—	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Faro ⁶¹	CSY	100-150	Navy	300, 600	P G	N	0.40	4.00	Portugal
Farquhar ⁶²	NANZ	—	..	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Farragut ⁶³	NVS	—	Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Fan Sang ¹⁹	GFKX	—	..	300, 450, 600	P G	X	0.20 ¹¹¹	—	Great Britain
Fanon	FADY	—	..	300, 800	P G	N	0.40 ¹¹²	—	France
Faustino R. San Pedro ¹	CMD	150	Altos Hornos de Vizcaya, Bilbao	300, 600	P G	N	0.40 ¹¹²	—	Spain
Fasana	IKO	200	Navy	300, 450, 600	P G	N	0.40	4.00	Italy
Fasolt ³²	DYP	—	..	300, 450, 600	P G	X	0.20 ¹¹¹	—	Germany
Fathomer ¹⁰²	NESR	—	..	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Faust ³⁵	DFE	200	Navy	300, 450, 600	P G	X	0.40	4.00	Germany
Fauvette	FAOV	—	..	600, 800	P G	N	0.05	—	France
Faversham	GEZT	—	..	—	P G	N	0.05	—	Great Britain
Favignana ¹⁷	IMV	140	Marittima Italiana Società di Navigazione per Servizi Postali, Genoa	300, 600	P G	X	0.40	—	Italy
Favori	FAHW	—	Navy	300, 800	P G	N	0.05	—	France
Favorite KDNV	KDNV	300	Panama Canal	300, 600	—	—	—	—	United States of America
Favorite KIFG ¹³¹	KIFG	150	Great Lakes Towing Co., Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
Favorite WCF ¹³¹	WCF	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Faxen ¹	SHU	250	Rederiaktiebolaget Transatlantic	300, 600	P.	0600 to 0700 1300 to 1400 1800 to 1900	0.28	2.80	Sweden
Fayette Brown ¹³¹	WQG	200	Harvey H. Brown & Co., Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
F. B. Squire ¹³¹	WFU	150	Jenkins S.S. Co., Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
F. C. Laroche	KDOL	150	City of Baltimore	300, 600	P G	X	0.20 ¹¹¹	—	United States of America
F. D. Asche ¹³¹	KSUA	300	Standard Oil Co. of New York, Incorp., 26, Broadway, New York	300, 600	P G	X	0.40	—	United States of America
Fearless ³	KDRA	200	Ship Owners and Merchants Tugboat Co.	300, 600	P G	X	0.20 ¹¹¹	—	United States of America
Fede ¹⁷	IPF	140	Becchi & Calgarno, Savona	300, 600	P G	X	0.40 ¹¹²	—	Italy
Federal KDWY ⁹⁷	KDWY	300	American Petroleum Company	300, 450, 600	P G	X	—	—	United States of America
Federal WDOO ¹³¹	WDOO	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America

Federica ¹⁷	..	URE	140	(U.S.) Cosulich Società Tristina di Navigazione, Trieste	300, 600	PG	..	X	0.40	—	Italy
Fedora ¹⁷	..	USJ	140	Martinolich Marco U., Nussim-piccolo	300, 600	PG	..	X	0.40	—	Italy
Fei-Ying	..	XPS	—	Navy	—	O	..	—	—	—	China
Feliciara ¹⁹	..	GFWL	100-150	(Armateurs) Dampskibsselskabet Skapet Storborg, Haugesund	300, 450, 600	PG	..	X	0.40	—	Great Britain
Felix ¹	..	TRZ	200	Frassiniet et Cie, Marseilles (Compagnie Marseillaise de Navigation à Vapeur)	300, 600	PG	..	X	0.40	4.00	Norway
Félix Fraissinet ¹	..	FPF	—	Great Eastern Railway Co.	300, 450, 600	PG	..	X	0.40	—	France
Felixstowe ²¹	..	BER	—	Crowell & Thurlow S.S. Co., 131, State Street, Boston (Mass.)	300, 600	PG	..	X	0.10 ⁸⁷ 1.00 ⁸⁷	—	Great Britain
Felix Tausig ²	..	KXZ	—	Compagnie de Navigation Mixte à Vapeur, Marseilles	300, 600	PG	..	X	—	—	United States of America
Félix-Touache ^{26 1}	..	FXF	180	Guaranty Trust Company	300, 600	PG	..	X	0.10	—	France
Feltore ²	..	KFG	300	Navy	300, 600	PG	..	X	0.40	—	United States of America
Fenchurch ¹⁹	..	ENX	250	Angbatsaktiebolaget Ferni, Kristinehamn	300, 600	PG	..	X	0.40	—	Great Britain
Fenella ¹⁹	..	GBEZ	—	Navy	300, 600	O ⁸⁷	..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Fenris ¹	..	OWD	—	Angbatsaktiebolaget Ferni, Kristinehamn	300, 600	P	..	X	—	—	Denmark
Fern ¹	..	SKW	125	Navy	300, 600	P	..	X	0.40	4.00	Sweden
Fernoy	..	GEZV	—	Navy	—	PG	..	—	—	—	Great Britain
Fern ⁴⁹	..	NAFV	—	Navy	300, 600	PG	..	—	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Fernandina ¹⁹	..	OEG	115	—	300, 600	PG	..	—	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Fernando L. de Ibbarra ¹	..	HMM	150	Altos Hornos de Vizcaya, Bilbao	300, 600	PG	..	—	—	—	Spain
Fernao Veloso ⁶¹	..	CSG	100-150	Angbatsaktiebolaget Ferni, Kristinehamn	300, 600	PG	..	—	0.40	4.00	Portugal
Fernebo ¹	..	SJP	250	—	300, 600	P	..	—	0.40	4.00	Sweden
Fernhill ²¹	..	GDJV	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	PG	..	X	0.40	—	Great Britain
Fernmoor ¹⁹	..	GCJV	—	Navigazione Alta Italia, Turin	300, 450, 600	PG	..	X	0.40	—	Great Britain
Fert ¹⁷	..	IYL	190	—	300, 600	PG	..	—	0.40	—	Italy
Fezara ¹⁹	..	GJKS	—	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600	PG	..	X	0.40	—	Great Britain
Ficaria ⁴⁰	..	OYH	150	—	300, 450, 600	PG	..	X	0.40	4.00	Denmark
Fidus	..	KDXB	—	Frank J. Kelly	300, 800	PG	..	—	—	—	United States of America
Fier	..	FBZV	—	Navy	300, 600	PG	..	—	0.05	—	France
Figueira ⁶¹	..	CUG	100-150	Compagnie Générale Transatlantique, Paris	300, 600	PG	..	—	0.40	—	Portugal
Figui ¹	..	UAE	180	—	300, 450, 600	PG	..	—	0.40	4.00	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiogram.	
F. H. Anson ²	VGCQ	30	Albith Power and Paper Co., Ltd., Montreal, P.Q. Standard Oil Co.	300, 600	P	X	—	—	Canada
F. H. Hillman ¹²⁰	KDVK	—	—	300, 600	P G	X	—	—	United States of America
Filey ¹⁹	GDRL	130	—	300, 600	P G	X	0.10	1.00 ⁸⁷	Great Britain
Filippo Artelli ¹⁷	USH	140	Tripovich, D., Trieste	300, 600	P G	X	0.40	—	Italy
Finch ²⁹	NAJP	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Finchley ¹⁹	YIX	135	International Mercantile Marine Co., American Line, 9, Broadway, N.Y.	300, 600	P G	X	0.40 ¹¹²	—	Great Britain
Finland ¹⁰³	KSF	300	—	300, 450, 600	P G	N	0.40	—	United States of America
Finlandia ¹⁰	OYP	300	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Fiona ¹	VHQ	240	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Fionshell ¹⁹	YKO	—	—	300, 600	P G	X	0.40	—	Great Britain
Fioula ⁴⁰	OZK	350	Aktieselskabet det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Firmore ⁵ ¹⁵¹	KXD	200	Guaranty Trust Co.	300, 450, 600	P G	X	0.40	—	United States of America
Firpark ¹⁹	GDNM	—	—	300, 600	P G	X	0.40	—	India
Firozzi ¹⁵	VUI	180	Bombay and Persia Steam Navigation Co., Ltd. (Agents, Turner, Morrison & Co., Ltd., Bombay)	300, 450, 600	P G	X	0.40	—	Great Britain
Firthcliffe ²⁷	KITF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Fishkill ¹⁰³	KULF	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Fishpool ¹⁹	ZWL	150	—	300, 600	P G	X	0.40	—	Great Britain
Fitzroy	GEZW	—	Navy	—	P G	—	—	—	Great Britain
Fiune ¹⁷	IAJ	190	Navigazione Generale Italiana, Genoa	300, 600	P G	X	0.40	—	Italy
Fjeldland ¹⁰	AQAR	5-100	(Armateurs) A/S Fjeldland, H. J. Hansen, Christiansburg	300, 600	P G	X	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Floridan ¹⁸⁴	..	300	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Florinda ¹	..	150	Compañia Barcelonesa de Navegación, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Flowergate ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Flying Breeze ²¹	..	—	Operated by the Alexandra Towing Co., Ltd., Drury Building, Water Street, Liverpool	300, 600	—	X	—	—	Great Britain
Flying Fox	..	—	Navy	—	P G ..	—	—	—	Great Britain*
Flyvefisker ¹	..	—	Navy	600	O ³⁹ ..	—	—	—	Denmark
Foca	..	100-150	Navy	300, 600	O ..	—	—	—	Portugal
Foce (La) ¹⁷	..	140	Odero N. and C., Genoa..	300, 600	P G ..	X	0.40	—	Italy
Föina ¹	..	150-175	(Armateur) Knut Knutsen, O.A.S. Høegsund	300, 600	P G ..	X	0.40	4.00	Norway
Foldenford ¹	..	200-250	(Armateur) A/S den Norske Amerikalnje, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Foo-An	—	Navy	—	O ..	—	—	—	China
Fook Sang ¹⁹	..	—	Navy	300, 450, 600	P G ..	—	0.40	—	Great Britain
Footo ¹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ford NUQJ ¹⁰⁵	..	—	Navy	300, 600	P G ..	N	—	—	United States of America
Ford GFAB	..	—	Navy	—	P G ..	—	—	—	Great Britain
Ford Castle ⁵⁰	..	100	(Armateur) A/S den Norske Amerikalnje, Christiania	300, 600	P G ..	X	0.10 ⁸⁷ 0.40	1.00 ⁸⁷ 4.00	Great Britain
Fördefjord ¹	..	150-200	American-Mediterranean Steamship Company, 5, State Street, New York (N.Y.)	300, 600	P G ..	X	0.40	—	Norway
Fordonian ²	..	150	Forest King Co.	300, 600	P G ..	X	0.40	—	United States of America
Forest King ²	..	300	Navy	300, 425, 600	P G ..	X	0.40	—	United States of America
Forfait	..	—	Compagnie Française de Navigation à Vapeur Cyprien, Fabre & Cie., Marseilles	300, 600	P G ..	X	0.40	—	France
Foria ¹	..	150	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.05 0.40	—	France
Fornose FVF ¹	..	250	Nichola's Manovich Compauia, P.O.	300, 600	P G ..	— ²⁷	0.40	—	France
Fornosa LQF ¹	..	150	—	300, 600	P G ..	N	0.40	4.00	Argentine Republic

Formosa	SDM ¹	SDM	250	300, 800	P	0800 to 0830 1200 to 1230 2000 to 2030 (local time)	0.40	4.00	Sweden
Formosa ¹	250	300, 800	P	..	0.40	4.00	Sweden
Formose ¹	..	FSF	200	300, 450, 600	P G	..	0.40	—	France
Forres	..	GFAC	—	—	P G	..	—	—	Great Britain
Forsete ¹	..	AVW	200-250	300, 600	P G	..	0.40	4.00	Norway
Fort Armstrong ¹⁷	..	KUKF	—	300, 800	P G	..	0.40	—	United States of America
Fort Bragg ²	..	WLH	—	300, 600	P G	..	—	—	United States of America
Fort de Souville ¹	..	FSS	200	300, 600	P G	..	0.40	—	France
Fort de Troyon ¹	..	FSN	200	300, 600	P G	..	0.40	—	France
Fort de Vaux ¹	..	FSV	350	300, 600	P G	..	0.40	—	France
Fort de Douaumont ¹	..	FSU	200	300, 800	P G	..	0.40	—	France
Fort George	..	KDJB	—	300, 800	P G	..	0.40	—	United States of America
Fort Hamilton	..	VRU	—	—	—	..	—	—	Bermuda
Fort McHenry	..	KDXA	—	300, 600	P G	..	—	—	United States of America
Fort Pitt Bridge ¹⁰³	..	KWVB	300	300, 450, 600	P G	..	0.40	—	United States of America
Fort Seward ¹⁰¹	..	KEVJ	200	300, 450, 600	P G	..	0.40	—	United States of America
Fort St. George	..	VRW	—	—	—	..	—	—	Bermuda
Fortuna ²	..	KDWU	150	300, 450, 600	P R	..	—	—	United States of America
Fortune ⁹⁹	..	NEGS	—	300, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Fort Victoria	..	VRV	—	—	—	..	—	—	Bermuda
Fort Wayne ¹⁰¹	..	WDOV	300	300, 450, 600	P G	..	0.40	—	United States of America
Fotinia ¹⁰	..	ZXS	—	300, 600	P G	..	0.40	—	Great Britain
Fotis ¹	..	TGY	100-150	300, 600	P G	..	0.40	4.00	Greece
Fougues	..	FAPK	—	300, 800	P G	..	0.05	—	France
Fourrageur	..	FAQX	—	300, 800	P G	..	0.05	—	France
Fourth Alabama ¹⁰¹	..	KIXJ	300	300, 600	P G	..	0.40	—	United States of America
Fox ⁹⁹	..	NWJ	—	300, 800	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Foxglove	..	GFAD	—	—	P G	..	—	—	Great Britain
Foyie GKID	..	GKID	—	—	P G	..	—	—	Great Britain
Foyie ZUR ¹⁰	..	ZUR	150	300, 600	P G	..	0.40	—	Great Britain
F. Q. Barstow ¹⁰¹	..	KNQ	150	300, 450, 600	P G	..	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radio-telegram.	
Fracas ..	EBHZ	—	Navy	300, 800	P G	N	0.05	—	France
Fragata Sarmiento ¹	LKH	—	Navy	450, 600	O	N	—	—	Argentine Republic
Fram ¹ ..	TFA	100-150	(Armateurs) H. M. Wrangell & Co., A/S Haugesund	300, 600	P G	X	0.40	4.00	Norway
Francaise ¹ ..	FZZ	200	F. Boue, 70, Rue des Carnes, Caen	300, 600	P G	X	0.40	—	France
France FAXN ..	FAXN	—	Navy	300, 800	P G	N	0.05	—	France
France FHF ¹ ..	FHF	400	Compagnie Française de Marine et de Commerce, Paris	300, 600, 1800	P G	X	0.40	—	France
France FTZ ¹ ..	FTZ	400	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	0.40	—	France
France Maru ¹ ..	IAJ	400	Kokusai Kisen Kaisha ..	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Francesca ¹⁷ ..	ITQ	140	Cesulich Societa Triestina di Navigazione, Trieste	300, 600	P G	X	0.40	—	Italy
Francesco Ciampa ¹⁷	IWD	140	Giampa F. S. & F. Rano di Sorento	300, 600	P G	X	0.40	—	Italy
Francesco Furrucio	IHZ	—	Navy	300, 600	P G	X	—	1.00 ⁸⁷	Italy
Frances Duncan ¹⁸	ZWG	—	—	300, 600	P G	X	0.10 ⁸⁷	—	Great Britain
Francis ¹⁹ ..	MDG	170	—	300, 600	P G	X	0.40	—	Great Britain
Francisca Uravain ¹	TON	100	Victoriano Uravain, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Francisco ¹⁸ ..	GCSW	250	—	300, 600	P G	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—	Great Britain
Francis-Garnier ..	FBXG	—	Navy	300, 800	P G	N	0.05	—	France
Francol ¹ ..	BKX	—	—	300, 600	P	X	—	—	Great Britain
Frank Billings ¹²¹	KDXM	150	Pioneer S.S. Company	300, 600	P G	X	0.10 ¹¹⁹	—	United States of America
Frank Delmas ¹ ..	FWK	—	Delmas Frères, La Rochelle	—	P G	X	0.40	—	France
Frankenfels ¹⁹	BRI	—	—	300, 600	P G	X	0.40	—	Great Britain
Franklin FAKL	FAKL	—	—	300, 800	P G	N	0.05	—	France
Frank G. Drum ²	KDQZ	300	Associated Oil Co., 55, New Montgomery St., San Francisco (Cal.)	300, 600	P G	X	0.40	—	United States of America
Frank H. Buck ¹⁰¹	WTO	300	Associated Oil Co., 55, New Montgomery St., San Francisco (Cal.)	300, 600, 1,800	P G	X	0.40 ¹²²	—	United States of America
Frankier ¹⁹	YHF	145	—	300, 600	P G	X	0.40	—	Great Britain
Franklin County ¹⁰⁰	KOTV	300	U.S. Shipping Board, Washington D.C.	300, 600	P G	X	0.40	—	United States of America

Franklin KDPK ^{9 131} Franklin K. Lane ^{9 131}	KDPK KDLH	300 300	Gallatin Navigation Co. Pan-American Petroleum and Trans- port Co., Incorp.	300, 450, 600 300, 600	P G .. P G ..	X X	0.40 0.40	United States of America United States of America
Frank Parish ¹⁹	MUL	120	—	300, 600	P G ..	X	0.40	Great Britain
Franz Ferdinand ²	VUY	15	—	300, 450, 600	O G ..	X	0.40 ³⁸	India
Franziska ³⁵	DBH	200	—	300, 600	P G ..	X	0.40	Germany
Fratella Bianchi ¹⁷	DBJ	200	—	300, 600	P G ..	X	4.00	Germany
Fratelli Cairoli	IER	190	—	300, 600	P G ..	X	0.40	Italy
Frauenfels ³⁵	IJC	200	—	300, 600	P G ..	X	—	Italy
Fred Baxter ²	DBK	200	—	300, 600	P G ..	X	0.40	Germany
Fred Baxter ¹⁹	WOG	200	—	300, 600	P G ..	X	0.40	United States of America
Fred Cleaves ¹⁹	GFJC	—	—	300, 450, 600	P G ..	X	0.40	Great Britain
Freden ¹	AQE	150-175	—	300, 600	P G ..	X	0.40	Norway
Fredensbro ¹	OIZ	150	—	300, 600	P G ..	X	— ³⁸	Denmark
Fredericia ¹	OYT	200	—	300, 450, 600	P ..	X	— ³⁸	Denmark
Frederick ^{9 131}	NJS	—	—	300, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Frederick Ewing ^{9 131}	WNQ	150	—	300, 450, 600	P G ..	X	0.40	United States of America
Frederick R. Kellogg ^{9 131}	WIQ	300	—	300, 450, 600	P G ..	X	0.40	United States of America
Frederick VIII ⁴⁰	OZL	350- 1,000	—	300, 450, 600, 800, 1,800	P G ..	N	0.40	Denmark
Frederiksborg ⁴⁰	OHJA	200	—	300, 450, 600, 800	P G ..	X	0.40	Denmark
Fred J. Talbot ⁴⁹	NIGR	—	—	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Frednes ¹	AQAK	150-175	—	300, 600	P G ..	X	0.40	Norway
Fredrik Larsen ¹⁰	GDFP	—	—	300, 600	P G ..	X	0.40	Great Britain
Fred W. Weller ^{9 131}	KNY	300	—	300, 450, 600	P G ..	X	0.40	United States of America
Freedom ^{9 131}	KFW	150	—	300, 600	P G ..	N	0.40	United States of America
Freeman ^{9 131}	WMM	200	—	300, 450, 600	P G ..	X	0.40	United States of America
Freemantle ¹	UCQ	300	—	300, 600	P G ..	X	0.40	France
Freeport Sulphur No. 1 ^{9 131}	KRA	300	—	300, 450, 600	P G ..	X	0.40	United States of America
Freeport Sulphur No. 2 ^{9 131}	KRG	200	—	300, 450, 600	P G ..	X	0.40	United States of America
Freeport Sulphur No. 5 ^{9 131}	KUMK	300	—	300, 450, 600	P G ..	X	0.40	United States of America
Freeport Sulphur No. 6 ^{9 131}	KUNP	300	—	300, 450, 600	P G ..	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-tele-gram.	
Fregate II ¹	..	180	Compagnie Lorientaise de Chalutage, Lorient	300, 600	P G	X	0.40	—	France
Freienfels ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Freifeld ³⁵	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Frène	..	—	Navy	300, 800	P G	X	0.05	—	France
Freshwater ¹⁹	..	170	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Great Britain
Fresno ^{9 131}	..	150	—	300, 600	P G	X	0.40	—	United States of America
Fret	..	—	Navy	600	O ³⁹	—	—	—	Holland
Frey ¹	..	400	(Armateur) Nils A. Orum, Christiania	300, 600	P G	X	0.40	4.00	Norway
F. R. Hazard ^{9 131}	..	150	Pioneer S.S. Company	300, 600	P G	X	0.10 ¹⁰	—	United States of America
Fricka ³⁵	..	200	—	300, 450, 600	P G	X	0.40	—	Germany
Frida Horn ¹	..	300	Leroux & Heuzey, 27, Rue Buffon, Rouen	300, 600	P G	X	0.40	—	France
Frieda Fahrnen ¹⁹	..	150	—	300, 600	P G	X	0.40	—	Great Britain
Frieda KFF ³⁷	..	150	Union Sulphur Co., 82, Beaver St., New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Frieda OHW ⁴⁹	..	200	Aktieselskabet Dampskibsselskabet Senta, Copenhagen	300, 450, 600, 800	P G	X	0.40	—	Denmark
Friedland ¹	..	200	Victor Leclaire Huret, Boulogne-sur-Mer	300, 600	P G	X	0.40	4.00	France
Friedrich Franz IV ³⁵	..	200	—	300, 400, 600	P G	—	0.40	—	Germany
Frielinghaus ³⁵	..	200	—	300, 600	P G	X	—	4.00	Germany
Friesland DFI ³⁵	..	120	Bureau Wijsmuller, Scheepvaart Transport en-Zeeleepvaart Maatschappij, Rotterdam	300, 450, 600	P G	X	0.40	4.00	Germany
Friesland PIH ¹	..	125	Navy	300, 600	P G	X	0.40	—	Holland
Frimaire	..	—	—	300, 800	P G	X	0.05	—	France
Frinton ⁷¹	..	—	Great Eastern Railway Co.	300, 450, 600	P G	X	0.10 ³⁷	—	Great Britain
Friso	..	—	Navy	600	O ³⁹	—	—	—	Holland
Fritthof	..	—	—	—	O	—	—	—	Norway
Fritthof L ¹	..	150	Navy (Armateur) Alf. Monsen, Tonsberg	300, 450, 600	P G	X	0.40	4.00	Norway
Fritiof	..	250	Salvage Ship belonging to the Göteborgs Bogsering's Aktiebolag, Gothenburg	300, 600	P	X	0.40	4.00	Sweden

Fritz Hugo Stinnes ³³	DFH	200	—	(Armateurs) Bugge and Olsen, Larvik	—	300, 600	P G	—	—	4.00	Germany
Fritz Strauss ³²	DKZ	200	—	—	—	300, 600	P G	—	—	4.00	Germany
Fritzøe ¹ ..	TPC	300	—	—	—	300, 600	P G	—	—	4.00	Norway
Frobisher ..	GECP	—	—	Navy	—	—	P G	—	—	—	Great Britain
Frøde ⁴⁰ ..	—	—	—	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	—	—	—	—	—	—	Denmark
Frøner ¹ ..	TTK	150-200	—	(Armateur) Fearnley & Eger, Christiania	—	300, 600	P G	—	—	4.00	Norway
Frondeur ..	FAZV	—	—	Navy	—	300, 800	P G	—	—	—	France
Froya ..	LBD	—	—	Navy	—	—	O	—	—	—	Norway
Fuchs ¹ ..	AFV	—	—	Navy	—	—	O	—	—	—	Germany
Fucllière ..	IIO	—	—	Navy	—	—	—	—	—	—	Italy
Fueloil ⁹ 131	KUQB	—	—	Pan-American Petroleum and Transport Co., 1015, Security Building, Los Angeles (Cal.)	—	300, 600	P G	—	—	0.20	United States of America
Fuenteventura ¹	EFY	150	—	Interinsular Canaries	—	300, 600	P G	—	—	3.00	Spain
Fuji ¹ ..	JUC	—	—	Navy	—	—	O	—	—	—	Japan
Fuji Maru ¹	JFF	400	—	Kawasaki Zosenjo	—	300, 600	P G	—	—	—	Japan
Fuku Maru ¹	JFC	400	—	Taisho Kisen Kaisha	—	300, 600	P G	—	—	—	Japan
Fukukai Maru ¹	JFJ	400	—	Nippon Kaibun Kaisha	—	300, 600	P G	—	—	—	Japan
Fukuyo Maru JKV ¹	JKV	400	—	Nippon Kaibun Kaisha	—	300, 600	P G	—	—	—	Japan
Fukuyo Maru JTH ¹	JTH	400	—	Toyo Kisen Kaisha	—	300, 600	P G	—	—	—	Japan
Fulgurant ..	FAGU	—	—	Navy	—	300, 800	P G	—	—	—	France
Fuller ⁹⁹ ..	NFG	—	—	Navy	—	300, 600	P G	—	—	—	United States of America
Fullerton ⁷¹	BKZ	—	—	Operated by the Denaby Shipping and Commercial Co., Ltd., 29, Great St. Helens, London, E.C.3	—	300, 600	P G	—	—	—	Great Britain
Fulmar ¹⁹ ..	GBNW	150	—	—	—	300, 600	P G	—	—	—	Great Britain
Fultala ¹⁹ ..	GDC	210	—	—	—	300, 600	P G	—	—	—	Great Britain
Fulton NZD ⁶²	FAUO	—	—	Navy	—	300, 800	P G	—	—	—	France
Fulton NZD ⁶²	NZD	—	—	—	—	300, 600	P G	—	—	—	United States of America
Funchal ⁶¹ ..	CSF	100-150	—	Navy	—	300, 600	P G	—	—	—	Portugal
Ferretux ..	FAOE	—	—	Navy	—	600, 800	P G	—	—	—	France
Ferrous ..	GEXL	—	—	Navy	—	—	P G	—	—	—	Great Britain
Fürst Bülow ³⁵	DFB	200	—	Navy	—	300, 600	P G	—	—	—	Germany
Fushimi ¹ ..	JWJ	—	—	Nippon Yusen Kaisha (Japan Mail Steamship Company)	—	300, 600, 1,800	O	—	—	—	Japan
Fushimi Maru ¹	JFM	450	—	—	—	—	P G	—	—	—	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiogram.	
Fuslier ¹⁰	OPF	100-150	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Fuso ¹	JGN	—	Navy	—	—	—	—	—	Japan
Fynd ¹	LHA	60	(Armateur) Hvalfangelsskapet Nordhavet A/S, Tonsberg	300, 600	P G	X	0.40	4.00	Norway
Fylgia	SBM	—	Navy	—	O ⁸⁹	—	—	—	Sweden
G 2 ⁸⁹	NXZ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
G 3 ⁸⁹	NYA	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
G 4 ⁸⁹	NYB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
G 7 ¹	AKV	—	Navy	—	O	N	—	—	Germany
G 8 ¹	AFW	—	Navy	—	O	N	—	—	Germany
G 10 ¹	AFX	—	Navy	—	O	N	—	—	Germany
G 11 ¹	AFY	—	Navy	—	O	N	—	—	Germany
G 34	IFX	—	Navy	—	O	N	—	—	Germany
Gaasterdijk ¹	TXV	200	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland Amerika Lijn, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Gaasterland ¹	PYK	200	Koninklijke Hollandische Lloyd, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Gabo ¹	VZBK	120	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Gaboon ¹⁹	ZMK	170	—	300, 600	P G	0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Gabriella ¹	FHG	200	Fourny et Cie., Boulogne-sur-Mer	300-600	P G	X	0.40	—	France
Gael ¹⁰	GFRQ	—	—	300, 600	P G	X	0.10 ⁸² 1.00 ⁸²	—	Great Britain
Gaelic Prince ¹⁹	XIW	160	—	300, 600	P G	X	0.40	—	Great Britain
Gaffney ⁸⁷	KICR	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America

Country	City	Line	Ship	Tonnage	Agent	Company	Port of Origin	Port of Destination	Rate	Remarks
Galicia	Galicia	Galicia	Galicia	100-150	CSL	Galicia	Galicia	Galicia	4.00	Portugal
Galicia	Galicia	Galicia	Galicia	230	MOU	Galicia	Galicia	Galicia	0.40	Great Britain
Gainsborough	Gainsborough	GFAK	Gainsborough	—	—	—	—	—	—	—
Garsopp	Garsopp	GCZB	Garsopp	—	—	—	—	—	—	—
Galathea	Galathea	KEQR	Galathea	300	—	—	—	—	—	—
Galathea	Galathea	OVG	Galathea	—	—	—	—	—	—	—
Galdames	Galdames	ECX	Galdames	150	—	—	—	—	—	—
Galea	Galea	CXB	Galea	150	—	—	—	—	—	—
Galesburg	Galesburg	WGAE	Galesburg	300	—	—	—	—	—	—
Gallia	Gallia	CLL	Gallia	—	—	—	—	—	—	—
Gallia	Gallia	DLK	Gallia	400	—	—	—	—	—	—
Gallia	Gallia	UPG	Gallia	140	—	—	—	—	—	—
Gallia	Gallia	GII	Gallia	200	—	—	—	—	—	—
Galileo	Galileo	IKK	Galileo	—	—	—	—	—	—	—
Galileo	Galileo	IIV	Galileo	300	—	—	—	—	—	—
Gallia	Gallia	OYD	Gallia	250	—	—	—	—	—	—
Gallia	Gallia	SJV	Gallia	—	—	—	—	—	—	—
Gallic	Gallic	MVO	Gallic	150	—	—	—	—	—	—
Gallic	Gallic	ONG	Gallic	150-200	—	—	—	—	—	—
Gallic	Gallic	DGY	Gallic	200	—	—	—	—	—	—
Gallic	Gallic	HLN	Gallic	100	—	—	—	—	—	—
Galston	Galston	GJNM	Galston	—	—	—	—	—	—	—
Galston	Galston	GUU	Galston	250	—	—	—	—	—	—
Galston	Galston	GBNV	Galston	180	—	—	—	—	—	—
Galston	Galston	KDQE	Galston	300	—	—	—	—	—	—
Galston	Galston	NGD	Galston	—	—	—	—	—	—	—
Galston	Galston	GCZF	Galston	—	—	—	—	—	—	—
Galston	Galston	ZNF	Galston	—	—	—	—	—	—	—
Galston	Galston	ESH	Galston	170	—	—	—	—	—	—
Galston	Galston	ZEH	Galston	150	—	—	—	—	—	—
Galston	Galston	GCOV	Galston	—	—	—	—	—	—	—
Galston	Galston	NEZR	Galston	—	—	—	—	—	—	—
Galston	Galston	CSU	Galston	100-150	—	—	—	—	—	—
Galston	Galston	GMJR	Galston	125	—	—	—	—	—	—
Galston	Galston	GWJ	Galston	—	—	—	—	—	—	—
Galston	Galston	JEP	Galston	200	—	—	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type)	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Gannet ¹⁸ ..	NIJX	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ganymedes ¹ ..	PYI	150	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Garada ¹⁹ ..	GCMS	—	Navy	300, 600	P G ..	X	0.40	—	Great Britain
Garavoglia ¹⁹ ..	IBBL	—	—	—	—	X	—	—	Italy
Garbeta ¹⁹ ..	GCYX	—	—	—	—	X	0.40	—	Great Britain
Garden Island Base.	VKQ	—	Navy	300, 600	P G ..	—	—	—	Australian Commonwealth
Gardenia BFO ¹⁹ ..	BFO	135	Liburnica Società Anonima di Navigazione à Vapeur, Lussim-piccio	600	O ..	X	—	—	Great Britain
Gardenia UVO ¹⁷ ..	UVO	140	—	300, 600	P G ..	X	0.40	—	Italy
Garfield ⁹ ¹³¹ ..	WQOE	200	Grace S.S. Company, Inc., 7 Han- over Square, New York (N.Y.)	300, 600	P G ..	X	0.20	—	United States of America
Gargoyles ⁹ ¹³¹ ..	KDPE	300	Vacuum Oil Co., 61, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Garibaldi IUA ¹⁷ ..	IUA	190	Transatlantica Italiana Società di Navigazione, Rome	300, 600	P G ..	N	0.40	—	Italy
Garibaldi KROU ⁹ ¹³¹ ..	KROU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Garibaldi LJY ¹⁷ ..	LJY	—	Navy	450, 600	O ..	N	—	—	Argentine Republic
Garigliano ¹⁷ ..	IGH	—	Navy	—	—	—	—	—	Italy
Garni ¹⁷ ..	LBC	—	Navy	—	O ..	—	—	—	Norway
Garmula ¹⁹ ..	GCZJ	150	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	—	Great Britain
Garret ¹ ..	PIN	—	Compagnie de Navigation Sud- Atlantique, Paris	300, 600	P G ..	X	0.40	4.00	Holland
Garonna ¹ ..	FSG	300	Navy	300, 600	P G ..	X	0.40	—	France
Garonne FAKG	FAKG	—	Compagnie Générale Transatlan- tique, Paris	300, 800	P G ..	N	—	—	France
Garonne FTG ¹ ..	FTG	350	—	300, 600	P G ..	X	0.05 0.40	—	France
Garth Castle ¹⁹ ..	MOP	250	—	300, 600	P G ..	N	0.40	—	Great Britain
Garthland ¹⁹ ..	GJXN	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Garryvale ¹⁹ ..	ELH	160	—	300, 600	P G ..	X	0.40	—	Great Britain
Gatson ¹⁹ ..	MOV	220	—	300, 600	P G ..	N	0.40	—	Great Britain
Gastouier ¹⁹ ..	OFU	120	—	300, 600	P G ..	X	0.40	—	Great Britain
Gastlight ¹⁹ ..	GDSZ	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Gastner ¹⁷ ..	UPE	140	Lloyd Triestino Società di Navi-	300, 600	P G ..	X	1.00 ⁸⁷ 0.40	—	Italy

General Leman ¹	WZX	30	300, 600	Government, Washington (D.C.)	O	—	—	United States of America
General Miffen ²	GDLC	250	300, 600	—	P G	0.40	—	Great Britain
General Milne ¹⁹	GBMR	—	600	Government, Washington (D.C.)	P G	0.40	—	United States of America
General Napier ¹⁹	WZR	30	300, 600	—	P G	—	—	United States of America
General Nathaniel Greene ²	KPF	250	300, 600	Panama R.R. Co., 24, State St., New York (N.Y.)	P G	0.40	—	United States of America
General O. H. Ernst ⁹⁷	—	—	—	—	—	—	—	—
General R. B. Ayres ²	WYAL	100	600	Government, Washington (D.C.)	O	—	—	United States of America
General R. H. Jackson ²	WYAW	20	400	Government, Washington (D.C.)	O	—	—	United States of America
General Richard Arnold ²	WYAY	30	600	Government, Washington (D.C.)	O	—	—	United States of America
General R. N. Batchelder ²	WZW	30	600	Government, Washington (D.C.)	O	—	—	United States of America
General Robert Anderson ²	WYAH	30	600	Government, Washington (D.C.)	O	—	—	United States of America
General Robert W. Swartout ²	WYAU	25	425	Government, Washington (D.C.)	O	—	—	United States of America
General Royal T. Frank ²	WYAA	100	—	Government, Washington (D.C.)	O	—	—	United States of America
General San Martin ³⁸	DEW	350	300, 450, 600	Government, Washington (D.C.)	P G	0.40	4.00	Germany
General S. B. Holabird ²	WYAV	300	600	Government, Washington (D.C.)	O	—	—	United States of America
General Serret ¹	HRO	200	300, 600	Transport Maritimes de l'Etat	P G	0.40	—	France
General S. M. Mills ²	WYAB	200	600	Government, Washington (D.C.)	O	—	—	United States of America
General Timethy Pickering ²	WYBQ	200	800, 1,200	Government, Washington (D.C.)	O	—	—	United States of America
General Wallace F. Randolph ¹⁰²	WYBG	—	300, 600	—	P G	—	—	United States of America
General W. C. Gorgas ²	KIP	250	300, 600	Panama R.R. Co., 24, State St., New York (N.Y.)	P G	0.20	—	United States of America
General William M. Graham ²	WYBD	—	—	Government, Washington (D.C.)	—	—	—	United States of America
General Zaragoza ¹	XCA	—	600	Navy	O	—	—	Mexico
Generale Arimondi	IHJ	—	—	Navy	—	—	—	Italy
Generale Cantore	IBBF	—	—	Navy	—	—	—	Italy
Generale Casino	IBBG	—	—	Navy	—	—	—	Italy
Generale Chinotto	IBBH	—	—	Navy	—	—	—	Italy
Generale Montanari	IBBI	—	—	Navy	—	—	—	Italy
Generale Papa	IBBJ	—	—	Navy	—	—	—	Italy
Generale Pettiti ¹⁷	UUY	140	300, 600	Navigazione Generale Gerolimich & Comp., Società in Azioni, Trieste	P G	0.40	—	Italy
Generale Prestinari	IBBK	—	—	Navy	—	—	—	Italy
Gene Crawley ^{9 101}	KQF	300	300, 450, 600	Sinclair Gulf Corporation, 120, Broadway, New York (N.Y.)	P G	0.40	—	United States of America
Genesee KIDL ²	KIDL	300	300, 450, 600	Arthur L. Crowley	P G	—	—	United States of America
Genesee MIT ¹⁹	MIT	135	300, 600	—	P G	0.40	—	Great Britain
Genevieve ¹	UKH	200	300, 600	Société Dieppoise d'Armement à la Pêche	P G	0.40	—	France
Genmel Maru ¹	JBN	400	300, 600, 1,800	Uyenishi Kisen Kaisha	P G	0.40	—	Japan
Genoa Maru ³⁵	JSL	400	300, 600	Nippon Yusen Kaisha	P G	0.40	—	Japan
Genoveva Fierros ¹	HML	150	300, 600	Compañia Naviera Fierros S.A., Oriedo	P G	0.30	3.00	Spain

Shipboard Stations—Continued

Name	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country
							Per Word.	Minimum per Radiotelegram.	
Geo. E. Badger ⁸⁹	NUJG	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Geo. H. Jones ^{9 131}	KIPS	300	Standard Oil Company of New Jersey, Incorp. 26, Broadway, New York (N.Y.), Pioneer Building, Seattle (Wash.)	300, 600	P G	X	0.40	—	United States of America
Geo. L. Harvey	KDET	—	Joseph Kiddall, 214, Pioneer Building, Seattle (Wash.)	—	—	—	—	—	United States of America
Georg Stage ¹	OZY	100	Aktieselskabet Georg Stages Minde, Copenhagen	300, 600	P	X	— ³⁸	—	Denmark
Georg Zelek ²³	DGZ	200	Garland S.S. Corporation	300, 450, 600	P G	X	0.40	4.00	Germany
George Allen ^{9 131}	KUNF	200	American Bauxite Co., Harrison Building, Philadelphia (Pa.)	300, 450, 600	P G	X	0.40	—	United States of America
George B. Mackenzie ^{9 131}	KUNT	300	Pan-American Petroleum and Transport Co., Inc., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	X	0.20	—	United States of America
George W. Barnes ^{9 131}	KMUI	—	Magnolia Petroleum Co.	300, 600	P G	X	0.40	—	United States of America
George C. Greer ²	KOQL	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.20	—	United States of America
George E. Weed ⁹⁷	KDIM	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
George G. Henry ^{9 131}	WIT	150	Pan-American Petroleum and Transport Company, Inc., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
George Pierce ⁹⁷	KDLT	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
George Ward ²¹	GDYJ	300	Commercial Cable Co., Ltd.	300, 450, 600	P	X	0.40	—	Great Britain
George Washington ⁹⁹	NEC	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
George Washington KDCL ⁹⁷	KDCL	300-800	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
George Washington LPQ ¹	LFQ	150-200	(Armateurs) Peter Olsen, Christiania	300, 600	P G	X	—	—	United States of America
Georgette ¹	ULH	200	Compagnie Havraise de Navigation, 25, Rue de Faubourg, St. Honoré, Paris	300, 450, 600, 800	P G	X	0.40	4.00	Norway
Georgia NGF ⁹⁹	NGF	—	Navy	300, 600	P G	X	0.40	—	France
Georgia KUR ¹²³	KUR	300	Texas Company, Port Arthur	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
						X	0.40	—	United States of America

Country	Company	Year	Value	Share	Country
Georgia	WFA	1903	300, 600	X	United States of America
Georgia	KOVP	1903	300, 450, 600	X	United States of America
Georgia	KETX	1903	300, 600	X	United States of America
Georgia	FQG	1903	300, 600	N	France
Georgia	WTEI	1903	300, 450, 600	X	United States of America
Georgia	USL	1903	300, 600	X	Italy
Georgia	GABM	1903	300, 600	X	Australian Commonwealth
Georgia	GDIK	1903	300, 600	X	Great Britain
Georgia	SLB	1903	300, 600	X	Sweden
Georgia	XEQ	1903	300, 600	X	Great Britain
Georgia	FJI	1903	300, 600	X	France
Georgia	GFSY	1903	300, 600	X	Great Britain
Georgia	GBCV	1903	300, 600	X	Great Britain
Georgia	KDVC	1903	300, 600	X	United States of America
Georgia	SME	1903	300, 600	X	Sweden
Georgia	URI	1903	300, 600	X	Italy
Georgia	AVI	1903	300, 600	X	Norway
Georgia	GCDP	1903	300, 600	X	Great Britain
Georgia	VGNF	1903	300, 600	X	Canada
Georgia	IIF	1903	300, 600	X	Italy
Georgia	VRM	1903	300, 600	X	Gibraltar
Georgia	GVLB	1903	300, 600	X	Gibraltar
Georgia	GVLB	1903	300, 600	X	Gibraltar
Georgia	GEXW	1903	300, 600	X	Gibraltar
Georgia	JDEA	1903	300, 600	X	Japan
Georgia	IXK	1903	300, 600	X	Italy
Georgia	ICK	1903	300, 600	X	Norway
Georgia	UTY	1903	300, 600	X	Italy
Georgia	CUN	1903	300, 600	X	Portugal
Georgia	XIJ	1903	300, 600	X	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radio-telegram.	
Gilgal ¹	VJK	240	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	Australian Commonwealth
Gillhausen ³³	DGL	200	—	300, 600	P G	X	0.40	4.00	Germany
Gillis ²⁹	NERR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Glinier ⁸⁹	NERB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Gilwen Manor ¹⁹	BGL	—	—	300, 600	P G	X	0.40	—	Great Britain
Gilwen Park ¹⁹	YBA	—	—	300, 600	P G	X	0.40	—	Great Britain
Gina ¹	FPS	200	Dutasta, 15, Rue de l'Université, Paris	450, 600	P G	X	0.40	—	France
Ginyo Maru ¹	IBLA	400	Toyō Kisen Kaisha	300, 600	P G	N	0.40	—	Japan
Giovanna Florio ¹⁷	UOT	140	Florio (V. and I.), Rome	300, 600	P G	X	0.40	—	Italy
Glove ¹⁷	IMG	140	Co-operativa Garibaldi Società Anonima fra Lavatori del Mare, Genova	300, 600	P G	X	0.40	—	Italy
Giralda	EBI	—	Navy	—	Q	—	—	—	Spain
Giroflee ¹	FSX	100	Société des Pêcheries Maritimes, 33, Rue Brizeux, Lorient	450, 600	P G	0900 to 1000 1600 to 1700	0.40	—	France
Gitano ¹⁹	GFOC	—	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Giuliana	IGN	—	Cosulich, Società Triestina di Navigazione, Trieste	300, 600	P G	X	0.40	—	Italy
Giulia ¹⁷	URG	140	Peirce Brothers, Naples	300, 600	P G	X	0.40	—	Italy
Giulia Peirce ¹⁷	UUD	140	Navy	—	—	—	0.40	—	Italy
Giulio Cesare ¹⁷	IHE	—	—	—	—	—	—	—	Italy
Giulio Cesare ¹⁷	IXR	140	Vitulli Montabuli, G. & Po., Genoa	300, 600	P G	X	0.40	—	Italy
Giulio Cesare ¹⁷	UPH	270	Navigazione Generale Italiana, Genoa	300, 600	P G	N	0.40	—	Italy
Giuseppina Ilardi ¹⁷	IOJ	190	Ilardi Ernesto & F., Messina	300, 600	P G	X	0.40	—	Italy
Giuseppe Missori ¹⁷	IJO	—	Navy	—	—	—	—	—	Italy
Giuseppe Verdi ¹⁷	IUV	270	Transatlantica Italiana Società di Navigazione, Rome	300, 450, 600	P G	N	0.40	—	Italy
Givenchy CFN ²	CFN	100	Government Station, Department Marine & Fisheries, Ottawa, Ont.	300, 600	O	X	—	—	Canada

Gladysbe ²⁷	300	U.S. Mexican Oil, 25, Beaver St., New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Gladiator	—	Navy	300, 800	P G	..	N	0.05	France
Gladiator AZG ¹	150	—	600	P G	..	0700 to 1000	0.15	Estonia
						1300 to 1600		
						1800 to 2000		
						(mean time of East Europe)		
Gladiator YER ¹⁹	—	Navy	300, 600	P G	..	X	0.40	Great Britain
Glaive	—	—	300, 800	P G	..	N	0.05	France
Glamorganshire ¹⁰	—	—	300, 800	P G	..	N	0.05	Great Britain
Glanbrydan ¹⁹	110	—	300, 600	P G	..	X	0.40	Great Britain
Glasgow Maru ¹	500	Kokusai Kisen Kaisha	300, 600	P ²⁵	..	0800 to 1100	—	Japan
						1400 to 1700		
						2000 to 2400		
Glassford ¹⁹	—	Ocean Steamship Co., Ltd.	300, 600	P G	..	X	0.40	Great Britain
Glaucous ²¹	250	—	300, 450, 600	P G	..	X	0.40	Great Britain
Glen Gower ¹⁹	—	—	300, 600	P G	..	X	0.10 ²⁷	Great Britain
Glen Head ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glen Uisk ¹⁹	—	—	300, 450, 600	P G	..	X	0.10 ²⁷	Great Britain
Glen Ridge ^{9 121}	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	United States of America
Glen White ^{9 121}	300	Castner, Curran & Bullitt, Incorp., 40, Central St., Boston (Mass.)	300, 600	P G	..	X	0.40	United States of America
Glenade ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glenamoy ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
						0600 to 0800		
						0900 to 1200		
						1400 to 1800		
						2000 to 2200		
Glenapp ²¹	250	Siemens, Bros. & Co., Ltd., Woolwich, London, S.E. ¹⁸	300, 450, 600	P G	..	X	0.40	Great Britain
Glenariffe ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glenavy ¹⁰	—	—	300, 600	P G	..	X	0.40	Great Britain
Glenbeg ¹⁰	350	—	300, 450, 600	P G	..	X	0.40	Great Britain
Glenbridge ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glencoe	—	—	—	P G	..	N	—	Newfoundland
Glenegyle ¹²	160	—	300, 600	P G	..	X	0.40	Great Britain
Glendaniel ¹⁰³	300	Charlton B. Hibbard	300, 450, 600	P G	..	X	0.20	United States of America
Glendola ^{9 121}	200	Glendola S.S. Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Glendoyne ¹⁰³	200	Glendoyne S.S. Corporation, 120, Broadway, New York (N.Y.)	300, 600	P G	..	X	0.40	United States of America
Glendun ¹⁹	—	—	300, 450, 600	P G	..	X	0.10 ²⁷	Great Britain
Glenearn ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Gleneden ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glenfalloch	200	Ho Hong Steamship Co., Ltd., Singapore	300, 600	P G	..	X	0.40	Straits Settlements
Glenfinlas ¹⁹	—	—	300, 600	P G	..	X	0.40	Great Britain
Glenfinnan ²¹	125	Great Lakes Transportation Co., Midland, Ont.	300, 600	P	..	X ²⁷	0.40	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Glenariff ¹⁹	GFVY	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Glenarry ¹⁹	GCXD	350	—	300, 450, 600	P G	X	0.40	—	Great Britain
Glenorm Castle ¹⁹	MOS	250	—	300, 600	P G	N	0.40	—	Great Britain
Gleniffer ¹⁹	MUE	200	—	300, 600	P G	X	0.40	—	Great Britain
Glenisla ²¹	CKB	300	Great Lakes Transportation Co., Midland, Ont.	300, 600	P G	— ²⁷	0.40	—	Canada
Glenluce ²¹	GCWK	250	Siemens, Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Glenluss ¹⁹	GBMN	—	—	300, 600	P G	X	0.40	—	Great Britain
Glenlyon ²¹	VBVJ	200	Great Lakes Transportation Co., Midland, Ont.	300, 600	P	— ²⁷	0.40	—	Canada
Glenmoor ¹⁹	YIE	145	—	300, 450, 600	P G	X	0.40	—	Great Britain
Glenmorag ¹⁹	YEP	—	—	300, 600	P G	X	0.40	—	Great Britain
Glenmount ²¹	VGJQ	250	Great Lakes Transportation Co.	300, 600	P	— ²⁷	0.40	—	Canada
Glenogle ¹⁹	GDQW	260	—	300, 600	P G	X	0.40	—	Great Britain
Glenorchy ²¹	XVB	200	Great Lakes Transportation Co., Midland, Ont.	300, 600	P	— ²⁷	0.40	—	Canada
Glenpark ¹⁹	XEB	140	—	300, 600	P G	X	0.40	—	Great Britain
Glenpool ^{9 121}	KOH	300	Standard Oil Co. of New Jersey, Inc., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Glensanda ¹⁹	ENV	—	—	300, 600	P G	X	0.40	—	Great Britain
Glenshane ¹⁹	XIO	—	—	300, 600	P G	X	0.40	—	Great Britain
Glenshee ²¹	VEW	200	Great Lakes Transportation Co., Midland, Ont.	300, 600	P	— ²⁷	0.40	—	Canada
Glenstoy ¹⁹	YDF	135	—	300, 600	P G	X	0.40	—	Great Britain
Glentara ²¹	GCWQ	250	Siemens, Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Glentworth ²⁰	GDWN	350	—	300, 450, 600	P G	X	0.40 ⁸²	—	Great Britain
Glint ¹⁹	XFP	100	—	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Glitra ¹⁹	XFW	145	—	300, 600	P G	X	0.40	—	Great Britain
Glofield ¹⁹	YGX	—	—	300, 600	P G	X	0.40	—	Great Britain
Gloire	FAIG	—	Navy	300, 800	P G	N	0.05	—	France
Gloimen ¹⁹	LBB	—	Navy	—	O	—	—	—	Norway
Gloria ²	TJG	500	Compañia Naviera Vascongada Bilbao	300, 600	P G	N	0.30	3.00	Spain
Gloria de Larrinaga ¹⁹	ELA	—	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Gonzenheim ³⁵	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Goodspeed ¹⁰³	..	200	U. S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Goodwin ¹⁹	..	—	—	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Gootland ¹	..	150	Koninklijke Hollandsche Lloyd, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Goorkha ¹⁹	..	230	—	300, 600	P G	N	0.40	—	Great Britain
Gorala ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Gorbea Mendi ¹	..	150	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Gordon Castle ¹⁹	..	170	—	300, 600	P G	N	0.40	—	Great Britain
Gordon GJBR ²¹	..	250	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G	X	0.40	—	Great Britain
Gorgona KDNZ	..	200	Panama Canal	300, 600	—	—	—	—	United States of America
Gorgona NDJ ³⁸	..	—	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Gorgone	..	—	Navy	300, 800	P G	N	0.40 ¹¹²	—	France
Goristan ¹⁹	..	—	—	300, 600	P G	X	0.05	—	Great Britain
Gorm ⁴⁶	..	—	—	300, 600	P G	—	0.40	—	Denmark
Gorontalo ¹	..	150	Aktieselskabet det Forenede Dampskib-Selskab, Copenhagen	300, 450, 600, 800	—	—	—	—	Holland
Goree ¹⁰³	..	200	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 450, 600	P G	X	0.40	4.00	United States of America
Gorredijk ¹	..	200	U. S. Shipping Board, Washington (D.C.)	300, 450, 600, 800	P G	X	0.40	—	Holland
Gosau Maru ¹	..	400	Nederlandsche-Amerikanische Stoomvaart Maatschappij, Amerika Lijn, Rotterdam	300, 450, 600, 800	P G	—	0.40	4.00	United States of America
Gota	..	—	Kokusai Kisen Kaisha	300, 600	P G	—	0.40	—	Holland
Gotland ¹	..	250	Navy	—	P G	—	0.40	—	Japan
Gota	..	—	Amptartysocktelbolaget Tirfing, Gothenburg	300, 600	O ³⁹	—	—	—	Sweden
Gota	..	—	—	—	P	—	0.40	4.00	Sweden
Gotenhof ³⁵	..	200	—	300, 600	P G	X	0.40	4.00	Germany
Gotha ³⁵	..	200	—	300, 600	P G	N	0.40	4.00	Germany
Gotha ³⁵	..	—	Operated by Siemens, Bros. & Co.,	300, 450, 600	P G	X	0.40	—	Great Britain

Gothicstar ¹⁹	YVR	170	—	Red Star Line, Antwerp	300, 600	P G	..	1400 to 1800	—	Great Britain
Gotland ¹⁰	ORG	150-200	—	Rederiktiebolaget Gottfriid,	300, 600	P G	..	2000 to 2200	0.40	Belgium
Gotfridf ¹	SKD	150	Langsde	—	300, 600	P	..	0800 to 0830 1230 to 1300 (local mean time)	0.40	Sweden
Goyaz ¹⁵	DGP	60	—	—	300, 600	P G	..	1900 to 1930	0.40	Germany
Gracchus ¹⁹	DGO	200	—	—	300, 600	P G	..	X	0.40	Germany
Grace Dollar ²¹	VKX	300	—	—	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 s 0.40 s	Australian Commonwealth
Graciafield ¹⁹	ODX	120	—	—	300, 600	P G	..	X	0.40	Great Britain
Gracia ¹⁹	OTG	100-150	Compagnie Royal Belge, Argentina, Antwerp	—	300, 600	P G	..	X	0.40	Belgium
Gracia ¹⁹	ENE	140	—	—	300, 600	P G	..	X	0.40	Great Britain
Gracia ¹⁹	KRB	150	Peninsular and Occidental S.S. Company Exchange Building, New Haven (Conn.)	—	300, 600	P G	..	N	0.40	United States of America
Graenou ¹⁹	KRV	150	Eastern S.S. Lines, India Wharf, Boston (Mass.)	—	300, 450, 600	P G	..	N	0.40	United States of America
Graenou ¹⁹	WREU	300	Baltimore S.S. Company	..	300, 450, 600	P G	..	X	0.40	United States of America
Graenou ¹⁹	VZG	150	—	—	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 s 0.40 s	Australian Commonwealth
Goyaz ¹⁵	SSC	150	Lloyd Brasileiro, Rio de Janeiro	—	300, 600	P G	..	N	0.40	Brazil
Gracchus ¹⁹	GDF	180	—	—	300, 600	P G	..	X	0.40	Great Britain
Grace Dollar ²¹	VGCJ	250	Canadian Robert Dollar Company, Ltd., Vancouver, B.C.	—	300, 600, 800	P G	..	N	0.40	Canada
Graciafield ¹⁹	OCY	130	—	—	300, 600	P G	..	X	0.40	Great Britain
Gracia ¹⁹	GFDR	—	—	—	300, 450, 600	P G	..	X	0.40	Great Britain
Gracia ¹⁹	ZFD	160	—	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Graeuse ¹⁹	FBGS	—	Navy	.. .. .	300, 800	P G	..	N	0.05	France
Grado ¹⁹	IKT	—	Navy	.. .. .	—	—	—	—	—	Italy
Gracia ¹	SJU	250	Rederiktiebolaget Svenska Lloyd, Gothenburg	—	300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	Sweden

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiotelegram.	
Graham ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Grainton ¹⁹	..	150	(Armateurs) A/S Red Odffjell,	300, 600	P G ..	X	0.40	—	Great Britain
Gran ¹	175-200	Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Granatiere	..	—	Navy	—	P G ..	X	—	—	Italy
Grand Haven ¹³¹	..	—	Grand Trunk Car Ferry Line, Milwaukee (Wis.)	300, 600	P G ..	—	0.20	—	United States of America
Grand Remorquer ¹	..	20	State Navy Administration	300, 450, 600	O ..	N	—	—	Belgium
Grande Gaard ¹	150-200	(Armateur) Henrik Ostervold, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Grandlieu ¹	..	350	Compagnie Nantaise de Navigation à Vapeur, Nantes	300, 600	P G ..	X	0.40	—	France
Grandon ¹	..	200	—	300, 450, 600	P G ..	X	0.40	4.00	Germany
Grangemouth ¹⁹	..	170	—	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Grangepark ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Grangesberg ¹	..	250	Trafikaktiebolaget Grangesberg Oxelsund, Stockholm	300, 600	P ..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	Sweden
Granicos ¹	..	150-200	Embricos Bros., Athens ..	300, 600	P G ..	X	0.40	4.00	Greece
Grania ⁶¹	..	100-150	—	300, 600	P G ..	X	0.40	4.00	Portugal
Granli ¹	100-125	(Armateurs) Olsen & Ugelstad, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Grantley ¹⁹	..	125	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Grantly Castle ¹⁹	..	210	—	300, 600	P G ..	N	0.40	—	Great Britain
Graro ²	100	Compañia Trasmediterranea, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Graphic ¹⁹	..	160	—	300, 600	P G ..	X	0.10 ⁸	1.00 ⁸	Great Britain
Gratia DCA ³⁵	..	200	—	300, 450, 600, 800	P G ..	X	0.40	4.00	Germany
Gratia KIGP ¹³¹	..	300	Braddock Navigation Co. ..	300, 450, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
					P G ..	X	0.40	—	France

Shipboard Stations

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Greta ⁸⁵	DGB	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Gretchen Müller ⁸⁵	DGP	125	—	300, 600	P G	X	0.40	4.00	Germany
Greina	GFAM	150-200	Navy	300, 600	P G	X	—	—	Great Britain
Grey County ¹	TSZ	150-200	(Armateur) Willy C. Gilbert, Bergen	300, 600	P G	X	0.40	4.00	Norway
Greyhound ¹⁹	GFPZ	—	—	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Greyhound ¹⁹	GDPL	—	—	300, 600	P G	X	0.40	—	Great Britain
Greystoke Castle ¹⁹	ZYM	145	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
G. R. Gray ²¹	CJT	200	Lake Superior Paper Company, Sault Ste. Marie, Ont.	300, 600, 800	P G	— ⁸⁷	0.40	—	Canada
Grib	LBI	—	Navy	—	O	N	—	—	Norway
Gridley ⁹⁸	NEMX	—	Navy	300, 600	P G	—	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Griffon VGCT ³²	VGCT	200	Coastwise Steamship and Barge Co., Ltd., Vancouver, B.C.	300, 600	P	— ²⁷	0.20	—	Canada
Griffith ⁹⁷	KDIL	200	Universal S.S. and Barge Co.	300, 425, 600	P G	X	0.20	—	United States of America
Grigna ¹⁰	ZPT	145	—	300, 600	P G	X	0.40	—	Great Britain
Grille ³³	DGI	200	—	300, 600	P G	Wed. and Sat. 1200 to 1400 1600 to 1800 2000 to 2200 Thur. & Sun. 0900 to 0200 0200 to 0200 0200 to 0200 1200 to 1400 1600 to 1800 2000 to 2200	0.40	4.00	Germany
Grillo (El) ¹⁹	GFRV	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Gro ¹	DGM	200	(Armateurs) A.S. Jacob	300, 600	P G	X	0.40	4.00	Germany
Gro ¹	TQA	150-200	R. Olsen, Bergen	300, 600	P G	X	0.40	4.00	Norway
Grodno ¹⁹	GBVY	140	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	Great Britain
Grot Sereyni Bela ¹	UFZ	200	—	300, 600	P G	X	0.40	—	France
Groningen ¹	HEB	200	Bureau Wijsmuller, Scheepvaart, Transport en Zeeleverant	300, 600	P G	X	0.40	4.00	Holland

Gründ. OWF ¹ Grootendijk ¹	OWF TXW	— 200	Navy Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland - Amerika Lijn, Rot- terdam	600 300, 450, 800, 800	O ³⁹ P G	X X	— 0.40	— 4.00	Denmark Holland
Grossherzogin Elisabeth ³⁸ Grotius ¹	DGE PFI	200 350	— Stoomvaart Maatschappij Neder- land, Amsterdam	300, 600 300, 800	P G P G	X 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40 0.40	4.00 4.00	Germany Holland
G. S. Allyn ²	KDZY	150	C. E. Davis Packing Company, Fleefon (Va.)	300, 450, 800	P R	X	—	—	United States of America
Grino ¹ Grissgott ³⁵ Guadalquivir ¹	PAU DGR EDF	— 200 150	Navy Naviera Guadalquivir, S.A., Sevilla	600 300, 600 300, 800	O ³⁹ P G P G	— X N	— 0.40 0.30	4.00 3.00	Holland Germany Spain
Guadimir ¹ Guadiana ¹ Guajara ³⁶ Guanabara	TMV CTH PVU PVH	200 100-150 250	Naviera Guadalquivir, S.A., Sevilla Lloyd Brasileiro, Rio de Janeiro Companhia Lloyd Nacional, Rio de Janeiro	300, 800 300, 600 300, 800 300, 600	P G O P G P G	N — N N	0.30 — 0.40 0.40	3.00 — — —	Spain Portugal Brazil Brazil
Guantanamo ¹⁰⁸	KWN	250	N.Y. and Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 450, 800	P G	N	0.40	—	United States of America
Guarany ¹	LQG	135	Nicolás Milhanovich, Ltd., Buenos Aires	300, 600	P G	N	0.40	4.00	Argentine Republic
Guararapes ¹⁸	PUT	150	Campanhia de Navegação Bahiana, São Salvador (Bahia)	300, 600	P G	N	0.40	—	Brazil
Guaratuba HPX ¹ Guaratuba PUE Guardian ² Guardia Nacional ¹ Guardsman ¹⁰³	HPX PUE WGX LIT KIVX	300 150 300 — 150	Transports Maritimes de l'Etat Lage & Irmãos All American Cable Company Navy T. A. Scott Company, Incorp., New London (Conn.)	300, 600 300, 800 300, 600 450, 600 300, 600	P G P G P O P G	X X X N X	0.40 0.40 — — 0.20	— — — — —	Brazil Brazil United States of America Argentine Republic United States of America
Guarina ¹ Guaro ¹⁰⁴	KDZS WJV	— 150	P. E. Fansler U.S. Shipping Board, Washington (D.C.)	300, 600	P G	— X	— 0.40	— —	United States of America United States of America
Guaruja ¹	FVI	400	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G	X	0.40	—	France
Guatemala ¹⁹ Gudmundra ¹	MWM SDL	220 250	Rederaktiebolaget Fredrika Kranfors Aktieselskabet Dampskibsselskabet Torm, Copenhagen	300, 600 300, 800 300, 600	P G P	N 0800 to 0830 1900 to 1930	0.40 0.40	— 4.00	Great Britain Sweden
Gudrun ⁴⁰	OIW	200	Aktieselskabet Dampskibsselskabet Svendborg, Svendborg	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Gudrun Mærsk ⁴⁰	OGL	200	Société des Armateurs Français, Paris	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Guebwiller ¹	FDC	200	—	300, 600	P G	X	0.40	—	France
Guepe ¹ Guemica ¹	FBNZ TLT	— 150	Navy Compania Auxiliar Marítima, Bilbao	600, 800 300, 600	P G P G	N N	0.05 0.30	— 3.00	France Spain
Guerrero ⁷¹	GJCL	—	Operated by Cayzer, Irvine & Co., Ltd., 2, St. Mary Axe, London, E.C.3.	300, 600	P G	X	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge—Francs.		Country.
							Per Word.	Minimum Radiotelegram.	
Guetaria ¹	ECI	150	Sociedad Naviera Elcano S., Sebastian	300, 600	P G ..	N	0.30	3.00	Spain
Guéthary ..	FKG	—	Compagnie des Chargeurs Français, Plisson et Cie., Paris	—	P G ..	X	0.40	—	France
Gueydon ..	FABG	—	Navy	300, 800	P G ..	N	0.05	—	France
Guglielmo Peirce ¹²	UPX	190	Scuola Americana, Società di Navigazione ed imprese Marittime, Naples	300, 450, 600	P G ..	N	0.40	—	Italy
Guernsey ¹	ATB	150-175	(Armateur) Wilh. Wilhelmssen, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Guiana ²¹ ..	CJJ	250	Canada S.S. Lines, Ltd., Montreal, P.Q.	300, 600, 800	P G ..	N	0.40	—	Canada
Guichen ¹ ..	FKN	250	Compagnie des Chargeurs Réunis, 1, Boulevard Malesherbes, Paris	300, 450, 600, 800	P G ..	X	0.40	—	France
Guido ¹⁹ ..	GDNV	175	—	300, 600	P G ..	X	0.40	—	Great Britain
Guilford Castle ¹⁹	MPZ	220	—	300, 600	P G ..	N	0.40	—	Great Britain
Guillem Sorolla ¹ ..	TOI	200	Compañia Trasmediterranea, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Guimba ²⁷ ..	WJIE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Guinevere ..	KDUP	—	Edgar. Palmer	300, 600	P R ..	X	—	—	United States of America
Gurpuzcoa ¹ ..	CXZ	150	Compañia de Navegacion, Mundaca	300, 600	P G ..	N	0.30	3.00	Spain
Guldborgsund ¹ ..	OWG	—	Navy	600	O ³⁹ ..	X	—	—	Denmark
Gulfaxe ⁴⁵ ..	OICA	200	Aktieselskab Dampskibsselskabet Primula, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Gulfcoast ¹⁰³ ..	KUE	150	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Gulfking ¹⁰³ ..	KDNO	200	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Gulfland ¹⁰³ ..	KUD	300	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Gulflight ¹⁰³ ..	KUA	200	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Gulfmaid ² ¹³¹ ..	KUB	200	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 450, 600	P G ..	X	0.40	—	United States of America
Gulf of Mexico ² ¹³¹ ..	KUC	150	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 450, 600	P G ..	X	0.40	—	United States of America
Gulfoll ¹⁰³ ..	KTG	200	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 450, 600	P G ..	X	0.20	—	United States of America
							0.40	—	United States of America

Gulf of Suez ¹⁰	120	KEF	Sinclair Navigation Co., 120, Broadway, New York (N.Y.)	300, 600	P G	X	0.40	Great Britain
Gulport ⁹ Jan	200	KREE	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Gulf Prince	200	KDRB	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Gulf Queen ¹⁰³	300	KVS	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Gulfstar ¹⁰³	200	KDEB	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 450, 600	P G	X	0.40	United States of America
Gulfstream ¹⁰³	200	KTB	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Gulftrade ¹⁰³	200	KOVb	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
Gulfloss ¹ ..	200	TFG	Eimskipafjelag Islands, Reykjavik	300, 450, 600	P G	X	0.40	Iceland
Gulmar ¹	150	SIG	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	X	0.40	Sweden
Gulnare ² ..	100	VBZ	Government Department of Marine and Fisheries	300, 600	O	X	—	Canada
Gundreda ¹⁹	60	GCXM	(Armateur) Olaf Orvig, Bergen	300, 600	P	X	—	Great Britain
Gunnar Heiberg ¹	200	TRN	(Armateur) Johan Eliassen, Bergen	300, 600	P G	X	0.40	Norway
Gunny ¹	100-150	TRV	(Armateur) U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	Norway
Guston Hall ¹⁰³	300	KICV	—	300, 600	P G	X	0.40	United States of America
Günther Russ ³⁵	200	DOD	—	300, 600	P G	X	0.40	Germany
Guria ¹⁹ ..	—	GCZD	—	300, 600	P G	X	0.40	Great Britain
Gur ¹	100	HNC	Zagadi y Compañia, Bilbao	300, 600	P G	X	0.40	Spain
Gurth ¹ ..	300	AUB	(Armateur) Det Selmerske Rederi, Trondhjem	300, 600	P G	X	0.40	Norway
Gurupy ² ..	200	PPG	Companhia Commercial E. Nave- gação, Rio de Janeiro	300, 500, 600	P G	N	0.40	Brazil
Gustav Fischer ³⁵	200	DGV	—	300, 600	P G	X	0.40	Germany
Gustavsholm ¹ ..	250	SIH	Aktiebolaget Svenska Amerika- Mexico Linien, Gothenburg	300, 600	P	X	0.40	Sweden
Gustav V	—	SCO	Navy	—	O ³⁵	—	—	Sweden
Gustav Vigeland ¹	400	LWC	(Armateur) Olaf Orvig, Bergen	300, 450, 600	P G	X	0.40	Norway
Gustave-Zede	—	FAGZ	Navy	600, 800	P G	N	0.05	France
Gutenfels ³⁵	200	DBR	—	300, 600	P G	X	0.40	Germany
Guthfield ³⁰	200	DAK	—	300, 450, 600	P G	X	0.40	Germany
Guyane ¹ ..	200	FQY	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	N	0.40	France
Gwalla ¹⁰²	—	WUAD	—	300, 600	P G	N	—	United States of America
Gwinn ⁹⁹ ..	—	NAGX	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Gwladys ¹⁹	EQK	140	—	300, 600	P G	X	0.40	—	Great Britain
Gwmeric ¹⁹	EPZ	180	—	300, 600	P G	X	0.40	—	Great Britain
Gwynnead ¹⁹	BJW	145	—	300, 600	P G	X	0.40	—	Great Britain
Gyp ¹⁹	BFS	135	—	300, 600	P G	X	0.40	—	Great Britain
Gypsum Prince ¹⁰²	WUAC	—	—	300, 600	P G	N	—	—	United States of America
H 1	CAU	—	Navy	—	—	—	—	—	Chile
H 2 CAV	CAV	—	Navy	—	—	—	—	—	Chile
H 2 ⁹⁹ NYD	NYD	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 3 CAV	CAW	—	Navy	—	—	—	—	—	Chile
H 3 ⁹⁹ NYE	NYE	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 4 CAX	CAX	—	Navy	—	—	—	—	—	Chile
H 4 ⁹⁹ NEQM	NEQM	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 5 CAV	CAV	—	Navy	—	—	—	—	—	Chile
H 5 ⁹⁹ NETG	NETG	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 6 CAZ	CAZ	—	Navy	—	—	—	—	—	Chile
H 6 ⁹⁹ NEFC	NEFC	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 7 ⁹⁹	NESJ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 8 ⁹⁹	NELN	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
H 9 ⁹⁹	NEVB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Haakon VII ¹	LDL	160	(Armateurs) Det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 450, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	2.00	Norway
Haarlem ¹	TWR	200	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Haafeld ⁹⁹	NEZV	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Haddon ¹⁰³	KIRN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Hadnot ⁹⁷	KOGP	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America

Hagen	KOQC	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Hagen DHW ³⁵	DHW	—	300, 600	P G	X	Germany
Hagno ¹	PXC	Maatschappij Zeevaart, Rotterdam	300, 450, 600, 800	P G	X	Holland
Hagood	KOQD	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Hague Maru ¹	JHX	Osaka Shosen Kaisha (Osaka Mer- cantile Steamship Company)	300, 600	P G	o800 to 1100 1400 to 1700 2000 to 2400	Japan
Hahatonka ⁹⁷	KUPF	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Hahira ⁹ 131	KUZC	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Hai-Chew	XSW	Navy	—	O	—	China
Hai-Chi	XSC	Navy	—	O	—	China
Hai-Shen	XSP	Navy	—	O	—	China
Hai-Tien	XST	Navy	300, 600	P G	X	China
Hai-Yung	XSV	Navy	—	O	—	China
Haida ¹²⁸	NITF	—	300, 600	P G	N	United States of America
Haitown ¹⁰	ZDA	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	X	Great Britain
Hati FGH ¹	FGH	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	France
Hatti KUFK ⁹ 131	KUFK	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Haien ⁴⁰	OWH	Navy	600	O ⁹⁰	X	Denmark
Hakata Maru ¹	JPK	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	o800 to 1100 1400 to 1700 2000 to 2400	Japan
Hakodate Maru ¹	JMB	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	o800 to 1100 1400 to 1700 2000 to 2400	Japan
Hakone Maru ¹	JHG	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	N	Japan
Hakushika Maru ¹	JBX	Tatsuuma Kisen Kibushiki Kaisha	300, 600, 1,800	P G	o800 to 1100 1400 to 1700 2000 to 2400	Japan
Halbroon	FALJ	Navy	600, 800	P G	N	France
Halcyon ³	KZL	Yacht belonging to Dutree W. Flint,	300, 450, 475, 600	P G	X	United States of America
Hale ⁹⁹	NACL	19, Snow St., Providence (R.I.) Navy	300, 600	P G	N	United States of America
Haleakala ¹⁰³	KORL	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Haleric ¹⁹	YHA	—	300, 600	P G	X	Great Britain
Halesius ¹⁹	YGF	—	300, 600	P G	X	Great Britain
Half Moon KDTY ⁹ 131	KDTY	Gordon Woodbury	300, 600	P G	—	United States of America
Half Moon KUVX ⁹ 131	KUVX	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	United States of America
Haliartus ¹⁹	FAHL	Navy	300, 800	P G	N	France
Halicor ¹	GBQJ	Vve Cantfagret & Fils, Boulogne- sur-Mer	300, 600	P G	X	Great Britain
	UKF		300, 600	P G	X	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimump Radio-tele-gram.	
Halziones ¹⁹	GCKX	—	—	300, 600	P G	X	0.40	—	Great Britain
Halbjorg ¹	LFA	100-150	(Armateur) P. Kleppe, Bergen	300, 600	P G	X	0.40	4.00	Norway
Halle ¹⁰	DHE	350	—	300, 600	P G	X	0.40	4.00	Germany
Halfrid ¹	LFT	600	(Armateur) P. Kleppe, Bergen	300, 600	P G	X	0.40	4.00	Norway
Halgard ¹	LGP	75-100	(Armateur) P. Kleppe, Bergen	300, 600	P G	X	0.40	4.00	Norway
Hallgrim ¹	AVE	400	(Armateur) P. Kleppe, Bergen	300, 600	P G	X	0.40	4.00	Norway
Hallgyn ¹⁰	AWS	200-250	(Armateurs) Brunsgaard Kiøstenuud & Co., Drammen	300, 600	P G	X	0.40	4.00	Norway
Hallmoor ¹⁹	YIR	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Hallside ¹⁹	GCMP	170	—	300, 600	P G	X	0.40	—	Great Britain
Halocrates ¹⁹	BUK	—	—	300, 600	P G	X	0.40	—	Great Britain
Halo GCLX ¹⁹	GCLX	130	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Halo KDCE ⁹⁷	KDCP	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Halse ¹	AWR	200	(Armateurs) Bugge & Co, Mandal	300, 600	P G	X	0.40	4.00	Norway
Halsey ⁹⁷	KDDR	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Halway ⁹⁷	KDFQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Hambleton Range ¹⁹	YPJ	190	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Hambro ¹	KDSH	—	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Hamburg AHM ¹	AHM	—	Navy	—	O	N	—	—	Germany
Hamburg DHM ⁹⁵	DHM	400	—	300, 600	P G	X	0.40	4.00	Germany
Hamburg Maru ¹	JHR	400	Osaka Shosen Kaisha, (Osaka Mercantile Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Hamel ⁹⁵	DME	200	—	300, 450, 600, 800	P G	X	0.40	4.00	Germany
Hamelin ¹	FBHA	—	Navy	300, 800	P G	N	0.05	—	France
Hamer ⁹⁷	KDTN	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	X	0.40	—	United States of America
Hamilton NIFL ⁹⁹	NIFL	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America

Hamlet ²³	LGD	160	Norfolk (Va.) (Armateurs) Bruusgaard, Kiøsterud & Co., Drammen	300, 600	P G	X	0.20	2.00	Norway
Hamlin TMM ¹	TMM	200	Manuel Allende, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Hannas ³⁷	KDTJ	300	—	300, 600, 1,800	P G	X	—	—	United States of America
Hannarshus ⁴⁰	OGDA	350	Aktieselskabet Dampskibsselskabet Danebrog, Copenhagen	300, 450, 800	P G	X	0.40	4.00	Denmark
Hammonia ³⁵	DUF	400	—	300, 450, 800	P G	N	0.40	4.00	Germany
Hamptden ⁹ ¹²¹	WXUI	300	Coastwise Transportation Co., 40, Central Street, Boston (Mass.)	300, 450, 800	P G	X	0.40	—	United States of America
Hamptden Roads ⁹ ¹²¹	KESR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Hampstead ¹⁹	EZT	135	—	300, 600	P G	X	0.40	—	Great Britain
Hampstead Heath ¹⁰	EIE	180	—	300, 600	P G	X	0.40	—	Great Britain
Hanaski Maru ¹	JCF	200	Nippon Yusen Kaisha, (Japan Mail Steamship Co.)	300, 600	P G	X	0.40	—	Japan
Hanaui ³⁵	DHP	200	—	300, 600	P G	X	0.40	4.00	Germany
Hancock ⁴⁹	NHI	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Hancock County ⁹ ¹²¹	KORT	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Handicap	ATG	200-250	(Armateurs) Bruusgaard, Kiøsterud & Co., Drammen. (The accounts are settled by the owners)	300, 600	P G	X	0.40	4.00	Norway
Hankow Maru ¹	JNN	400	Kokusai Kisen Kaisha	300, 600	P G	X	0.40	—	Japan
Hanley ⁸⁷	KDIF	500	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Hanna Nielsen ²³	LGD	200-250	(Armateur) B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	4.00	Norway
Hannah ¹⁹	ZYA	300	—	300, 600	P G	X	0.40	—	Great Britain
Hanawa	KDFR	—	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Hannibal ⁹³	NGU	—	Navy	300, 600	P G	N	0.20 ¹ 0.40 ¹	—	United States of America
Hannington Court ¹⁹	LUB	150	—	300, 600	P G	X	0.40	—	Great Britain
Hannover AHV ¹	AHV	—	Navy	—	O	N	—	—	Germany
Hannover DHV ³⁵	DHV	350	Deutsch Australische Dampschiffs- Gesellschaft, Hamburg	300, 600	P G	X	0.40	4.00	Germany
Hannover DIH ⁴⁵	DIH	200	Norddeutscher Lloyd, Bremen	300, 600	P G	N	0.40	4.00	Germany
Hannover ¹⁰³	KOJK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Hans ³⁵	DHS	200	—	300, 600	P G	X	0.40	4.00	Germany
Hans Mærsk ⁴⁰	OYE	200	Rederiet A. P. Möller, Copenhagen	300, 450, 600	P G	X	0.40	4.00	Denmark
Hans Taysen ⁴⁰	—	—	—	—	—	—	—	—	Denmark
Hansa DHX ³⁵	DHX	350	Aktieselskabet Dampskibsselskabet Jutlandia, Copenhagen	300, 600	P G	N	0.40	4.00	Germany
Hansa SHO ¹	SHO	150	Angfartsaktiebolaget, Gotland, Visby	300, 600	P G	N	0.28	2.80	Sweden

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumpower Radio-telegram.	
Hantonia ¹⁹	..	170	Lang, L. V., 8, French Bund, Shanghai	300, 600	P G ..	N	0.10 ⁸³	1.70 ⁸²	Great Britain
Hao-Ou ⁴¹	..	—	Aktieselskabet det Forenede Dampskib-Selskab, Copenhagen	—	—	—	0.40	—	China
Harald ⁴⁰	..	—	Navy	—	—	—	—	—	Denmark
Harald DHD ³⁵	..	200	Navy	300, 450, 600	P G ..	X	0.40 ¹⁰¹	4.00	Germany
Haraden ³⁹	..	—	Navy	300, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Harald Haarfaagre	..	—	(Armateurs) Aktieselskabet	—	O	—	—	—	Norway
Haraldshaug ¹	..	300	Mercator, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Harald SIE ¹	..	100	Salvage Ship belonging to Göteborgs Bogserings Aktiebolaget, Gothenburg	300, 600	P	0800 to 0830 1130 to 1200 1630 to 1700 (local mean time)	0.28	2.80	Sweden
Harbin Maru ¹	..	450	Osaka Shosen Kaisha, (Osaka Mercantile Steamship Company)	300, 600	P G ..	N	0.40	—	Japan
Harbor Tog No. 61 ¹⁰⁸	..	—	—	300, 600	P G ..	N	—	—	United States of America
Harbor Tug No. 74 ⁹⁹	..	—	—	300, 600	P G ..	N	—	—	United States of America
Harburg ³⁸	..	400	—	300, 600	P G ..	X	0.40	4.00	Germany
Hardanger ¹⁰	..	125	—	300, 600	P G ..	X	0.40	—	Great Britain
Hardenburg ¹	..	200	Stoomboot Maatschappij Hille- gersberg, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Hardi	..	—	Navy	300, 800	P G ..	N	0.05 ¹¹¹	—	France
Harding ⁴⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹²	—	United States of America
Hardinge ²	..	500	Royal India Marine	450, 600, 800, 2,000-3,000	O ⁸	X	0.40 ¹¹³	—	India
Hardwicke Grange ¹⁰	..	—	—	300, 450, 600	P G ..	X	0.40 ⁸⁸	—	—
Harebell	..	—	Navy	—	P G ..	—	0.40	—	Great Britain
Haresfield ¹⁹	..	160	Société Anonyme les Chaulniers de La Rochelle, La Rochelle	300, 600	P G ..	X	0.40	—	Great Britain
Harle ¹	..	150	—	300, 450, 600	P G ..	X	0.40	—	France
Harlow ¹⁹	..	120	—	300, 600	P G ..	X	0.40	—	Great Britain
Harleywood ¹⁹	..	140	—	300, 600	P G ..	X	0.40	—	Great Britain
Harmonius ¹⁹	..	150	Northern Navigation Co., Ltd., Sarnia, Ont.	300, 600	P G ..	X	0.40	—	Great Britain
Harmonic ²¹	..	200	—	300, 600	P G ..	—	0.40	—	Canada

Shipboard Stations

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Ship	Company	Port	Class	Speed	Passengers	Mail	Country
Harold B. Nye ^{9 131}	Pioneer S.S. Company	150	KDNS	150	300, 600	X	United States of America
Harold Casper ¹⁹	Dollar S.S. Line, Ltd., 880, Hasting St., Vancouver, B.C.	150	XXY	150	300, 600	P G	Great Britain
Harold Dollar ¹²	Petroleum Transport Co., 1015, Security Building, Los Angeles (Cal.)	200	VXY	200	300, 600	P G	Canada
Harold Walker ^{9 131}	Navy	300	WIX	300	300, 450, 600	X	United States of America
Harpenden	John Harrison & Sons, Co., Ltd., Owensound, Ont.	—	GKIL	180	300, 600	P G	Great Britain
Harpley ¹⁹	Armateur P. Kleppe, Bergen	100	EXC	100	300, 600	P	Great Britain
Harrison	Navy	150-175	VFY	150	300, 600	X ²⁷	Canada
Harriet ¹	Sinclair Gulf Corp., 120, Broadway, New York (N.Y.)	300	AVP	300	300, 600	X	Norway
Harrow	Lukenbach Steamship Company	300	GKIM	300	300, 450, 600	X	Great Britain
Harry Farnum ^{9 131}	American Steamship Company	300	KQA	300	300, 600	X	United States of America
Harry Luckenbach ⁹⁷	Navy	300	KIGS	300	300, 525, 600	N	United States of America
Harry Yates ¹²⁸	Navy	150	KDUB	150	300, 600	X	United States of America
Hart ⁹⁸	U.S. Shipping Board, Washington (D.C.)	145	NEV	145	300, 600	X	United States of America
Hartfield ¹⁹	Navy	300	EVL	300	300, 450, 600	X	Great Britain
Hartford KOSX ^{9 131}	Navy	300	KOSX	300	300, 600	X	United States of America
Hartford NGV ⁹⁹	Hartwood ¹⁹	—	NGV	—	300, 600	N	United States of America
Hartside ¹⁹	Hartwood ²	145	MJX	145	300, 600	X	United States of America
Hartwood ²	Hartwood ²	130	ZNJ	130	300, 600	X	Great Britain
Haruna ¹	Navy	200	KEVR	200	300, 600	X	Great Britain
Haruna Maru JPH ¹	Navy	—	JGX	—	300, 600	O	United States of America
Haruna Maru JPH ¹	Navy	200	JPH	200	300, 600	P G	Japan
Haruna Maru JIN ¹	Nippon Yusen Kaisha (Japan Mail Steamship Company)	450	JIN	450	300, 600	P G	Japan
Harunasan Maru ¹	Mitsui Bussan Kaisha	400	JBGA	400	300, 600	P G	Japan
Harvard ¹⁰¹	Los Angeles Steamship Company	300	WRH	300	300, 600	P G	United States of America
Harve Maru JDL ¹	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300	JDL	300	300, 600	P G	Japan
Harvester KDHC ¹²⁸	Texas S.S. Company, 17, Battery Place, New York (N.Y.)	200	KDHC	200	300, 600	P G	United States of America
Harvester WCR (The) ^{9 131}	International Harvester Company, Duith (Minn.)	150	WCR	150	300, 450, 600	X	United States of America
Harvey H. Brown ^{9 131}	Casner, Curran & Bullitt, Incorp., 40, Central St., Boston (Mass.)	150	WQE	150	300, 600	X	United States of America
Hashidate ¹	Navy	—	JUO	—	—	O	Japan
Haslehurst ^{9 131}	U.S. Shipping Board, Washington (D.C.)	300	KOXB	300	300, 450, 600	X	United States of America
Hassel ¹	Armateurs A/S Red, Odffell Bergen	150-200	TQC	150	300, 600	X	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumer Radiogram.	
Hastings	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Hastings County ¹	..	200-250	(Armateur) Lorentz W. Hansen, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Hastnal ¹¹⁴	..	—	National Oil and Transport Co., Orange (Texas)	300, 600	P G ..	X	—	—	United States of America
Hatarana ¹⁰	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Hatzen ¹⁰	..	300	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Hatchle ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hathaway ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hatimura ¹⁰	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Hatipara ¹⁰	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Hatkholia ¹⁰	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Hatteras ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Hattie Luckenbach ⁹⁷	..	300	Luckenbach Company, Incorp., 44, Whitehall St., New York, (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Hatuey	—	Navy	—	—	—	—	—	Cuba
Hangarland ¹	..	400	(Armateurs) H. M. Wrangell & Co., A/S Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Haugland ¹	..	300	(Armateur) N. Røgenes, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Haukefjell ¹	..	200	(Armateur) Olsen & Ugelstad, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Hauraki ¹⁰	..	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Havana Maru ¹	..	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40 0.40	—	Japan
Havelland ¹⁰	..	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Havenstein ¹⁰	..	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Haverford ¹⁰	..	250	—	300, 600	P G ..	N	0.40	—	Great Britain
Havruen	—	Navy	600	O ³⁰	X	—	—	Denmark
Havhesten ¹	..	—	Navy	600	O ³⁰	X	—	—	Denmark
Havhesten ¹	..	—	U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America

Havmanden ¹	..	OVE	—	Navy	600	O ⁸⁹	X	—	Denmark
Havø ¹	..	LDC	600	(Armateur) Bergen	300, 800	P G	X	0.40	Norway
Havørnen ¹	..	OWJ	—	Navy	600	O ⁸⁹	X	—	Denmark
Havraise ¹	..	FLH	150	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300 800	P G	X	0.40	France
Havre ¹⁹	..	ZEW	135	—	300, 800	P G	X	0.40	Great Britain
Havre Maru ¹	JEJ ¹	JEJ	400	Kokusai Kisen Kaisha	300, 800	P G	X	0.40	Japan
Havur ¹	..	ATR	300	(Armateurs) Torp & Weise, Bergen	300, 800	P G	X	0.40	Norway
Hawkins	..	GEJQ	—	Navy	—	P G	—	—	Great Britain
Haworth ¹⁹	..	GBRN	—	American-Hawaiian Steamship Co., 8, Bridge Street, New York(N.Y.)	300, 800	P G	X	0.40	Great Britain
Hawaiian ¹⁹⁴	..	WKU	200	Osaka Shosen Kaisha (Osaka Mer- cantile Steamship Company)	300, 450, 800	P G	X	0.40	United States of America
Hawaii Maru ¹	..	JHW	400	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	N	0.40	Japan
Hawarden ¹⁰³	..	KUPX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 800	P G	X	0.40	United States of America
Haxtum ⁸⁹	..	KUTB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 800	P G	X	0.40	United States of America
Hay ¹	..	AHP	—	Navy	—	O	N	—	Germany
Hayabusa Maru ¹	..	JCGA	200	Rasajima Rinko Kaisha	300, 800	P G	X	0.40	Japan
Hayatori Maru ¹	..	JHY	100	Noshornusho Ministry of Agricul- ture and Commerce	300, 800	P G	N	0.40	Japan
Hayden	..	KUZP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 800	P G	X	0.40	United States of America
Haydes ^{9 131}	..	WMK	150	Marson Navigation Co., 208 Market Street, San Francisco (Cal.)	300, 800	P G	X	0.40	United States of America
Haymon ⁹⁷	..	KDBU	—	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	X	0.40	United States of America
Haynie ⁹⁷	..	KDCR	300	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	X	0.40	United States of America
Hayo Maru ¹	..	JFA	400	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 800	P G	X	0.40	Japan
Hazel Branch	..	ZGZ	150	—	300, 800	P G	X	0.40	Great Britain
Hazel Park ¹⁹	..	GFMX	—	—	300, 800	P G	X	0.40	Great Britain
Hazelside ¹⁹	..	GCKT	—	—	300, 800	P G	X	0.40	Great Britain
Hazelwood ⁸⁹	..	NENS	—	Navy	300, 800	P G	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
H. C. Flood ¹	..	ASR	150-175	(Armateur) Knut Knutsen O.A.S. Haugesund	300, 800	P G	X	0.40	Norway
H. C. Folger ^{9 131}	..	KHS	300	Atlantic Refining Company, 3144, Passyunk Ave., Philadelphia (Pa.)	300, 450, 800	P G	X	0.40	United States of America
H. C. Orsted ¹	..	OZX	100	Aktieselskabet Det Store Nordiske Telegrafsekskab, Copenhagen	300, 800	P	X	—	Denmark

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge Francs.		Country.
							Per Word.	Minimumer Radiotelegram.	
Headcliffe ¹⁹ Hearty ¹⁹	EUE GJKX	140 —	— —	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	— —	Great Britain Great Britain
Heather GFAN Heather NAKL	GFAN NAKL	— —	Navy Bureau of Lighthouses, Department of Commerce, Washington (D.C.)	300, 600	P G P G	N	— 0.20 ¹¹ 0.90 ¹²	— — —	Great Britain United States of America
Heathfield ¹⁹ Heathmore ¹⁹	ZGD MXS	— 135	— —	300, 450, 600 300, 600	P G P G	X X	0.40 0.40	— —	Great Britain Great Britain
Heath Park ¹⁹ Heathside ¹⁹ Hebe	GFMY GCYV QJV	— 135 125	— — Finska Angfartygs Aktiebolaget Helsingfors	300, 600 300, 600 300, 600	P G P G P G	X X X 0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.40 0.40 0.15	— — 0.75	Great Britain Great Britain Great Britain Finland
Heber	KDDU	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Hebrides ¹⁹ Hebron ¹⁹	GFTC GBWJ	— —	— —	300, 450, 600 300, 600	P G P G	X X	0.10 ⁸⁸ 0.40	1.00 ⁸⁸ —	Great Britain Great Britain
Hecla Hector NGX ¹⁹	GEXZ NGX	— —	Navy Navy	300, 600	P G P G	N N	— 0.20 ¹¹¹ 0.40 ¹¹²	— — —	Great Britain United States of America
Hector TWS ¹ Hector ZJS ²¹	TWS ZJS	150 —	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam Operated by A. Holt & Company Managers, Liverpool	300, 600 300, 600	P G P G	X X	— 0.40	4.00	Holland
Hecuba ²¹	GBSF	—	Operated by A. Holt & Company, India Buildings, Water Street, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Hedrun ¹	SMF	250	Stockholms Rederiaktiebolag Svea, Stockholm	300, 600	P	X	0.40	—	Great Britain
Heemskerk ¹ Heffron ^{9 121}	TXE WIBAI	200 300	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague U.S. Shipping Board, Washington	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	4.00 —	Sweden Holland United States of America

Ship	KIDF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Hegira ^{9 131}	JIV	400	Taiyo Kisen Kaisha	300, 600	P G	..	0.40	Japan
Heimdal DMH ³⁵	DMH	200	Navv	300, 600	P G	..	0.40	Germany
Heimdal LAZ	LAZ	—	Stockholm Lubeck Line, Stock-	300, 600	O	..	—	Norway
Heimdall ¹	SGH	160	holms Rederiaktiebolag, Svea, Stockholm	300, 600	P G	..	0.28	Sweden
Heime Maru ¹	JKP	400	Taiyo Kisen Kaisha	300, 600	P G	..	0.40	Japan
Heinan Maru ¹	JEB	400	Taiyo Kisen Kaisha	300, 600	P G	..	0.40	Japan
Heinrich Hugo Stinnes ³⁵	DSN	200	Arab Steamers, Ltd.	300, 600	P G	..	0.40	Germany
Heinrich Kayser ³⁵	DHK	200	Navy	300, 600	P G	..	0.40	Germany
Hejaz ¹⁵	VWBG	150	(Armateurs) Bruisgaard Kios-	300, 600	P G	..	0.40	India
Heimdal ¹	OUI	—	ternd & Co., Drammen	600	O ³⁹	..	—	Denmark
Hektor ⁷³	ASN	200	Navy	300, 450, 600	P G	..	0.40	Norway
Hela ³⁵	DHL	200	(Armateurs) A/S Jacob Engers	300, 600	P G	..	0.40	Germany
Helson ¹⁹	YBS	100-150	Rederi, Tonsberg	300, 600	P G	..	0.40	Great Britain
Heldr TSB ⁷³	TSB	200	Koninklijke Nederland Stoomboot	300, 600	P G	..	0.40	Norway
Helder TXP ¹	TXP	200	Maatschappij, Amsterdam	300, 600	P G	..	0.40	Holland
Helen ¹⁰³	KZH	200	Built-insular Steamship Company, 17, Battery Place, New York (N.Y.)	300, 600	P G	..	0.40	United States of America
Helena NGY ⁹⁹	NGY	—	Navy	300, 600	P G	..	0.20 ¹¹¹	United States of America
Helena OMZ ¹	OMZ	200	A. C. Lensen Terneuzen	300, 450, 600, 800	P G	..	0.40 ¹¹²	Holland
Helene ³⁵	DLE	120	Société Maritime et Commerciale du Pacifique, 20, Rue la Boetie, Paris	300, 600	P G	..	0.40	Germany
Helengallus ¹	UHI	250	Operated by A. Holt & Co., Managers Liverpool	300, 600	P G	..	0.40	France
Helenus ⁷¹	ZJT	230	Aktieselskabet Dampskibssels-	300, 450, 600	P G	..	— ³⁹	Great Britain
Helge ⁴⁰	OGD	200	kabet Norden, Copenhagen	300, 450, 600	P G	..	— ³⁹	Denmark
Helgoland ³⁵	DHJ	60	Nicola's Mihanovich Companie	300, 600	P G	..	0.40	Germany
Helios ¹	LQH	135	Ltd., Buenos Aires	300, 600	P G	..	0.40	Argentine Republic
Helios OJS	OJS	125	Angliatys Aktiebolaget Finska Lloyd, Helsingfors	300, 600	P G	..	0.15	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Heliotrope FSW	FSW	100	Société des Pêcheries Maritimes, 32, Rue Brizeux Lorient	450, 600	P G	0900 to 1000 1600 to 1700	0.40	—	France
Heliotrope GKN	GKN	—	Navy	—	P G	—	—	—	Great Britain
Hellen ¹	AUV	200	(Armateurs) Bruusgaard, Kjøsterud & Co., Drammen	300, 450, 600, 800	P G	X	0.40	4.00	Norway
Hellenic ¹	SFF	250	Rederiaktiebolaget Transatlantic, Gothenburg Australia Line, Gothenburg	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1800 to 2000 2300 to 2400 (local mean time)	0.40	0.40	Sweden
Hellenes ¹⁹	EOW	220	Navy	300, 600	P G	X	0.40	—	Great Britain
Hellig Olav ¹⁰	SZA	—	Aktieselskabet d e t Forenede Dampskibsselskab, Copenhagen	300, 450, 600	O P G	N	—	4.00	Greece
Hellopes ¹⁹	YPX	—	—	300, 600	P G	X	0.40	—	Denmark
Helmer Mørch ¹⁰	OHNA	200	Aktieselskabet d e t Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Great Britain
Helmsdale ¹⁹	YFG	130	—	300, 600	P G	X	0.40	—	Denmark
Helmslooch ¹⁹	ZXB	130	—	300, 600	P G	X	0.40	—	Great Britain
Helouan ¹⁷	IVY	190	Lloyd Triestino Società di Navigazione à vapore, Trieste	300, 600	P G	N	0.40	—	Italy
Helredale ¹⁹	YHC	150	—	300, 600	P G	X	0.40	—	Great Britain
Hemisphère ¹⁹	YCD	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Hemland ¹	SKV	250	Angfartygsaktiebolaget Tifring, Gothenburg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Hendaye	FRY	—	Compagnie des Chargeurs Français Plisson & Cie Paris	—	P G	N	0.40	—	France
Henderson ¹⁹	NOH	—	Navy	300, 600	P G	N	0.20 m 0.40 m 0.20 m	—	United States of America
Henley ¹⁹	NHA	—	Navy	300, 600	P G	N	0.40	—	United States of America

Heiner ⁴⁸	DWT	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Henri Deutsch	GCJP	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Meurthe ¹⁹	FBHI	—	—	300, 800	P G	N	0.05	—	France
Henriette FBHI	..	—	Navy	300, 800	P G	X	0.40	—	France
Henriette FHH ¹	..	150	A. & G. Vidor Fils, Boulogne-sur-Mer	300, 600	P G	N	0.05	—	France
Henri-Fournier	FAHU	—	Navy	300, 800	P G	X	0.40	4.00	Norway
Henrik Ibsen ¹	TUO	400	(Armateur) Vilhelm Torkildsen, Bergen	300, 600	P G	X	0.40	4.00	Norway
Hendrik Lund ¹	..	100-150	(Armateur) Willy C. Gilbert, Bergen	300, 600	P G	X	0.40	—	United States of America
Henry Clay ¹⁰⁸	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Henry County ¹⁰⁸	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	—	—	United States of America
Henry D. Whiton	..	—	Union Sulphur Co., 82, Beaver Street, New York (N.Y.)	300, 600	P G	X	0.40	—	France
Henry Fraissinet ¹	FRH	200	Fraissinet & Cie. (Compagnie Marseillaise de Navigation à Vapeur)	300, 600	P G	X	0.40	—	France
Henry Holmes ⁷¹	XJH	—	Operated by the West India and Panama Telegraph Company, Ltd., Spencer House, South Place, Finsbury, London, E.C.2.	300, 600	P	X	0.40	—	Great Britain
Henry J. Biddle ²	WOW	250	Western Fuel Company, 430, California Street, San Francisco (Cal.)	300, 600	P G	X	0.20	—	United States of America
Henry Lütgens ³⁵	DXK	200	—	300, 600	P G	..	0.40	4.00	Germany
Henry M. Flagler ^{9 131}	KOX	150	Florida East Coast Car Ferry Co., 26 Broadway, New York (N.Y.)	300, 600	P G	..	0.40	—	United States of America
Henry R. Mallory ¹⁰⁸	KEF	300	Mallory Steamship Company, Pier 36, North River, New York (N.Y.)	300, 450, 600	P G	N	0.40	—	United States of America
Henry S. Grove	KDLN	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Henry Steers ⁸⁷	KURR	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
Henry Wilson ²	WZS	30	Government, Washington (D.C.)	600	O	X	—	—	United States of America
Henshaw ⁸⁹	NUJQ	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Henzada ⁷¹	GWD	150	Siemens Bros., & Company, Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	..	0.40	—	Great Britain
Hera ^{9 131}	KDG-A	150	Standard Oil Company of New Jersey Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Herakles AVY ¹	AVY	200, 250	(Armateurs) Bruusgaard, Kiøsterud & Co., Drammen	300, 600	P G	X	0.40	4.00	Norway
Herakles SDW ¹	SDW	250	Salvage ship, belonging to the Bergnings-Och Dykeri-Aktiebolaget Neptun, Stockholm	300, 600	P	X	0.40	4.00	Sweden

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimump Radio-telegram.	
Herbert ⁸⁹	NEMJ	—	—	—	—	—	0.20 ¹¹¹ 0.40 ¹¹² 0.40	—	United States of America
Herbert G. Wylie ^{121 9}	WIF	300	Pan-American Petroleum & Transport Co., Incorp., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	X	—	—	United States of America
Herbert Horn ³⁵	DHN	200	—	300, 600	P G	0900 to 1200 1500 to 1800 2200 to 2400 and as may be required	0.40	4.00	Germany
Herbert L. Pratt ^{9 131}	KOY	300	Atlantic Refining Co., 3144, Pass-yunk Avenue, Philadelphia (P.A.)	300, 600	P G	X	0.40	—	United States of America
Herbert Sauber ³⁵	DOR	200	Société les Affréteurs Réunis, Paris	300, 600	P G	X	0.40	4.00	Germany
Hercule ¹	FLE	300	Compagnie Anonima Maritima Union, Bilbao	300, 600	P G	N	0.40	—	France
Hercules CMH ¹	CMH	150	—	300, 600	P G	N	0.30	3.00	Spain
Hercules DXR ³⁵	DXR	200	—	300, 600	P G	X	0.40	4.00	Germany
Hercules KOCT ²	KOCT	150	Rolph Nav. & Coal Co. (Armateurs) A/S Neptun Bernh	300, 600	P G	X	0.40	—	United States of America
Hercules LGY ¹	LGY	100, 150	Hanssen, Christiania..	300, 600	P G	X	0.40	4.00	Norway
Hercules NEKR ⁸⁹	NEKR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹² —	—	United States of America
Hercules PLG	PLG	60	Navy	300, 600	O ³⁹	—	—	—	Dutch East Indies
Hercules TXD ¹	TXD	150	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 600	P G	0.40	0.40	4.00	Holland
Heredia ⁸⁹	KDH	500	United Fruit S.S. Corp'n.	300, 600	P G	N	0.40	—	United States of America
Hersfordshire ³	MYA	300	—	300, 450, 600	P G	X	0.40	—	Great Britain
Herluf Trolle ¹	OUH	—	Navy	600	O ³⁹	X	—	—	Denmark
Herman Frach ⁹⁷	KDLW	200	Union Sulphur Co., 82, Beaver St., New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Hermann Burmeister ³⁵	DNR	200	—	300, 450, 600 800	P G	X	0.40	4.00	Germany
Hermann Sauber ³⁵	DHR	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Herman Sauber ⁸⁹	GBNY	100	(Armateurs) Bruusgaard Klosterud & Co., Drammen	300, 600	P G	X	0.15 ⁸² 0.40	1.50 ⁸² 4.00	Great Britain
Hermelin ¹	LWH	150, 200	—	300, 600	P G	X	—	—	Norway

Ship	Class	Year	Port of Origin	Company	Capacity	Speed	Range	Armament	Notes
Hermes PDX ¹	PDX	200	Petroleum	Maatschappij, La Corona, The Hague	300, 600	P G	..	..	Great Britain
Hermes SIM ¹	SIM	100	Begnings-och Dykeri-Aktiebolaget	Neptun, Stockholm	300, 600	P	..	..	Holland
Hermes TQT ¹	TQT	300, 480	(Armateurs)	Brugsard, Kosterud & Co., Drammen	300, 600	P G	..	..	Sweden
Hermes TWQ ¹	TWQ	150	Koninklijke Nederland Stoomboot	Maatschappij, Amsterdam	300, 600	P G	..	..	Norway
Hermion ¹	TSC	150, 200	(Armateurs)	Brugsard, Kosterud & Co., Drammen	300, 600	P G	..	..	Holland
Hermione END ¹⁹	END	200	Navy	Transport belonging to the Danish	300, 600	P G	..	..	Norway
Hermione FAHO	FAHO	100	Navy	Transport belonging to the Danish	300, 800	P G	..	..	Great Britain
Hermion ¹	OVN	100	Navy	Transport belonging to the Danish	300, 600	P G	..	..	France
Hermosa ^{9 131}	WBP	150	Wilmington Transportation Co.,	593, Pacific Electric Building, Los Angeles (Cal.)	300, 600	P G	..	..	Denmark
Hernan Cortés	EHT	—	Navy	—	300, 600	O	..	..	United States of America
Herdon ⁹⁹	NENJ	—	Navy	—	300, 600	P G	..	..	Spain
Heroic ¹⁹	GCTX	—	Navy	—	300, 600	P G	..	..	United States of America
Herold ³⁵	DEK	200	Société les Chalutiers de La	Rochelle, La Rochelle	300, 450, 600	P G	..	..	Great Britain
Heron FAX ¹	FAX	180	Navy	—	300, 600	P G	..	..	Germany
Heron NENL ⁹⁹	NENL	—	Navy	—	300, 600	P G	..	..	France
Héron II ¹⁹	FBGH	—	Navy	—	300, 800	P G	..	..	United States of America
Heroschel ¹⁹	BFI	145	Navy	—	300, 600	P G	..	..	France
Herschel ¹⁹	MUA	180	Navy	—	300, 600	P G	..	..	Great Britain
Hertford ¹⁹	GDKP	200	Navy	—	300, 450, 600	P G	..	..	Great Britain
Hertha ³⁵	DHQ	200	Navy	—	300, 600	P G	..	..	Great Britain
Hertzog Hendrik	PAD	200	Navy	—	300, 600	P G	..	..	Germany
Hesione ¹⁹	DHZ	200	Navy	—	300, 600	P G	..	..	Holland
Heslois ¹⁹	GBCQ	150	Navy	—	300, 600	P G	..	..	Germany
Hesperia ¹⁹	ZXH	180	Navy	—	300, 600	P G	..	..	Great Britain
Hesperides EFH ²	GDKW	300	Navy	—	300, 600	P G	..	..	Great Britain
Hesperides GDLR ¹⁹	GDLR	200, 250	Compañía Transmediterranea	Barcelona	300, 600	P G	..	..	Spain
Hesperos ¹	AWJ	400	(Armateurs)	Brugsard, Kosterud & Co., Drammen	300, 600	P G	..	..	Great Britain
Hessa ¹	LEG	400	(Armateurs)	Aalesunds Dampskibsselskab	300, 450, 600	P G	..	..	Norway
Hessen ¹	AHE	—	Navy	—	300, 800	O	..	..	Norway
Hêtre	FBHT	—	Navy	—	300, 600	P G	..	..	Germany
Hexham ¹	VZBJ	300	Navy	—	300, 600	P G	..	..	Australian Commonwealth

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
H. F. Alexander ^{9 131}	..	200	Pacific S.S. Company, Portland (Maine)	300, 550, 600	P G ..	N	0.40	—	United States of America
H. F. Morse ⁹⁷	..	—	U.S. Transport Co., 50, Broad St., New York (N.Y.)	300, 600	P G ..	X	0.20	—	United States of America
H. H. Asquith ¹⁹	..	—	—	300, 600	P G ..	X	0.40	—	Great Britain
H. H. Rogers ^{9 131}	..	300	Standard Oil Co., of N.J. Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Hibernia GCML ⁷¹	..	200	London and North Western Railway Co., Ltd.	300, 600	P G ..	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Hibernia SFA ¹	..	250	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Hibiscus ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Hickman ^{9 131}	..	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Hico ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Hidra	..	100, 150	Navy	300, 600	O ..	—	—	—	Portugal
Hiel ¹	..	170	Navy	300, 600	P G ..	—	—	—	Japan
Highland Enterprise ¹⁹	..	100	—	300, 600	P G ..	X	0.40	—	Great Britain
Highlander ⁵⁰	..	100	—	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Highland Glen ¹⁹	..	220	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Heather ¹⁹	..	230	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Laddie ¹⁹	..	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Laird ¹⁹	..	180	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Loch ¹⁹	..	220	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Piper ¹⁹	..	220	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Pride ¹⁹	..	220	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Prince ¹⁹	..	200	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Highland Rover ¹⁹	..	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Star ¹⁹	..	220	—	300, 600	P G ..	X	0.40	—	Great Britain
Highland Warrior ⁷¹	..	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G ..	X	0.40	—	Great Britain
Highland Watch ¹⁹	..	230	—	300, 600	P G ..	X	0.40	—	Great Britain

Shipboard Stations

	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
H. M. Whitney ^{9 121}	WPV	200	Whitney Steamship Corporation	300, 600	P G ..	X	0.40	—	United States of America
Hobart ¹ ..	VHA	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 ^a 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Hoboken ⁹⁷ ..	KDEQ	300	Erie Basin Towing and Hoisting Company	300, 440, 525, 600	P G ..	X	0.20	—	United States of America
Hobsons Bay ³ ..	VZBW	400	—	300, 450, 600	P G ..	N	0.30 ⁸ 0.40 ⁵	—	Australian Commonwealth
Hochelega CHR ²¹ ..	CHR	200	Dominion Iron and Steel Co., Sydney, N.S.	300, 600 , 800	P ..	— ²⁷	0.40	—	Canada
Hochelega VBV ²⁰ ..	VBV	200	Department of the Naval Service	300, 600 , 800	O ..	X	—	—	Canada
Hocking ¹⁹ ..	XFA	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Hofuku Maru ¹ ..	JHM	500	Kawaski Zosenjo ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Hog Island ^{9 121} ..	KODV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Hogan ⁹⁸ ..	NEXT	—	Navy ..	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Hogarth ¹⁰ ..	GDQP	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Hogland ¹ ..	SKL	250	Angfartygsaktiebolaget Tirfing, Gothenburg	300, 600	P ..	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Hoben Neuffen ²³ ..	DNF	250	—	300, 600	P G ..	X	0.40	4.00	Germany
Hohneck ¹ ..	FDY	200	Société Les Armateurs Française, 6, Rue Vignon, Paris	300, 450, 600	P G ..	X	0.40	—	France
Hokkai Maru ¹ ..	JYP	400	Meiji Kaun Kabushiki Kaisha ..	300, 600 , 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Hokuto Maru ¹ ..	JET	400	Itaya Shosen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400 2000 to 2400 0800 to 1100 1400 to 1700	0.40	—	Japan

Hotel	BPU	200	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Holbrook BPU ¹⁸	BPU	200	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	United States of America
Holbrook WQII ⁹⁷	WQII	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Holden Evans ²	KMY	150	Holden A. Evans S.S. Co., 60, Wall Street, New York (N.Y.)	300, 600	P G	X	0.20	—	Germany
Holger ³⁵	DLQ	200	—	300, 450, 600, 800	P G	X	0.40	—	United States of America
Holland ¹⁰²	NIRM	—	Transports Maritimes de l'Etat	300, 600	P G	N	—	—	France
Hollandia UBA ¹	UBA	200	Kawasaki Kisen Kaisha	300, 600	P G	X	0.40	—	Japan
Holland Maru ¹	JOR	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Great Britain
Hollinside ¹⁹	ZXU	150	Navy	300, 600	P G	X	0.40	—	Great Britain
Hollyhock	GFAP	—	—	—	P G	—	—	—	Great Britain
Hollypark ¹⁹	YDI	160	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Hollywood ⁹ ¹²¹	KDCS	300	Hollywood Steamship Corporation, 33, Pine Street, New York (N.Y.)	300, 450, 600	P G	X	0.20 ¹¹ 0.40 ¹²	—	United States of America
Hollywood WKH ²	WKH	250	Artis, Danziger Reederei- und Handels-Aktiengesellschaft, Danzig	300, 600	P G	N	0.40	4.00	Danzig (Free Town of)
Holm ³⁵	DTH	200	(Armateurs) Brunsgaard Kiestrud & Co., Drammen	300, 600	P G	X	0.40	4.00	Norway
Holmborg ¹	AQL	300	Holmens Bruks och Fabriks, Aktiebolag, Norrköping	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Holmen I ¹	SLX	250	—	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Holmengra ¹	SGN	250	Aktiebolaget Nordiska-Lloyd, Gothenburg	300, 600	P	N	0.40	4.00	Germany
Holmia ¹	SIQ	250	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 450, 600, 800	P G	X	0.40	4.00	Germany
Holsatia ³⁵	DUG	400	—	300, 600	P G	X	0.40	—	Great Britain
Holsten ³⁵	DOL	200	—	300, 600	P G	X	0.40	—	United States of America
Holby ¹⁹	BOW	140	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Holyoke Bridge ⁹⁷	KUCJ	—	—	300, 600	P G	N	0.05	—	France
Holywell ¹⁹	YED	150	—	300, 600	P G	X	0.40	—	India
Honard	FBHM	—	Navy	300, 800	P G	—	—	—	—
Homayun ¹⁹	VUJ	200	Bombay and Persia Steam Navigation Co., Ltd.	300, 450, 600	P G	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumperelegram.	
Honécourt	FKH	—	Compagnie Des Chargeurs Français, Pilsion & Cie., Paris	—	P G	X	0.40	—	France
Honefield ¹⁸	YAU	170	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 800	P G	X	0.40	—	Great Britain
Honedcliffe ⁷¹	GDKN	125	D. J. Hanlon, Alameda (Cal.)	300, 450, 800	P G	X	0.40	—	Great Britain
Honer ²	KUMG	200	—	300, 800	P G	X	0.40	—	United States of America
Homer City ¹⁹	GAB	220	—	300, 800	P G	X	0.40	—	Great Britain
Homerich ¹⁰	GDLJ	—	—	300, 450, 800	P G	N	0.40	—	Great Britain
				2,100, 2,200					
Homeside ⁴⁰	EUB	100	Algoma, Central and Hudson Bay Ky. Company, Saulte Ste. Marie (Ont.)	2,400	P G	X	0.40	—	Great Britain
Home Smith ²¹	VGJB	200	—	300, 600	P	—	0.40	—	Canada
Homestead ⁸⁷	KEKR	300	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	N	0.40	—	United States of America
Homledal ¹	LWI	150-200	(Armateurs) Feamley & Eger, Christiania	300, 800	P G	X	0.40	4.00	Norway
Honduras ¹	FTU	250	Compagnie Générale Transatlantique, Paris	300, 800	P G	N	0.40	—	France
Hong Hwa	GVLJ	200	Ho Hong Steamship Co., Ltd., Singapore	300, 800	P G	X	0.40	—	Straits Settlements
Honedaga ¹⁰³	KUXZ	—	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	N	0.40	—	United States of America
Honolulu ¹²³	WMZ	150	Honolulu S.S. Company	300, 800	P G	N	0.40	—	United States of America
Honobulu Maru ¹	JNE	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 800	P G	0800 to 1100	0.40	—	Japan
						1400 to 1700			
Honorius ¹⁹	GJE	170	Hollandsche Stoomboot Maatschappij, Amsterdam	300, 450, 800, 800	P G	X	0.40	—	Great Britain
Hontestroom ¹	TVS	150	Navy	—	P G	X	0.40	4.00	Holland
Hood	GEV	—	Verenigde Nederlandsche Scheepvaarts Maatschappij, The Hague	300, 450, 800, 800	P G	—	—	4.00	Great Britain
Hoogkerk ³⁵	OLD	200	—	—	P G	X	0.40	—	Holland
Hoosac GFWM ¹⁰	GFWM	—	U.S. Shipping Board, Washington (D.C.)	—	P G	X	0.40	—	Great Britain
Hoosier State ⁸⁷	KDUY	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 800	P G	N	0.40	—	United States of America
Hopatcong ⁸⁷	KDKC	—	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	N	0.40	—	United States of America

Shipboard Stations

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Ship	YFJ	120	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Hopelyn ¹⁹	NEXX	—	—	300, 600	P G	N	—	United States of America
Hopewell ⁹⁹		—	—	300, 600	P G	N	—	United States of America
Hopkins ¹⁰²	NUQM	300	Horace X. Baxter Steamship Company	300, 600	P G	X	—	United States of America
Horace X. Baxter ²	WOF	300	Mutsu Bussan Kaisha	300, 600	P G	X	0.40	Japan
Horaisan Maru ¹	JB	400		300, 600, 1,800	P G	X	0.40	Japan
Horda ¹	ICP	150-200	(Armateurs) J. Ludwig Mowinckles Rederi, A/S Bergen	300, 600	P G	X	0.40	Norway
Horden ¹⁹	EYR	115	—	300, 450, 600	P G	X	0.15 ⁸²	Great Britain
Hornbill ¹⁹	GFDT	—	—	300, 450, 600	P G	X	0.10 ⁸⁷	Great Britain
Hornby Castle ¹³	ZVM	160	—	300, 600	P G	X	0.40	Great Britain
Horncap ³⁵	DXF	200	—	300, 600	P G	X	0.40	Germany
Hornchurch ¹⁹	GCDD	125	—	300, 600	P G	X	0.10 ⁸⁷	Great Britain
Hornfels ³⁵	DXG	200	—	300, 600	P G	X	0.40	Germany
Horn Shell ¹⁹	XLC	210	—	300, 600	P G	X	0.40	Great Britain
Hororata ¹⁹	MRF	230	—	300, 600	P G	X	0.40	Great Britain
Horseferry ¹⁹	XFO	100	—	300, 600	P G	X	0.40	Great Britain
Hortensius ¹⁹	ETG	170	—	300, 600	P G	X	0.40	Great Britain
Ho Sang ¹⁹	GFSW	—	—	300, 450, 600	P G	X	0.40	Great Britain
Hoshu Maru ¹	JTH	400	Asano Zosenjo	300, 600	P G	X	0.40	Japan
Hostilus ¹⁹	FOX	190	(Armateurs) Alf Lunde, Larvik	300, 600	P G	X	0.40	Great Britain
Houlard ¹	LWL	400	—	300, 450, 600	P G	X	0.40	Norway
Houma ¹⁰³	WTUO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Hound ¹⁹	GDQ	150	—	300, 600	P G	X	0.10 ⁸⁷	Great Britain
Hounsflow ¹⁹	YKI	150	—	300, 600	P G	X	—	Great Britain
Houstonic GCDN ¹⁹	GCDN	—	—	300, 600	P G	X	—	Great Britain
Housatonic NFX ⁹⁹	NFX	—	Navy	300, 600	P G	N	—	United States of America
Houston KDGO ⁹ 131	KDCO	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	—	United States of America
Houston NGZ ⁹⁹	NGZ	—	Navy	300, 600	P G	N	—	United States of America
Houtman ¹	PMC	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.20 ¹¹¹ 0.40 ¹¹²	Dutch East Indies
Hova ¹⁰⁰	FBHO	—	Navy	300, 800	P G	N	0.05	France
Hoven ¹⁰⁰	KEXV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Hovey ⁹⁹	NEPB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Howard KQH ¹⁰³	KQH	200	Merchant and Miners Transportation Co., Light and German St. (Baltimore Md.)	300, 450, 600	P G	N	0.40	United States of America
Howard NIFM ⁹⁹	NIFM	—	Navy	300, 450, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Howick Hall ⁹ 131	KLT	150	U.S. Steel Products Co., 30, Church St., New York	300, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
Howra ¹⁹ ..	GFSJ	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Hoxbar ⁹⁷ ..	KIJQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hoxie ⁹⁷ ..	KEMK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hoyeisan Maru ¹ ..	JFQ	400	Mitsui Bussan Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Hozan Maru ¹ ..	JVZ	400	Osaka Shosen Kaisha (Osaka) Mercantile Steamship Company	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Hozu ¹ ..	JWM	—	Navy ..	—	Q ..	—	—	—	Japan
Hozui Maru ¹ ..	JFR	200	Yamashita Kisen (Kabushiki) Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
H. Pontopiddan ⁴⁰ ..	—	—	Aktieselskabet Dampskabselskabet Vendila, Copenhagen	—	—	—	—	—	Denmark
H. T. Harper ¹²⁰ ..	KDVM	—	Standard Oil Co. of California ..	300, 600	P G ..	X	—	—	United States of America
Huanchaco ¹⁹ ..	GJF	200	—	300, 600	P G ..	0900 to 1100 2000 to 0200	0.40	—	Great Britain
Huallaga ⁵¹ ..	OCH	250	Cia Peruana Vap y dique del Callao	300, 600	P G ..	X	0.40	—	Peru
Huasco ¹ ..	CDC	150	Cia Sud Americana de Vapores, Calle Blanco, 895, Valparaiso	300, 600	P G ..	X	0.40	4.00	Chile
Hubbard ⁹⁹ ..	NDX	—	Navy ..	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Hubert ¹⁹ ..	MVI	180	(Armateurs) Bergen Lloyd A/R, Bergen	300, 600	P G ..	X	0.40	—	Great Britain
Hubro ¹ ..	AST	200	Compagnie Générale Transatlan- tique, Paris	300, 600	P G ..	X	0.40	4.00	Norway
Hudson ¹ ..	FTH	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	France
Hudson KDCI ⁹⁷ ..	KDCI	—	Tatsuma Kisen Kabushiki Kaisha	—	P G ..	N	0.40	—	United States of America
Hudson Maru ¹ ..	JBO	400	—	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Huffero ¹ ..	TTF	150-200	(Armateur) Henrik Ostervoldt Christiansia	300, 600	P G ..	X	0.40	4.00	Norway

Shipboard Stations

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Ship	GBRI	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	N	0.40	United States of America
Hugin	..	150	..	300, 450, 600	P G	N	0.40	Great Britain
Hugin	..	150	..	300, 450, 600	P G	N	0.40	Sweden
Hugo Shines 6 35	..	200	..	300, 450, 600	P G	N	0.40	Germany
Hugonot 9 131	..	300	..	300, 600	P G	N	0.40	United States of America
Hukley 103	..	200	..	300, 600	P G	N	0.40	United States of America
Hulaco 9 131	..	300	..	300, 600	P G	N	0.40	United States of America
Hulbert 99	..	—	..	300, 600	P G	N	0.20 111 0.40 112	United States of America
Hull 103	..	—	..	300, 600	P G	N	0.40 112	United States of America
Hulpvaardigen	..	150	..	300, 450, 600	P G	N	0.40	Holland
Hulver 103	..	150	..	300, 450, 600	P G	N	0.40	United States of America
Humacenna 97	..	150	..	300, 600	P G	N	0.40	United States of America
Humaitá 1	..	135	..	300, 600	P G	N	0.40	Argentine Republic
Humber 1	..	125	..	300, 600	P G	N	0.40	Holland
Humrick 9 131	..	150	..	300, 600	P G	N	0.40	United States of America
Hunt 99	..	—	..	300, 600	P G	N	0.40	United States of America
Humphreys 99	..	—	..	300, 600	P G	N	0.40	United States of America
Hundvaago 1	..	150-175	..	300, 600	P G	N	0.40	Norway
Hungaria 3	..	190	..	300, 600	P G	N	0.40	Italy
Hunnie 71	..	—	..	300, 600	P G	N	0.40	Great Britain
Hunstanworth 19	..	—	..	300, 600	P G	N	0.40	Great Britain
Huntingdon 19	..	—	..	300, 450, 600	P G	N	0.40	Great Britain
Huntington 99	..	—	..	300, 600	P G	N	0.20 111 0.40 112	United States of America
Huntley	..	—	..	300, 600	P G	N	0.40	Great Britain
Huntress 46	..	Day 250 Night 1,000	..	300, 600	P G	N	0.40	Great Britain
Huntsend 19	..	150	..	300, 600	P G	N	0.40	Great Britain
Huntsgreen 19	..	150	..	300, 600	P G	N	0.40	Great Britain
Huntsman 19	..	—	..	300, 450, 600	P G	N	0.40	Great Britain
Huon	..	—	..	300, 600	P G	N	0.40	Australian Commonwealth
Huon	..	—	..	300, 600	P G	N	0.40	Great Britain
Huron FABU	..	—	..	300, 800	P G	N	0.05	France
Huron KVB 103	..	300	..	300, 450, 600	P G	N	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimump Radio-telegram.	
Huron NSX ⁹⁹	NSX	—	—	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.40	—	United States of America
Huronic ²¹	VGE	200	Northern Navigation Co., Ltd., Sarnia (Ont.)	300, 600	P G ..	— ²⁷	—	—	Canada
Huron WCH ^{9 121}	WCH	150	Wyandotte Transportation Co., Detroit (Mich.)	300, 600	P G ..	X	0.10 ¹¹²	—	United States of America
Huronian ¹⁹	YZM	200	—	300, 600	P G ..	N	0.40	—	Great Britain
Huronul ¹⁹	GFCZ	250	—	300, 600	P G ..	X	0.40	—	Great Britain
Hutchinson ^{9 121}	KUJP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Hval ..	LAN	—	Navy	—	O ..	—	—	—	Norway
Hvalrossen ¹	OVH	—	Navy	600	O # O ..	X	—	—	Denmark
Hvidehavet ¹	OGJ	250	Aktieselskabet Dampskibsselskabet Atlantehavet, Copenhagen	300, 450, 600 800	P G ..	X	0.40	4.00	Denmark
Hwah Jah	XSI	500	Yu Fong Steamship Company ..	600	P G ..	12 hours 8 hours	—	—	China
Hwah Ping	XSK	300 Day 600 Night	—	600	P G ..	8 hours 8 hours	0.60	—	China
Hwah Ting	XSL	200-300	Yu Fong Steamship Company ..	200, 600 600	P G ..	8 hours 8 hours	—	—	China
Hwah Yih	XSJ	Day 300 Night	—	600	—	8 hours 8 hours	—	—	China
H. W. Croft ^{9 121}	WQF	450 200	Harvey H. Brown & Co., Cleveland (Ohio)	300, 450, 600	P G ..	X	0.20	—	United States of America
Hyacinth ⁹⁹	NAGV	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Hyacinthus ¹⁹	GJG	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Hyannis ⁴⁸³	KINC	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hyantes ¹⁹	EJJ	100	—	300, 600	P G ..	X	0.40	—	Great Britain
Hybert ^{9 121}	KDCA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Hydaspes ¹⁹	GJH ⁴	200	Navy	300, 600 600	P G ³⁹ O ..	X	0.40	—	Great Britain
Hydra PAQ	PAQ	—	—	—	O ³⁹	X	—	—	Great Britain
Hydra SVH ¹	SVH	100-150	The Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G ..	N	0.40	4.00	Holland
Hydra SVH	SVH	—	Navy	—	O ..	—	—	—	Greece

Ship	Class	Year	Operator	Capacity	Port	Country	Notes
Hyson ¹¹	ZKI	186	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	Great Britain	
Iago ¹⁰	GBSM	—	—	300, 600	P G	Great Britain	
Iamala	HLI	100	Hernandez Mendirichagay Com- pañia, Bilbao	300, 600	O	Russia	
Ibatzabal ¹	HLI	100	—	300, 600	P G	Spain	
Ibaragi Maru ¹	JBCA	150	Ibaragiken ..	300, 600	P ¹⁵	Japan	
Ibiapaba ¹⁵	PVV	150	Lloyd Brasileiro, Rio De Janeiro	300, 600	P G	Brazil	
Ibérica ^{57 1}	FRB	200	Fraissinet & Cie. (Compagnie Marseillaise de Navigation à Vapeur), Marseilles	300, 600	P G	France	
Ibérica ¹⁰	OSI	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	Belgium	
Ibex ⁷¹	MSC	120	Great Western Railway Co.	300, 600	P G	Great Britain	
Ibo	CIL	100-150	Navy	300, 600	O	Portugal	
Ibuki ¹	JGT	—	U.S. Shipping Board, Washington	300, 600	P G	Japan	
Iceland ⁹⁷	KOKK	—	(D.C.)	300, 600	P G	United States of America	
Ice King ^{9 131}	KJUA	—	U.S. Shipping Board, Washington	300, 600	P G	United States of America	
I. C. La Cour ¹⁰	OYL	150	Aktieselskab det Forenede Dampskibsselskab, Copenhagen	300, 600	P G	Denmark	
Iconium ⁹⁷	WQUO	—	U.S. Shipping Board, Washington	300, 600	P G	United States of America	
I. C. White ^{9 131}	KDDB	300	Pan-American Petroleum and Transport Co., Incorp.	300, 600	P G	United States of America	
Ida IWB ¹⁷	IWB	140	Societa Italiana di Armanento & Navigazione, Rome	300, 600	P G	Italy	
Ida Z.O. ¹⁷	URB	140	Odero N. & C., Genoa	300, 600	P G	Italy	
Ida WL.V ¹³¹	WLV	250	U.S. Shipping Board, Washington	300, 450, 600	P G	United States of America	
Idaho GJJ ¹⁹	GJJ	250	(D.C.)	300, 600	P G	Great Britain	
Idaho NHN ⁹⁹	NHN	—	Navy	300, 600	P G	United States of America	
Idesleigh ¹⁹	ELF	140	(Armateurs) A/S Den Norske	300, 600	P G	Great Britain	
Idefjord ¹	ASC	250-300	Amerikalnjet, Christiania	300, 600	P G	Norway	
Idomeneus ⁷¹	GZY	210	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	Great Britain	
I. D.S. Adolph ⁶⁰	OHB	350	Aktieselskab Dampskibsselskab Vendila, Copenhagen	300, 450, 600	P G	Denmark	
Idzumo ¹	IRG	—	Navy	800	O	Japan	
Ierax	SYE	—	Navy	—	O	Greece	
Ignacio ¹	TMB	200	Jose A. de Mutiozabal, Bilbao	300, 600	P G	Spain	
Ignati Sergeev	RDD	200	Zappala Alessandro, Rome	300, 600	O	Russia	
Ignazio Florio ¹⁷	ICCS	190	Florio, V. & I., Rome	300, 600	P G	Italy	
Igotz-Mendi ¹	UQU	140	Sota y Aznar, Bilbao	300, 600	P G	Spain	
Ignatada ¹	HMQ	250	Sociedad Anonima Naviera	300, 600	P G	Spain	
Ignatada ¹	TJK	150	Espanola, Barcelona	300, 600	P G	Spain	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radio-telegram.	
Iguassú ¹⁸ ..	STS	100	Lage & Irmãos, Rio de Janeiro ..	300, 600	P G ..	N	0.40	—	Brazil
I. J. Merritt ² ..	KOVZ	200	Merritt & Chapman, Derrick and Wrecking Co., 17 Battery, New York (N.Y.) ..	300, 600	P G ..	X	0.20 ¹¹¹	—	United States of America
Ijsselstroom ¹ ..	TVZ	150	Hollandse Stoomboot Maatschappij, Amsterdam ..	300, 600	P G ..	X	0.40	4.00	Holland
Ikala ¹⁹ ..	ZUT	170	Tetsudoshō (Ministry of Railways)	300, 600	P G ..	X	0.40	—	Great Britain
Iki Maru ¹ ..	JIL	350	—	300, 600, 1,800	P G ..	N	0.40	—	Japan
Ikoma ¹ ..	JGQ	—	Navy	—	O	—	—	—	Japan
Ikomasan Maru ¹ ..	JBV	400	Mitsui Bussan Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Ile de France ¹ ..	UIQ	180	Veron & Cie., 21, Rue Massiou, La Rochelle ..	300, 450, 600	P G ..	X	0.40	—	France
Ile de la Réunion ¹ ..	FLN	150	Compagnie Havraise Péninsulaire de Navigation à Vapeur ..	300, 600	P G ..	X	0.40	—	France
Ilford ¹⁹ ..	YKL	145	—	300, 600	P G ..	X	0.40	—	Great Britain
Ilheos ¹⁵ ..	PUN	150	Companhia de Navegação Bahiana São Salvador (Bahia) ..	300, 600	P G ..	N	0.40	—	Brazil
Illingworth ⁵⁰ ..	GDFM	350	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Illinois KDSZ ..	KDSZ	—	Texas Company, Port Arthur (Texas) ..	300, 600, 1,800	P G ..	X	—	—	United States of America
Illinois NHO ⁹⁹ ..	NHO	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Illinois WCZ ^{9 151} ..	WCZ	150	Goodrich Transit Co., Foot of Michigan Avenue, Chicago (Ill.) ..	300, 600	P G ..	X	0.20	—	United States of America
Imenau ³⁵ ..	DXO	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Imuntzar-Mendi ¹ ..	HMR	150	Sota y Aznar, Bilbao ..	300, 600	P G ..	N	0.30	3.00	Spain
Imani ⁷¹ ..	ZDO	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18 ..	300, 450, 600	P G ..	X	0.40	—	Great Britain
Imatra ¹ ..	OIX	250	Paulin & Kni, Wiborg ..	300, 600	P G ..	X	0.15	0.75	Finland
Imber ¹⁹ ..	YFD	160	Compagnie des Messageries Maritimes, Paris ..	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Imérina ¹ ..	FIM	400	—	300, 600	P G ..	— ⁸⁷	0.40	—	France
Imlay ¹⁰³ ..	KIZV	300	U.S. Shipping Board, Washington (D.C.) ..	300, 600	P G ..	X	0.40	—	United States of America
Immacolata ¹ ..	HVM	300	Transports Maritimes de l'Etat ..	300, 600	P G ..	X	0.40	—	France

Impavido ..	IV	150	Navy	Imperia Ship Corporation	300, 600	P	—	—	—	Italy
Impetia ² ..	VAM	150	Cla Sud-Americana de Vapores	Calle Blanco, 805, Valparaiso	300, 600	P G	—	—	—	Canada
Imperial ¹ ..	CDE	150	Imperial Oil Ltd., Toronto (Ont.)	Navy	300, 600	P	—	—	—	Chile
Imperial ²¹ ..	VGM	150	Navy	300, 600	P G	—	—	—	—	Canada
Impéteuse ..	FBJI	—	Vve. Pichon & Alphonse Terroir	(Armateurs) Boulogne-sur-Mer	300, 600	P G	—	—	—	France
Imprevu ¹ ..	FYP	180	Nippon Yusen Kaisha (Japan Mail	Steamship Company)	300, 600, 1,800	P G	—	—	—	France
Inaba Maru ¹ ..	JIB	450	Itaya Shosen Kaisha	300, 600	P G	—	—	—	—	Japan
Inaho Maru ¹ ..	JFB	400	Navy	300, 450, 600	P G	—	—	—	—	Japan
Ina Loffe Blumenthal ²⁵	DLB	200	Navy	300, 800	P G	—	—	—	—	Germany
Inca ..	FBIK	—	Navy	300, 450, 600	P G	—	—	—	—	France
Incmore ¹⁶ ..	GDVP	—	Navy	300, 800	P G	—	—	—	—	Great Britain
Inconstant FBIC	FBIC	—	Navy	300, 450, 600	P G	—	—	—	—	France
Inconstant GEJR	GEJR	—	Navy	300, 450, 600	P G	—	—	—	—	Great Britain
Independence ⁹⁷ ..	WJIO	300	U.S. Shipping Board, Washington	(D.C.)	300, 450, 600	P G	—	—	—	United States of America
Independence Hall ^{9 131}	KDCG	300	U.S. Shipping Board, Washington	(D.C.)	300, 450, 600	P G	—	—	—	United States of America
Independencia ¹ ..	LKK	—	Navy	450, 600	O	—	—	—	—	Argentina Republic
Independent Bridge ⁹⁷	KOGB	300	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
India Arrow ^{9 131}	KDHP	300	Standard Transportation Co.,	26, Broadway, New York	300, 450, 600	P G	—	—	—	United States of America
India CUI ⁶¹	CUI	100-150	Kawasaki Zosenjo	—	300, 600	P G	—	—	—	Portugal
India Maru ..	JIE	400	N. V. Insulinde Tank Stoomboot	Maatschappij	300, 600	P G	—	—	—	Japan
India PLU ¹ ..	PLU	400	Navigazione Generale Italiana,	Genoa	300, 600	P G	—	—	—	Dutch East Indies
Indian ¹⁹ ..	MHB	190	Compagnie Générale Transatlan-	tique, 6, Rue Aubert, Paris	300, 600	P G	—	—	—	Great Britain
Indian City ¹⁹ ..	GDPC	—	Goodrich Transit Co., Foot of	Michigan Ave., Chicago (Ill.)	300, 600	P G	—	—	—	Great Britain
Indian Prince ¹⁹ ..	ZOX	—	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	Great Britain
Indiana Transport ¹⁹	ZDR	120	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	Italy
Indiana IYI ¹⁷ ..	IYI	190	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indiana NIRS ¹⁰³	NIRS	—	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indiana UCS ¹ ..	UCS	200	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indiana WFC ^{9 131}	WFC	150	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indiana Bridge ^{9 131}	KOND	300	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indiana Harbor ¹⁰³	KUBS	—	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America
Indianapolis ¹⁰³ ..	WROE	300	U.S. Shipping Board, Washington	(D.C.)	300, 600	P G	—	—	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump radio-telegram.	
Indianic ¹ ..	SFE	250	Rederiaktiebolaget Transatlantic, Gothenburg Australia Line, Gothenburg	300, 600	P ..	0300 to 0400 0700 to 0800 1100 to 1200 1300 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Indianola ¹⁹ Indien ⁴⁰ ..	ODF OCBA	145 250	—	300, 600 300, 450, 600 800	P G .. P G ..	X X	0.40 0.40	— 4.00	Great Britain Denmark
Indier ¹⁰ .. Indo Maru ¹	ONI JDS	150-200 400	Aktieselskabet Dampskibsselskabet Orient, Copenhagen Lloyd Royal Belge (Antwerp) Osaka Shosen Kaisha (Osaka) Mercantile Steamship Company)	300, 600 300, 600 300, 600	P G .. P G ..	N 0800 to 1100 1400 to 1700 2000 to 2400	0.40 0.40	4.00 —	Belgium Japan
Indore ¹⁸ .. Indomito ..	GBVP IIS	210 —	Navy	300, 600 —	P G .. —	X —	0.40 —	— —	Great Britain Italy
Indret .. Indus Maru ¹	FAOQ JCR	— 200	Navy Osaka Shosen Kaisha (Osaka) Mercantile Steamship Company)	600, 800 300, 600	P G .. P G ..	N 0800 to 1100 1400 to 1700 2000 to 2400	0.05 0.40	— —	France Japan
Industria ²⁵ Industria SMO ¹ ..	DJN SMO	200 150	— Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600 300, 600	P G .. P	X 0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40 0.40	4.00 4.00	Germany Sweden
Industry ¹ In és ⁴¹ .. Infanta Isabel de Borbon ¹	GJBP FHZ EDI	75 200 430	— Fourny & Cie., Boulogne-sur-Mer Compañia Trasatlantica, Barcelona	300, 600 300, 600 300, 600	O .. P G .. P G ..	— X N	— 0.40 0.30	— — 3.00	Great Britain France Spain
Infanta Isabel EBL ¹ Infanta Isabel ECV ¹ Infatigable ..	EBL ECV FAXI	216 300 —	Navy Pinillos Izquierdo y Cia, Cadiz Navy	— 300, 600 300, 800	O .. P G .. P G ..	— N N	— 0.30 0.05	— 3.00 —	Spain Spain France
Inga ¹⁵ .. Ingelborg ³⁵ ..	SSK DII	60 200	Lage & Irmãos	300, 600 300, 450, 600 900	P G .. P G .. P G ..	N X	0.40 0.40	— 4.00	Brazil Germany
Ingelborg Larsen ¹⁹ ..	GCVP	—	—	300, 450, 600 900	P G ..	X	0.40	—	Great Britain

Ingleby ¹⁹	..	MXI	140	Compagnie Marsellaise de Navigation à Vapeur	300, 600	P G	..	X	0.40	Great Britain
Ingo ¹	..	HPZ	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	France
Ingold ¹⁰³	..	WLJU	300	Navy	300, 600	P G	..	X	0.40	United States of America
Ingolf ¹	..	OWK	190	(Amateurs) Tornod	600	O ³⁹	..	X	—	Denmark
Ingoma ¹⁹	..	GDV	150	(Amateurs) Jacob Kjøde, Bergen	300, 800	P G	..	X	0.40	Great Britain
Ingelborg Bakkevig ¹	..	LWM	150	(Amateurs) Jacob Kjøde, Bergen	300, 450, 600	P G	..	X	0.40	Norway
Ingeniero	..	CWH	55	Navy	600	O	..	—	—	Uruguay
Inger Benedicte ¹	..	AQW	200	(Amateurs) Jacob Kjøde, Bergen	300, 600	P G	..	X	0.40	Norway
Ingram ⁹⁹	..	NENX	—	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Ingram Osmond ⁹⁹	..	NIGF	—	Navy	300, 600	P G	..	N	—	United States of America
I. Nieveo	..	IJL	—	Navy	—	—	..	—	—	Italy
Inkula ¹⁹	..	ODG	—	—	300, 600	P G	..	X	0.40	Great Britain
Inkum ⁵⁰	..	GDZF	100	—	300, 600	P G	..	X	0.40	Great Britain
Inland ¹	..	SKQ	250	Angfartysaktiebolaget Tifring	300, 600	P	..	—	0.40	Sweden
Inneroy ¹	..	AUQ	200	(Amateurs) Kløver & Co., Christiania	300, 600	P G	..	X	0.40	Norway
Innerton ¹⁹	..	YFN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	Great Britain
Innokto ¹⁰³	..	KITJ	300	Luis Ibran, Oviedo	300, 450, 600	P G	..	X	0.40	United States of America
Inocencio Figueredo ¹	..	TLQ	150	Navy	300, 600	P G	..	N	0.30	Spain
Inskidoso	..	IIT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	—	Italy
Inspector ¹⁰³	..	KOKR	—	Stoomvaart Maatschappij Rotterdam	300, 450, 600	P G	..	X	0.40	United States of America
Inston ¹⁹	..	GFIM	—	—	300, 600	P G	..	—	0.40	Great Britain
Insulinde ¹	..	PFS	250	—	300, 600	P G	..	—	0.40	Holland
Intaba ¹⁹	..	MIP	180	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	N	0.40	Great Britain
Intan ^{9 131}	..	KIGK	300	—	300, 600	P G	..	N	0.40	United States of America
Intombi ¹⁹	..	ZLL	180	W. S. Kilmer	300, 600	P G	..	X	0.40	Great Britain
Intrepidi ^{9 131}	..	KDHI	150	—	300, 800	P G	..	X	0.40	United States of America
Intrepid ¹	..	FBWI	—	J. Percival Jefferson	300, 800	P G	..	N	0.05	France
Invader ^{9 131}	..	KDWR	150	—	300, 600	P G	..	N	—	United States of America
Inventor ¹⁹	..	MVY	180	—	300, 800	P G	..	X	0.40	Great Britain
Inveraver ¹⁹	..	GBVW	—	—	300, 600	P G	..	X	0.40	Great Britain
Inveravon ¹⁹	..	GFSN	—	—	300, 450, 600	P G	..	X	0.40	Great Britain
Inverawe ¹⁹	..	ZTD	135	—	300, 600	P G	..	X	0.40	Great Britain
Ivergordon ¹⁹	..	GFSM	—	—	300, 450, 600	P G	..	X	0.40	Great Britain
Inverleith ¹⁹	..	GDVK	—	—	300, 600	P G	..	X	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-tele-gram.	
Inverness ¹⁹	EIU	140	—	300, 600	P G	X	0.40	—	Great Britain
Inverurie ¹⁹	GFSP	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Investigator ²	VUT	150	—	600	O ⁸	X	0.40 ¹⁸	—	India
Invicta (L) ¹⁹	EOT	—	—	300, 600	P G	X	0.40	—	Great Britain
Invicta GUL ¹⁹	GUL	50	—	300, 600	P G	N	0.10	1.00	Great Britain
Invincible ^{9 131}	WCH	300	Operated and owned by South Eastern & Chatham Railway	300, 450, 600	P G	X	0.20	—	United States of America
Ioanna ¹	THS	150-200	U.S. Shipping Board	300, 600	P G	X	0.40	4.00	Greece
Ioanna ¹	TGO	100-150	E. Angelis, Athens	300, 600	P G	X	0.40	4.00	Greece
Ioannis Vatis ¹	SWR	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G	X	0.40	4.00	Greece
Iocasti ¹	THX	150-200	J. L. Vatis & Co., Syra	300, 600	P G	X	0.40	4.00	Greece
Iocolite ²¹	VBS	200	The Hellenic Transport Steamship Co., Athens	300, 600	P G	— ²⁷	0.40	—	Canada
Iolkos ¹ SWJ	SWJ	100-150	Imperial Oil Ltd., Toronto (Ont.)	300, 600, 800	P G	X	0.40	4.00	Greece
Ionic ¹⁹	MWI	230	Hellenic Transport Co., Athens	300, 600	P G	X	0.40	—	Great Britain
Ionicstar ¹⁹	ZXP	180	—	300, 450, 600	P G	X	0.40	—	Great Britain
Ionia ¹	FPO	200	Compagnie De Navigation Paquet, Marseilles	300, 600	P G	— ²⁷	0.04	—	France
Ionier ¹⁰	OPI	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Iouchar ¹⁹	RBT	150	—	300, 600	O	X	0.40	—	Russia
Iowa NIRP ¹⁹	NIRP	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Iowa UCN	UCN	200	—	300, 600	P G	X	0.40 ¹¹²	—	France
Iowan ¹⁸⁴	WKJ	150	Compagnie Générale Transatlantique, 6, Rue Aubert, Paris	300, 450, 600	P G	X	0.40	—	United States of America
Ipanema ¹	FKV	400	Amer-Hawian S.S. Co., 8, Bridge Street, N.Y.	450, 600, 800	P G	X	0.40	—	France
Ipswich ¹⁸⁴	KILV	300	Société Générale des Transports Maritimes à Vapeur, 70, Rue de la République, Marseilles	300, 600	P G	X	0.40	—	United States of America
Iquique ¹	CDS	250	Shawmut S.S. Company, 60, Federal St., Boston (Mass.)	300, 600	P G	X	0.40	4.00	Chile
Irages ²	KDYH	200	Gonzales Sofia & Cia, Calle Blanco, 849, Valparaiso	300, 500, 600	—	—	0.20	—	United States of America
Irene KOKT ¹⁸⁸	KOKT	300	International Petroleum Company A. H. Bull S.S. Company, 17, Battery Place, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Irene SDC ¹	SDC	150	Rederiaktiebolaget Karmann Hallsingborg	300, 600	P	0700 to 0800 1100 to 1200 1500 to 1600	0.40	4.00	Sweden

Ship	Year	Builder	Length	Breadth	Depth	Displacement	Armament	Speed	Range	Endurance	Notes
Iris	1871	Italy	140	50	12	300, 600	Società Italiana di Armamento & Navigazione, Rome	14	1,000	100	Great Britain
Iris GFPO	71	Italy	140	50	12	300, 600	Operated by Harry Fothergill, Esquire	14	1,000	100	Great Britain
Iris LFH	71	Italy	140	50	12	300, 450, 600	(Armateurs) det Bergenske Dampskibsselskab, Bergen	14	1,000	100	Norway
Iris MNI	71	Italy	140	50	12	300, 600	Pacific Cable Board	14	1,000	100	Great Britain
Iris PHQ	71	Italy	140	50	12	300, 600	Petroleum Maatschappij La Corona, The Hague	14	1,000	100	Holland
Iris SGK	71	Italy	140	50	12	300, 600	Rederiaktiebolaget Iris, Stockholm	14	1,000	100	Sweden
Iris SRU	75	Brazil	190	60	15	300, 600	Lloyd Brasileiro, Rio de Janeiro	14	1,000	100	Brazil
Iris WOJ	75	United States of America	200	60	15	300, 450, 600	Pacific Transport Company	14	1,000	100	United States of America
Iris GJK	75	Great Britain	220	60	15	300, 600	—	14	1,000	100	Great Britain
Iris Monarch	75	Norway	170	50	12	300, 600	(Armateurs) det Bergenske Dampskibsselskab, Bergen	14	1,000	100	Norway
Irisma	75	Norway	170	50	12	300, 450, 600	—	14	1,000	100	Norway
Irisgard DIM	75	Germany	Day 240	480	300	300, 450, 600	Hamburg-Bremen-Afrika-Linie, Hamburg	14	1,000	100	Germany
Irisgard DIR	75	Germany	50-60	60	15	300, 600	—	14	1,000	100	Germany
Irisgard DHC	75	Germany	50-60	60	15	300, 600	—	14	1,000	100	Germany
Iris Iron	75	Greece	100-150	300	15	300, 600	P. Margaronis & Sons, Piræus	14	1,000	100	Greece
Iris Iron Baron	75	Australian Commonwealth	100-150	300	15	300, 600	—	14	1,000	100	Australian Commonwealth
Iron Duke	75	Great Britain	—	300	15	300, 600	Navy	14	1,000	100	Great Britain
Iron Monarch	75	Australian Commonwealth	—	300	15	300, 600	—	14	1,000	100	Australian Commonwealth
Iron Prince	75	Australian Commonwealth	—	300	15	300, 600	—	14	1,000	100	Australian Commonwealth
Iroquois GFUO	75	Great Britain	—	150	15	300, 600	Navy	14	1,000	100	Great Britain
Iroquois KUTQ	75	United States of America	—	150	15	300, 600	Chicago & South Haven S.S. Co., Chicago (Ill.)	14	1,000	100	United States of America
Iroquois KVF	75	United States of America	—	150	15	300, 450, 600	Clyde S.S. Co., Pier 36, North River, New York (N.Y.)	14	1,000	100	United States of America
Iroquois MEI	75	Great Britain	—	150	15	300, 600	Navy	14	1,000	100	Great Britain
Iroquois NHV	75	United States of America	—	150	15	300, 600	Navy	14	1,000	100	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum Radio-telegram.	
Iroulégu	FKI	—	Compagnie des Chargeurs Françaises Pilon & Cie., Paris	—	P G ..	N	0.40	—	France
Iroquois	IIX	—	Navy	300, 600	P G ..	X	—	—	Italy
Irvington ^{9 121}	KOGQ	—	U.S. Shipping Board, Washington (D.C.)	—	P G ..	—	0.40	—	United States of America
Isaac Peral	EHP	—	Navy	—	O ..	N	—	—	Spain
Isabel de Lusa ¹	TJJ	100	Vinda de Lusa y R. Masía, Barcelona	300, 600	P G ..	—	0.30	3.00	Spain
Isalania ²⁵	HEF	100	Graat Bentinck en Waldeck-Limpurg, Middachten	300, 450, 600	P ..	X	—	—	Holland
Isanti ¹⁰⁸	WVEV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Isbrytaren II ¹	SHR	150	Ice Breaker belonging to City of Stockholm	300, 600	P ..	— ^{as}	0.28	2.80	Sweden
Ischia ¹⁷	INZ	190	Marittima Italiana Società di Navigazione Perservi Postali, Genoa	300, 600	P G ..	X	0.40	—	Italy
Isc ¹	JGP	—	Navy	—	O ..	—	—	—	Japan
Islands Falk ¹	QUI	—	Navy	600	O ^{as} ..	X	—	—	Denmark
Islerwood ¹⁰²	NUV	—	Società Italiana di Armamento & Navigazione, Rome	300, 600	P G ..	N	—	—	United States of America
Isidre ¹⁷	LXC	140	Navy	300, 600	P G ..	X	0.40	—	Italy
Iskheul	FAVI	—	Navy	300, 600, 800	P G ..	N	0.05	—	France
Isla de Luzon ²	VRP	100	Bahama Salvors, Ltd.	450, 600	P ..	X	0.30	—	Bahamas
Isla de Menorca ²	EFO	100	Compañía Islena Maritima, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Isla de Panay ¹	EDP	269	Compañía Transatlantica, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Island ¹⁰	OYZ	300	Aktieselskabet det Forenede Dampskibs-Selskab, Copenhagen	300, 450, 600	P G ..	X	0.40	4.00	Denmark
Islandia ¹⁹	XJN	190	Compañía Islena Maritima, Barcelona	300, 600	P G ..	X	0.40	—	Great Britain
Islenoor ¹⁰	EXE	—	Southern Pacific Co., Peir 49, North River, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	Great Britain
Isleno ²	EFI	100	The Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G ..	N	0.30	3.00	Spain
Isico (El)	KDNA	150	Compañía Islena Maritima, Barcelona	300, 600	P G ..	X	0.40	—	United States of America
Ismene ¹	TGF	150-200	North River, New York (N.Y.)	300, 600	P G ..	X	0.40	4.00	Greece
Isolè ¹	FAL	180	Société la Pêche Maritime Française	300, 600	P G ..	X	0.40	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Itapema ¹²	..	240	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itaperuna ¹³	..	150	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itapuca ¹³	..	240	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itapuhu ¹³	..	190	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itapura ¹³	..	190	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itaquatia ¹³	..	250	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itaquera	190	Cia N. Navegação, Costeira ..	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itassucê ¹³	..	190	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itata ¹	250	Cia Nacional de Vapores, Calle Blanco, 1169 Valparaíso	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	4.00	Chile
Itatinga ¹³	..	190	Companhia Nacional de Navegação Costeira, Rio de Janeiro	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itaubá ¹³	240	Companhia Nacional de Navegação Costeira, Rio de Janeiro.	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	—	Brazil
Itaui ¹⁰	150-300	Association Maritime Belge. Ant-	300, 600	P G ..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000 N	0.40	4.00	Belgium

	GKIS	Navy	Tonnage	Speed	Range	Armament	Notes	United States of America
Ichen Itonpa ^{a 181}	KENR	—	200	—	—	—	U.S. Shipping Board, Washington (D.C.)	United States of America
Idu ¹³	SSF	Lage & Irmãos, Rio de Janeiro	300, 600	P G	..	..	..	Brazil
Ihuri-Aurri ¹	CXK	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri-Azkar ¹	CMI	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri-Ederra ¹	HLE	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri-Gorri ¹	HLG	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri-Luze ¹	CXI	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri-Urdina ¹	HMZ	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Ihuri Urdina ¹	TIL	Compañia Naviera "Hurri," Bilbao	300, 600	P G	..	..	..	Spain
Iuka ⁹⁹	NEVR	Navy	300, 600	P G	..	..	..	United States of America
Iyar ⁴⁰	—	Aktieselskabet det Forende Dampskibsselskab, Copenhagen	300, 450, 600, 800	—	..	..	..	Denmark
Iyer Heath ²¹	XWB	Bishop Navigation Co., Ltd., Montreal (P.Q.)	300, 600	P	..	..	..	Canada
Ivenia ¹	SJW	Rederiktablaget Svenska Lloyd, Gothenburg	300, 600	P	..	..	..	Sweden
Ivy ⁹⁹	NAKV	Navy	300, 600	P G	..	..	..	United States of America
Iwami ¹	JUD	Navy	—	O	..	..	..	Japan
Iwate ¹	JRF	Navy	—	O	..	..	..	Japan
Iwate Maru ¹	JOI	Teikoku Kisen Kaisha	300, 600	P G	..	..	..	Japan
Iwatesen Maru ¹	JASA	Mitsui Bussan Kaisha	300, 600	P G	..	..	..	Japan
Ixia ¹¹	GCNF	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G	..	..	..	Great Britain
Ixon ¹⁹	GRZ	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 450, 600	P G	..	..	..	Great Britain
Iyo Maru ¹	JPO	Zugadi y Compañia, Bilbao	300, 600, 1,800	P G	..	..	..	Japan
Izaro ¹	TIJ	Compañia Navegacion Benegolea, Bilbao	300, 600	P G	..	..	..	Spain
Izarra ¹	CXD	Hollandsche Stoomboot Maatschappij, Amsterdam	300, 600	P G	..	..	..	Spain
Jaarstroom ¹	TVT	Lage & Irmãos, Rio de Janeiro	300, 600	P G	..	..	..	Holland
Jabiru	LTB	Standard Oil Co. of N.Y., Incorp.	300, 600	P G	..	..	..	Great Britain
Jaboatão ¹³	SSI	26 Broadway, New York (N.Y.)	300, 450, 600	P G	..	..	..	Brazil
J. A. Bestwick ^{a 181}	KJN	Stoomvaart Maatschappij Rotterdam	300, 600, 800	P G	..	..	..	United States of America
Jacatra ¹	PFX	damsche Lloyd, Rotterdam	300, 600	P G	..	..	..	Holland
Jacinto Suárez ¹	TJF	Jacinto Suarez, Bilbao	300, 600	P G	..	..	..	Spain
Jackson ⁹⁷	KIKC	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	..	United States of America
Jackson GJKN ¹⁰	GJKN	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	..	Great Britain
Jacksonville ⁹⁷	KOJG	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	..	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumperelegram.	
Jacob Bagge	SBP	—	Navy	—	O ³⁹	—	—	—	Sweden
Jacob Christensen ¹	ATZ	125	(Amateur) Jacob Christensen, Bergen	300, 450, 600	P G	X	0.40	4.00	Norway
Jacob Jones ¹⁰	NEPZ	—	Navy	300, 600	P G	N	0.20 ¹¹² 0.40 ¹¹²	—	United States of America
Jacob Luckenbach	KDXE	300	Luckenbach Steamship Company	300, 600 , 1,800	P G	X	0.20	—	United States of America
Jacob T. Kopp ²	DKVS	150	American Steamship Company	300, 600	P G	X	0.10 ¹¹⁹	—	United States of America
Jacob Schrödter ³⁵	DHB	200	Bureau Wijsmuller Scheepvaart	300, 600	P G	X	0.40	4.00	Germany
Jacob Van Heemskerck ¹	HEC	200	Transport en Scheepvaart, Maatschappij, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Jacob Van Heemskerck	PAL	—	Navy	600	O ³⁹	—	—	—	Holland
Jacona ⁹⁷	WQUU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Jacox ¹⁰³	KEML	200	U.S. Shipping Board, Washington (D.C.)	300, 400, 600	P G	X	0.40	—	United States of America
Jacques Cartier ¹	FTJ	400	Compagnie Générale Transatlantique, Paris	300, 600	P G	— ²⁷	0.40	—	France
Jaculy ²	PPL	200	Companhia Commercio E. Navegação, Rio de Janeiro	300, 500, 600	P G	N	0.40	—	Brazil
Jacov Sverdlow ¹⁹	XHH	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Jadden ^{9 101}	KORM	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Jade ¹	AMI	—	Navy	—	O	N	—	—	Germany
Jaffa ¹	SGQ	250	Rederiaktiebolaget Sverige-Levanten, Gothenburg	300, 600	P	o800 to o830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Jagersfontein ¹	HEJ	250	Nederland Zuid - Afrikaansche Stoomvaart, Maatschappij, Holland-Zuid Afrika Lijn, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Jaguaraõ	SOJ	30	Navy	100	— ¹⁶	—	0.40	—	Brazil
Jaguaripe ²	PPK	200	Companhia Commercio e Navegação, Rio de Janeiro	300, 500, 600	P G	N	0.40	—	Brazil

Line	Ship	Tonnage	Company	Port of Origin	Destination	Agent	Remarks
1	Jaime I.	550	Alvay	Spain	Spain	3,00	
2	Faime Girona	250	ECI	Holland	Holland	—	
3	Jakobs	250	PBU	Denmark	Denmark	0,40	
4	Jakob Mærsk	250	OIMA	United States of America	United States of America	0,40	
5	Jalapa	—	KDCW	India	India	0,40	
6	Jalapalaka	—	VWDB	India	India	0,40	
7	Jalaputra	135	VWDC	India	India	0,40	
8	Jalatarang	—	GJLK	Great Britain	Great Britain	0,40	
9	Jalavihar	250	VWDF	India	India	0,40	
10	Jalaviyaya	120	VWDG	India	India	0,40	
11	Jamaica	130	YSI	Great Britain	Great Britain	0,40	
12	J. A. McKee	200	CHX	Canada	Canada	0,40	
13	James B. Duke	300	KUSQ	United States of America	United States of America	0,40	
14	James K. Paulding	—	NUJM	United States of America	United States of America	0,40	
15	James McGee	300	KTP	United States of America	United States of America	0,40	
16	James Otis	100	KDCD	United States of America	United States of America	0,40	
17	James P. Walsh	150	KDXW	United States of America	United States of America	0,10	
18	James S. Whitney	200	WPW	United States of America	United States of America	0,20	
19	Jamesstown	300	KOC	United States of America	United States of America	0,20	
20	J. A. Moffett	300	WRE	United States of America	United States of America	0,40	
21	J. A. Moffett, Jr.	300	KDTU	United States of America	United States of America	—	
22	Jan	200	OGIA	Denmark	Denmark	0,40	
23	Jan Breydel	100-150	ONJ	Belgium	Belgium	0,40	
24	Jan Pieterszoon Coen	350	PFL	Holland	Holland	0,40	
25	Jan van Rijswijk	100-150	ONZ	Belgium	Belgium	0,40	
26	Jan V. Nassau	200	PXX	Holland	Holland	0,40	
27	Janewlew	200	KDFS	United States of America	United States of America	0,40	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Jaquet ¹⁰ June 1 ¹	ESR UMD	150 200	Société Auxiliaire d'Importation et de Transport, 33, Rue d'Amsterdam, Paris	300, 600 300, 600	P G P G	X X	0.40 0.40	—	Great Britain France
Jaquet ¹⁰ July at SGX ¹	GCSR SGX	220 350	Åktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg, Sweden	300, 600 300, 600	P G P	X 0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40 0.40	4.00	Great Britain Sweden
Japan VUG ¹⁵	VUG	170	British India Steam Navigation Co., Ltd.	300, 600	P G	X	0.40	—	India
Japan Arrow ^{2 131}	KDHO	300	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Jacques-Cœur Jacques Fraissinet ¹	FAJC FRJ	— 200	Navy Fraissinet & Cie. (Compagnie Maritime de Navigation à Vapeur), Marseilles	300, 800 300, 600	P G P G	N X	0.05 0.40	—	France France
Jarlet ¹	FPL	—	Compagnie de Navigation Paquet, Marseilles	—	P G	N	0.40	—	France
Jarvis ⁹⁹	NIB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Jason GBMW ⁷¹	GBMW	—	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	X	0.40	—	Great Britain
Jason DJO ²⁵ Jason LEL ¹	DJO LEL	200 110	(Armateurs) A S Norsk Bjergingskompani, Christiania Navy	300, 450, 600 300, 600	P G P G	X X	0.40 —	4.00	Germany Norway
Jason NNB ⁹⁹	NNB ⁹⁹	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Jason PYB ¹	PYB	150	Koninklijke Nederlandse Stoomboot, Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Jata Mendi ¹	HMS	200	Sota y Aznar, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Jativa ²	EEL	100	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Jaumar d'Urgell ¹	EFZ	150	Hijos de Jose Taya, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Java ¹⁰	—	—	Akti-selskabet det Ostasiatiske Kompagni, Copenhagen	—	—	—	—	—	Denmark
Java PGR ¹	PGR	200	Stoomvaart Maatschappij Nederland	300, 450, 600	P G	X	0.40	4.00	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Jehangir ..	BRB	—	Lan Sin Chuen ..	—	—	—	—	—	Hong Kong
Jekri ¹³ ..	BHD	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	Great Britain
Jekyl ¹³ ..	KEBS	300	Aktieselskabet Dampskibsselskabet	300, 600	P G ..	X	0.40	—	United States of America
Jelling ⁴⁸ ..	OIY	300	Danebrog, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Jennie R. Morse ⁹⁷ ..	KUNN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	—	0.40	—	United States of America
J. E. O'Neill ^{9 121} ..	KSB	300	Atlantic Refining Co., 3, 144, Passyunk Ave., Philadelphia (Pa.)	300, 600	P G ..	X	0.40	—	United States of America
Jephtha ⁸⁷ ..	KDFV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Jequitinhonha ¹⁵ ..	PUP	150	Companhia Navegação Bahiana, São Salvador (Bahia)	300, 600	P G ..	N	0.40	—	Brazil
Jerônimo Ibrahim ¹ ..	TLI	150	Luis Ibran, Oviedo ..	300, 600	P G ..	N	0.30	—	Spain
Jersey City ¹³ ..	GDRM	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Jerseymoor ¹⁹ ..	ENK	135	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Jervaulx Abbey ¹⁹ ..	ZOW	—	—	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Jesric ¹⁹ ..	OCC	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Jessie ¹ ..	LWA	400	(Amateurs) Louis Wetlesen, Christiania	300, 600	P G ..	X	0.40	—	Norway
Jevpore ¹⁹ ..	GDBY	—	—	300, 600	P G ..	X	0.40	—	Great Britain
J. Fletcher Farrell ^{9 121} ..	KDHR	300	Sinclair Navigation Company, 120, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
J. F. Penrose ¹¹⁴ ..	KUQN	150	National Oil Transport Company, Orange (Texas)	300, 450, 600	P G ..	X	0.40	—	United States of America
J. Frater Taylor ²¹ ..	VGJB	200	Algona, Central and Hudson Bay Ry. Co., Sault Ste. Marie (Ont.)	300, 600, 800	P ..	— ²⁷	0.40	—	Canada
J. H. G. Haggarty ²¹ ..	CKG	200	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P ..	— ²⁷	0.40	—	Canada
Jim Butler ¹ ..	UIY	100	Compagnie du Bolso, 56, Rue de Province, Paris	300, 600	P R ⁶⁴ ..	X	—	—	France
Jim Sid ..	KUZD	150	Gulf Barge and Towing Company, One and a half Magnolia Sts., New Orleans (La.)	300, 600	P G ..	X	—	—	United States of America

Ship	Company	Port of Origin	Port of Destination	Passenger Capacity	Passenger Class	Passenger Rate	Passenger Notes	Passenger Remarks
Jinsho Maru ¹	Taiyo Kisen Kaisha (Oriental Steamship Company)	Yokohama	Manila	400	P G	—	0.40	Japan
Jintsu	—	—	—	—	—	—	—	—
J. J. Sister ²	—	—	—	180	O	—	—	Japan
J. J. Sullivan ^{9 131}	—	—	—	150	P G	3.00	0.30	Spain
J. L. Reiss ^{9 131}	—	—	—	150	P G	—	0.10 ¹¹⁹	United States of America
J. M. Danziger ^{9 131}	—	—	—	150	P G	—	0.10	United States of America
J. M. Guffrey ¹²⁸	—	—	—	300	P G	—	0.40	United States of America
J. N. Pew ^{9 131}	—	—	—	200	P G	—	—	United States of America
Joachim Zalc ¹⁰	—	—	—	—	P G	—	0.40	United States of America
Joaquin del Piñazo ¹	—	—	—	100-150	O	—	—	Norway
Joaquin Pujol ¹	—	—	—	150	P G	—	0.40	Belgium
Joazeiro HQB ¹	—	—	—	100	—	—	—	Spain
Joazeiro	—	—	—	200	P G	—	0.30	Spain
Johansen ¹	—	—	—	100	P G	—	0.40	France
Joessel	—	—	—	150	P G	—	0.40	Brazil
Joffre ¹¹	—	—	—	—	P G	—	0.40	Holland
Johan de Witt ¹	—	—	—	70	P G	—	0.05 ⁸²	France
Johanna ¹	—	—	—	—	P G	—	0.15 ⁸²	Great Britain
Johanna Blumberg ²⁵	—	—	—	Day	P G	—	—	Holland
Johanna Smith ^{9 131}	—	—	—	500	P G	—	—	—
Johanne Dybwad	—	—	—	Night	P G	—	—	—
Johannes C. Russ ³⁵	—	—	—	1,000	P G	—	—	—
Johansson ³⁹	—	—	—	50-75	P G	—	—	—
John Ludw Mowinckel ¹	—	—	—	200	P G	—	—	—
John Adams ^{9 131}	—	—	—	150	P G	—	—	—
John Blumer ¹	—	—	—	300	P G	—	—	—
John C. Kirkpatrick	—	—	—	200	P G	—	—	—
John D. Archbold	—	—	—	150	P G	—	—	—
John D. Edwards ¹⁰²	—	—	—	300	P G	—	—	—
John D. Rockefeller ^{9 131}	—	—	—	300	P G	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Remarks.
							Per Word.	Minimum per Radiogram.	
John Eng ²	KIRS	200	James Botts	300, 600	P G	X	0.40	—	United States of America
John Englis ¹⁷	KDDJ	100-1,000	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	X	0.40	—	United States of America
John F. Hylan ²	KUSM	—	City of New York, Police Dept., New York (N.Y.)	—	P G	—	—	—	United States of America
John Francis Burns ⁹⁸	NIGQ	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
John Harrison ¹⁹	LSI	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 300, 600	P G	X	0.40	—	Great Britain
John Jay	KUXR	—	American Steamship Company	—	P G	X	0.10 ¹¹⁹	—	United States of America
John J. Boland ²	KDWB	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
John M. Connelly ¹⁰³	KJEI	300	Eastern Telegraph Co., Ltd.	300, 600	P	—	0.40	—	United States of America
John Pender ⁷¹	MEF	200	North American S.S. Co.	300, 450, 600, 300, 600	P G	X	0.20	—	United States of America
John P. Reiss ^{2 121}	KUTM	—	American Nauxite Co.	—	P G	X	0.20	—	United States of America
John R. Gibbons ^{9 131}	KTKL	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	India
John Roach ^{9 131}	KOSN	—	Mirza Mohamed Shiraze, Bombay	300, 450, 600	P G	X	0.40	—	United States of America
John Sanderson ²	VWBN	60	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.10 ¹¹⁹	—	United States of America
Johnson City ¹⁰³	KIKD	300	Pioneer S.S. Company	300, 600	P G	X	0.40	—	United States of America
John Stanton ^{9 131}	KDXT	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
John Stevens ^{97, . .}	KDCM	700	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Johnstown ¹⁹	BTW	175	—	300, 600	P G	X	0.40	—	Great Britain
John W. Mackay ¹⁹	GFXK	—	—	300, 450, 600, 2,100, 2,200, 2,400	P G	X	0.40	—	Great Britain
John Worthington ^{9 131}	KDMN	300	Standard Oil Company of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
John W. Wells	KOCR	200	Charles R. McCormick & Company	300, 600	P G	X	0.10 ¹¹¹	—	United States of America
John ^{9 131}	KUVT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Jolly Is. ^{92 19}	EPH	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Jonat ⁹	KUGT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America

Ship	Code	Port	Company	Value	Notes	Country
Jomsborg ⁴⁰	OHBA	300	Aktieselskabet Dampskibsselskabet	300, 150, 800		United States of America
Jourancy ²	KSEU	150	Dannebrog, Copenhagen	300, 450, 600		Germany
Jonia ²⁵	DJI	200	Pocahontas Fuel Co., Incorp., 131, State St., Boston (Mass.)	300, 450, 600		Spain
Jorge Juan ²	EEJ	180	Compañia Transmediterranea, Barcelona	300, 600		Brazil
José Bonifacio	SNJ	—	Navy	300, 600		Spain
José Estrech ¹	TOF	100	José Atefuz, Bilbao	300, 600		Spain
Joséfa TMS ¹	TMS	100	Compañia Cantabrica, S. Sebastian	300, 600		Poland
José Pilsudski ¹	AXI	250	Polish Navigation Company	300, 600		France
Joselle ¹	FAW	180	Société les Chalutiers de La Rochelle, La Rochelle	300, 600		United States of America
Joseph G. Butler, Jr. ^{9 131}	KDXU	150	Pioneer S.S. Company	300, 600		United States of America
Joseph Henry ^{2 131}	WMT	150	Government, Washington (D.C.)	600		United States of America
Joseph M. Cudahy ^{9 131}	KDMT	150	Sinclair Navigation Co., 120, Broad- way, New York (N.Y.)	300, 600		United States of America
Joseph R. Parrott ^{9 131}	KJP	150	Florida E. Coast Car Ferry Co., 26, Broadway, New York (N.Y.)	300, 450, 600		United States of America
Joseph Seep ^{9 131}	KDJV	300	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600		Spain
José Taya ¹	HNR	150	Hijos de José Taya, Barcelona	300, 600		Spain
José Villalonga ¹	CMF	250	Altos Hornos de Vizcaya, Bilbao	300, 600		Denmark
Josey ⁴⁰	OHN	200	Aktieselskabet Dampskibsselskabet Myren, Copenhagen	300, 450, 600, 800		United States of America
Josiah Macy ^{9 131}	KEX	300	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 600		Italy
Josto ¹⁷	ITY	140	Sicilia Società di Navigazione, Rome	300, 600		United States of America
Jota (La)	KDXF	—	W. W. Wilson	300, 450, 600		Norway
Jotunfjell ¹	AWA	Day 500 Night 1000	(Armateurs) Olsen & Ugelstad, Christiania	300, 450, 600		United States of America
Jouett ⁹⁹	NIE	—	Navy	300, 600		United States of America
J. R. Gordon ⁹⁷	KOML	—	Union Sulphur Co., 82, Beaver St., New York (N.Y.)	300, 600		United States of America
J. T. Hutchinson ^{9 131}	KDXX	150	Pioneer S.S. Company	300, 600		United States of America
Juan de Abrisqueta ¹	ECF	300	Abrisqueta y Compañia, Ltd., Bilbao	300, 600		Spain
Juan Manuel Urquijo ¹	CMP	150	Compañia Naviera Ferros, S.A., Oviedo	300, 600		Spain
Juan Maragall ¹	HLJ	150	Compañia Transmediterranea, Barcelona	300, 600		Spain
Jubarte ¹	UKP	180	Gabriel Trousselle, Boulogne-sur- Mer	300, 600		France
Jufuku Maru ¹	JKK	500	Kokusai Kisen Kaisha	300, 600		Japan
Juiuy ¹	LLD	—	Navy	450, 600		Argentine Republic
Jules Elby ¹	ULN	250	Pêcheries de France, 16, Rue des Pyramides, Paris	300, 600		France
Jules-Ferry	FA J	—	Navy	300, 800		France
Jules Henry ¹	FBI	600	Vimont & Cie, Marseilles	300, 600		France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Jules-Michelet ..	FAJM	—	Navy	300, 800	P G ..	N	0.05	—	France
Julia Luckenbach ⁸⁷	KGZ	300	Luckenbach Co., Incorp., 44, Whitehall St., New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Juliana ¹ ..	EDX	150	Compañia Barcelonesa de Navegacion, Barcelona	300, 600	P G ..	N	0.40	4.00	Spain
Julius Kessler ³⁰ ..	VGBS	100	Sugar Products Co., New York (N.Y.)	300, 600	P G ..	— ²⁷	0.40	—	Canada
Junièges ¹ ..	FLJ	180	Worms & Cie., Boulevard des Strasbourg, Le Havre	300, 450, 600	P G ..	X	0.40	—	France
Juneau ⁹⁷ ..	WAMI	100	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 600	P G ..	X	0.20	—	United States of America
Junee ¹ ..	VZF	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Jungshoved ⁴⁰ ..	OGHA	300	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450, 600 , 800	P G ..	X	0.40	4.00	Denmark
Juniata KQJ ¹⁰³ ..	KQJ	150	Merchants and Miners Transportation Co., Light and German St., Baltimore (Md.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Juniata WCB ^{9 131} ..	WCB	150	Great Lakes Transit Corporation, Foot of Class Street, Detroit (Mich.)	300, 450, 600	P G ..	N	0.20	—	United States of America
Junin ¹⁹ ..	GJL	200	—	300, 600	P G ..	0900 to 1100 2000 to 0200	0.40	—	Great Britain
Junio IUF ¹⁷ ..	IUF	140	—	300, 600	P G ..	X	0.40	—	Italy
Junio PKW ¹ ..	PKW	150-200	Nederlandsch Indische Tankstoomboot, Maatschappij	300, 600	P G ..	X	0.40	4.00	Dutch East Indies
Junio PXZ ¹ ..	PXZ	150	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Jupiter CMJ ¹ ..	CMJ	150	Compañia Anonima Maritima Union, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Jupiter DJP ²³ ..	DJP	200	Louis Dero, Quai Casimir Delavigne, Le Havre	300, 600	P G ..	X	0.40	4.00	Germany
Jupiter FBJ ¹ ..	FBJ	350	Société les Affréteurs Réunis, Paris	300, 600	P G ..	X	0.40	—	France
Jupiter FIL ¹ ..	FIL	300	—	300, 600	P G ..	N	0.40	—	France

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Remarks.
							Per Word.	Minimum per Radio telegram.	
Kaggefos ¹	TSV	150-200	(Amateurs) Otto & Thor Thoresen A S. Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Kageri ¹	UCS	200	Transports Maritimes de l'Etat ..	300, 600	P G ..	X	0.40	—	France
Kagi Maru ¹	JKG	300	Osaka Shosen Kaisha (Osaka)	300, 600	P G ..	X	0.40	—	Japan
Kaian Maru ¹	JIP	400	Mercantile Steamship Company Katsuta Kisen (Kabushiki) Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kaipoi ³	VLH	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P G ..	0800 to 1100	0.20	—	New Zealand
Kaifuku Maru ¹	JBF	400	Katsuta Kisen (Kabushiki) Kaisha	300, 600 , 1,800	P G ..	1400 to 1700 2000 to 2400	0.40	—	Japan
Kaigen Maru ¹	JAQ	150	Mitsui Bussan Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kaijo Maru ¹	JFBA	200	Osaka Shosen Kaisha (Osaka)	300, 600	P G ..	X	0.40	—	Japan
Kaikorai ²¹	XJW	—	Mercantile Steamship Co. Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G ..	X	0.40	—	Great Britain
Kaikoura ¹⁹	MRS	230	—	300, 600	P G ..	X	0.40	—	Great Britain
Kaikyu Maru ¹	JKK	400	Katsuta Kisen (Kabushiki) Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kakunawawa ²¹	GHVT	120	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	P G ..	X	0.40 ²¹	—	Great Britain
Kaiping ¹⁹	YBB	145	—	300, 630	P G ..	X	0.40	—	Great Britain
Kaiser-I-Hind ¹⁹	MSI	230	—	300, 600 , 2,100, 2,200 c.w.	P G ..	X	0.40	—	Great Britain
Kaiser DKA ²³	DKA	120	Hamburg-Amerika Linie, Hamburg	300, 450, 600	P G ..	X	0.40	—	Great Britain
Kaiser DKQ ²³	DKQ	600	Dienstelle Der Atmoralitat, Ham- burg	300, 600	P G ..	X	0.10	4.00	Germany
Kaisho Maru ¹	JEO	400	Katsuta Kisen (Kabushiki), Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.12	—	Germany
Kaitangata ³	VLI	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P G ..	X	0.40	—	Japan
Kaitoke ²¹	EYV	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G ..	X	0.20	—	New Zealand
							0.40	—	Great Britain

Ship	VLT	Lat	Long	Company	Radio	Frequency	Power	Notes
Kaituma ¹	Union S.S. Co. of N.A., Ltd.	250	..	300, 600	Great Britain
Kaiwarra ²¹	Operated by the Amalgamated Wireless Ltd. (Australasia)	..	..	300, 600	Denmark
Kaj ¹⁰	Dampskibsselskabet Myren, Copenhagen	250	..	300, 450, 600, 800	Estonia
Kajak ¹	90	..	300, 600, 1,300	Japan
Kako ¹	Navy	..	..	..	United States of America
Kalen ²	U.S. Shipping Board, Washington (D.C.)	..	..	300, 600	Estonia
Kalevipoeg ¹	100	..	300, 450, 600	Norway
Kallorli ²³	(Armateur) D. Steen, Christiania	200-250	..	300, 600	Great Britain
Kalimba ¹⁹	Trafikaktiebolaget Grängesberg-Oxelösund, Stockholm	150	..	300, 600	Sweden
Kalix ¹	250	..	300, 600	United States of America
Kalk ²⁹	Navy	..	..	300, 600	Greece
Kalliron Sapari ¹	Jean Papas, Piræus	150-200	..	300, 600	Sweden
Kalmár ¹	Angbatsaktiebolaget Kalmarsund, Kalmar	250	..	300, 600	United States of America
Kalmnia ²⁹	Navy	..	..	300, 600	Greece
Kalomo ¹⁹	160	..	300, 600	Great Britain
Kalvau ¹⁹	200	..	300, 600	Greece
Kalyso Vergottis ¹	Vergottis	150-200	..	300, 600	Japan
Kamakura Maru ¹	Nippon Yusen Kaisha (Japan Mail Steamship Company)	400	..	300, 600, 1,800	Holland
Kanbangau ¹	Stoomvaart Maatschappij Nederland, Amsterdam	250	..	300, 450, 600, 800	Great Britain
Kambole ³⁰	100	..	300, 450, 600	United States of America
Kamenetz Podolsk ¹⁹	U.S. Shipping Board, Washington (D.C.)	300	..	300, 600	Norway
Kamesit ¹⁰³	(Armateurs) F. S. Thom & Co., Christiania	200	..	300, 600	Great Britain
Kamiford ¹	300, 600	Japan
Kamir ³⁰	Nippon Yusen Kaisha (Japan Mail Steamship Company)	100	..	300, 450, 600	Gibraltar
Kano Maru ¹	450	..	300, 600	Japan
Kanouraska ¹⁹	190	..	300, 600	..
Kanabec ¹	200	..	300, 600	..
Kanagawa Maru ¹	Nippon Yusen Kaisha (Japan Mail Steamship Company)	400	..	300, 600, 1,800	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Kanak ² ..	KOT	150	Alaska Packers' Association, Wells Fargo Building, San Francisco (Cal.)	300, 400, 600	P R ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kanawha KYA ² ..	KYA	200	Black Star Line	300, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kanawha NND ..	NND	—	Navy.	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kandahar ¹⁰ ..	MAB	190	—	300, 600	P G ..	X	0.40 ¹¹¹ 0.20 ¹¹²	—	Great Britain
Kane ¹⁰ ..	NULM	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kangaroo ¹ ..	VHM	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ¹¹¹ 0.40 ¹¹² 0.40 ¹¹²	—	Australian Commonwealth
Kangan ¹ ..	PGP	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Kanguro .. ¹⁰¹ ..	CLQ	—	—	300, 600	O ..	N	—	—	Spain
Kankée ..	NUMZ	—	—	300, 600	P G ..	—	—	—	United States of America
Kanna ³ ..	VLO	150	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20 ¹¹¹ 0.20 ¹¹²	—	New Zealand
Kanowna ¹ ..	VHD	250	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ¹¹¹ 0.40 ¹¹² 0.40 ¹¹²	—	Australian Commonwealth
Kansas MRW ¹⁰ ..	MURW	150	—	300, 600	P G ..	—	0.40	—	Great Britain
Kansas NIO ¹⁰ ..	NIO	—	—	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kantara (El) ¹ ..	FNK	300	Société des Services Contractuels des Messageries Maritimes, Paris (Armateurs) Carl Wildhagen & Co., Sandefjord	300, 600	P G ..	— ²⁷	0.40	—	France
Kapland ¹ ..	AUA	200	(Armateurs) Carl Wildhagen & Co., Sandefjord	300, 600	P G ..	X	0.40	4.00	Norway
Kapohna ¹ ..	ATI	200	(Armateurs) Carl Wildhagen & Co., Sandefjord	300, 600	P G ..	X	0.40	4.00	Norway
Kapirino ¹ ..	ATY	200	(Armateurs) Carl Wildhagen & Co., Sandefjord	300, 600	P G ..	X	0.40	4.00	Norway
Kapurthala ¹⁰ ..	GCDT	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Kara ¹⁰ ..	GDJL	100	—	300, 450, 600	P G ..	X	0.40	—	Great Britain

Karachi Maru ¹	JKH	500	Kokusai Kisen Kaisha	300, 600	P/G	0800 to 1100 1400 to 1700 2000 to 2400	0.40 0.40 ³⁸ 0.40	Japan
Kara Deniz ²	VUZ	300	—	600	O ^a	X	0.40	India
Karagola ¹⁹	ZNX	260	—	300, 600	P/G	X	0.40	Great Britain
Karamea ¹⁹	MSB	180	—	300, 600	P/G	X	0.40	Great Britain
Karapara ¹⁹	YST	240	—	300, 600	P/G	X	0.40	Great Britain
Karasaki ¹	JUV	—	Navy	—	O	—	—	Japan
Karimata ¹	PGQ	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 600	P/G	X	0.40	Holland
Karimoen ¹	PGW	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P/G	X	0.40	Holland
Karlsvik ¹	SLN	250	Norrköpings Rederiaktiebolag, Norrköping	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	Sweden
Karnala ¹⁹	MTF	220	—	300, 600	P/G	X	0.40	Great Britain
Karnöy ¹	ASG	150-175	(Armateur) John K. Haaland, Haugesund	300, 600	P/G	X	0.40	Norway
Karnak ¹⁹	YKV	190	—	300, 600	P/G	X	0.40	Great Britain
Karöa ¹⁹	BDB	230	—	300, 600	P/G	X	0.40	Great Britain
Karonga ¹⁹	GFWC	—	—	300, 450, 600	P/G	X	0.40	Great Britain
Karoola ¹	VHE	240	—	300, 600	P/G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸ 0.40 ⁸ 0.40 ⁸	Australian Commonwealth
Karori ³	VMB	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P/G	X	0.20	New Zealand
Karroo ¹⁹	GNS	160	—	300, 600	P/G	X	0.40	Great Britain
Karuah ¹	VZH	150	—	300, 600	P/G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸ 0.40 ⁸ 0.40 ⁸	Australian Commonwealth
Kasado Maru ¹	JKT	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P/G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Kasama ¹⁹	GBP	145	—	300, 600	P/G	X	0.40	Great Britain
Kasara ¹⁹	BLD	160	—	300, 600	P/G	X	0.40	Great Britain
Kasenga ¹⁹	YUR	215	—	300, 450, 600	P/G	X	0.40	Great Britain
Kashgar ¹⁹	YVL	210	—	300, 600	P/G	X	0.40	Great Britain
Kashima ¹	JGG	—	Navy	—	O	—	—	Japan
Kashima Maru ¹	JKX	450	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P/G	N	0.40	Japan
Kashmir ¹⁹	YZN	210	—	300, 600	P/G	X	0.40	Great Britain
Kashu Maru ¹	JOU	400	Kokusai Kisen Kaisha	300, 600	P/G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Kassala ¹⁹	ZYD	—	—	300, 600	P G	X	0.40	—	Great Britain
Kastalia ¹⁹	GCLJ	—	—	300, 600	P G	X	0.40	—	Great Britain
Kasuga Maru ¹	JKO	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kasub ¹	AXE	—	Navy	300, 450 , 600, 800	O	N	—	—	Poland
Katadyomenon ¹	SZGS	—	Navy	—	O	—	—	—	Greece
Katadyomenon ²	SZHS	—	Navy	—	O	—	—	—	Greece
Katadyomenon ³	SZIS	—	Navy	—	O	—	—	—	Greece
Katadyomenon ⁴	SZJS	—	Navy	—	O	—	—	—	Greece
Katadyomenon ⁵	SZKS	—	Navy	—	O	—	—	—	Greece
Katadyomenon ⁶	SZLS	—	Navy	—	O	—	—	—	Greece
Katanga ¹⁹	BOZ	160	—	300, 600	P G	X	0.40	—	Great Britain
Katata ¹	JWH	150-200	Lykiardopoulo	300, 600	O	—	—	—	Japan
Kate ¹	SWZ	300	Philippine Vegetable Oil Company	300, 450 , 600	P G	—	0.40	4.00	Greece
Katherine ⁹	KIZK	—	—	—	P G	—	0.40	—	United States of America
Katharine Park ²¹	GRU	140	Pensacola Trading Co., Ltd.	300, 600	P G	—	0.40	—	Great Britain
Kathiawar ¹⁹	GCPR	170	—	300, 600	P G	—	0.40	—	Great Britain
Kathlamba ¹⁹	GJLR	170	—	300, 600	P G	—	0.40	—	Great Britain
Katie ¹⁹	ZRV	145	—	300, 600	P G	—	0.15 ⁸²	1.50 ⁸²	Great Britain
Katino A. Lenou ¹	THI	200	A. G. et Lemos, Chios	300, 600	P G	—	0.40	4.00	Greece
Katou ³	VIN	250	Union S.S. Co., of N.Z., Ltd.	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1730 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.20 ⁸ 0.40 ⁸	—	New Zealand
Katoomba ¹	VHN	300	—	300, 600	P G	—	—	—	Australian Commonwealth
Katori ¹	JGF	—	Navy	—	O	—	—	—	Japan
Katori Maru ¹	JKR	450	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600 , 1,800	P G	X	0.40	—	Japan
Katrina Luckenbach ⁸⁷	KWU	300	Luckenbach Steamship Company	300, 450 , 600	P G	X	0.40	—	United States of America
Kattugat ¹⁹	OGP	80	Aktieselskabet, Ein. Z. Svitzers Bjergruinsontrepise, Copenhagen	— 300, 600	P	—	0.40	4.00	Denmark
Katuna ¹⁹	GCPI	150	Maatschappij Stoomschip Katwijk, Rotterdam	300, 600	P G	X	0.40	—	Great Britain
Katwijk ¹	TYP	200	—	300, 450 , 600 , 800	P G	X	0.40	4.00	Holland

Kern ² Kawachi Maru ¹	JPC	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	Japan
Kawachi ²¹ Kawachi ¹	GC DK PF D	200	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 450, 600 300, 600	P G P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	Great Britain Holland
Kayser ²⁹ Kaysueka ¹⁰³	GBLY KOQS	100 300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600 300, 600	P G P G	X X	Great Britain United States of America
Kazembe ¹⁹ Kear ¹	GYQ SWE	145 100-150	The National Steam Navigation Co., Ltd., of Greece, Athens	300, 600 300, 600	P G P G	X N	Great Britain Greece
Kearny ²⁷	KOPR	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Kearsarge ²⁹	NIP	—	Navy	300, 600	P G	N	United States of America
Kents ¹⁹ Kediri ¹	GFOK PFY	150	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 600 300, 600, 800	P G P G	X X	Great Britain Holland
Kedje ¹	OLJ	150	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 450, 600, 800	P G	X	Holland
Keelung ²⁹	GCLT	140	—	300, 600	P G	X	Great Britain
Keenun ²¹	ZKP	—	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	Great Britain
Keewatin ²¹	VGC	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— ²⁷	Canada
Keihuku ¹	KUPV	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	United States of America
Keihuku Maru ¹	JHT	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	Japan
Keihaven ¹	TYF	150	Maatschappij Stoomschip Kei- haven, Rotterdam	300, 600	P G	X	Holland
Keihin Maru ¹	JCK	400	Tatsuuma Shokai	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	Japan
Keikarung ²¹	LTD	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G	N	Great Britain
Keikettient ¹⁰³	KZEA	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Kekoskee ¹⁰³	KDGY	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Kelbergen ¹	PIZ	150	Zuid Hollandische Scheepvaart Maatschappij, Rotterdam	300, 600	P G	N	Holland
Kellet ¹ Kelson ¹⁰² Keltier ¹⁹	GFAR YMD OOQ	— — 150-200	Navy Lloyd Royal Belge, Antwerp	300, 450, 600 300, 600	P G P G P G	X X X	Great Britain Great Britain Belgium
Kelvinbrae ¹⁹ Kelbane Head ¹⁹ Kendal	MFY GBRL GFAS	170 — —	Navy	300, 600 300, 600	P G P G P G	X X —	Great Britain Great Britain Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Kendal Castle ¹⁹	..	300	—	300, 600	P G	X	0.40	—	Great Britain
Keneb ¹⁹	..	150	—	300, 600	P G	X	0.40	—	Great Britain
Kenilworth ¹⁹	..	155	—	300, 600	P G	X	0.40	—	Great Britain
Kenilworth Castle ³⁰	..	350	—	300, 450, 600	P G	N	0.40	—	Great Britain
Kenmare GFCX ¹⁹	..	—	Coast Lines, Ltd.	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Kenmare MXG ¹⁹	..	—	Merlin Shipping Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain
Kennebec ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Kennecott ⁹⁷	..	300	Alaska S.S. Company, 1107, Colman Building, Seattle (Wash.)	300, 450, 550, 600	P G	X	0.20	—	United States of America
Kennedy ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kennemerland ¹	..	200	Koninklijke Hollandsche Lloyd, Amsterdam	300, 600	P G	X	4.00	—	Holland
Kennett ⁹⁹	..	—	Navy	—	P G	—	—	—	Great Britain
Kennison ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kenowis ⁹ 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450 600	P G	X	—	—	United States of America
Kent ¹⁹	..	155	American - Hawaiian S.S. Co., 8, Bridge St., New York (N.Y.)	300, 600	P G	X	0.40	—	Great Britain
Kentuckian ¹⁰³	..	200	Compagnie Générale Transatlantique, Paris	300, 450, 600	P G	X	0.20	—	United States of America
Kentucky FGX ¹	..	200	—	300 600	P G	X	0.40	—	Great Britain
Kentucky GDN	..	150	—	300, 600	P G	X	0.40	—	France
Kentucky NIQ	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Kenuta ¹⁹	..	200	—	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kesauqua ⁹⁹	..	—	—	300, 600	P G	0000 to 1100 2000 to 0200	0.40	—	Great Britain
Keppel	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kerdonis ¹	..	300	Compagnie Générale de Pêche Maritime et d'Approvisionnement en Poisson, 3, Rue Scribe, Paris	300, 600	P G	—	—	—	Great Britain
Kerdonis II ¹	..	180	Société Nouvelle des Chalmiers de	300 600	P G	X	0.40	—	France

Kergroise ¹	..	UMM	225	Maritime et d'Approvisionnement en Poissons, 3, Rue Scribe, Paris	300, 600	P G	..	X	0.40	—	France
Kerhonkson ^{9 131}	..	KUJF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Keriado II	..	FAQ	180	Société Nouvelle des Chalutiers de l'Ouest, La Rochelle	300, 600	P G	..	X	0.40	—	France
Kermelo ¹	..	UMF	300	Compagnie Générale de Pêche Maritime et d'Approvisionnement en Poissons, 3, Rue Scribe, Paris	300, 450, 600	P G	..	X	0.40	—	France
Kernit ¹³¹	..	WMV	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Kernevel ¹	..	UJG	180	Société Nouvelle des Chalutiers de l'Ouest, La Rochelle	300, 600	P G	..	X	0.40	—	France
Keroman ¹	..	UMW	300	Compagnie Générale de Pêche Maritime et d'Approvisionnement en Poissons, 3, Rue Scribe, Paris	300, 450, 600	P G	..	X	0.40	—	France
Kersaint ¹	..	FKR	200	Compagnie des Chargeurs Réunis, 1, Boulevard Malesherbes, Paris	300, 600	P G	..	X	0.40	—	France
Kershaw ¹⁰³	..	KQK	200	Merchants and Miners Transportation Co., Light and German St., Baltimore (Md.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Kertosono ¹	..	OLK	200	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 600, 800	P G	..	X	0.40	4.00	Holland
Keryado ¹	..	UMK	300	Compagnie Générale de Pêche Maritime et d'Approvisionnement en Poisson, 3, Rue Scribe, Paris	300, 600	P G	..	X	0.40	—	France
Keshena ⁹⁷	..	KITR	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Ketchikan ⁹⁷	..	WAE	100	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 600	P G	..	X	0.20	—	United States of America
Kewanee ⁹⁷	..	KIVC	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Kewaydin ⁹⁹	..	NAXN	—	—	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Keyingham ¹⁹	..	BMQ	180	—	300, 600	P G	..	X	0.40	1.00 ⁸⁷	Great Britain
Keynes ¹⁹	..	XFO	300	(Armateur) Knut Knutsen, O.A.S., Haugesund	300, 600	P G	..	X	0.10 ⁸⁷	—	Great Britain
Key West ¹	..	LCQ	435	—	300, 600	P G	..	X	0.40	4.00	Norway
Kharki ¹	..	BRR	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Khartum ¹⁹	..	YLK	—	—	300, 450, 600	P G	..	X	0.40	—	Great Britain
Khiva ¹⁹	..	MGZ	220	—	300, 600	P G	..	X	0.40	—	Great Britain
Khyber ¹⁹	..	MCE	230	—	300, 600	P G	..	X	0.40	—	Great Britain
Kiang-Chien	..	XOC	—	Navy	—	O	..	—	—	—	China
Kiang-Han	..	XQH	—	Navy	—	O	..	—	—	—	China

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Kiang-Li ¹⁷	..	—	Navy	—	O	X	—	—	China
Kiangsu ¹⁷	..	100	Operated by China Navigation Company, Ltd., 8, Billiter Square, London	300, 450, 600	P G	..	0.40	—	Great Britain
Kiang-Yuen	..	—	Navy	—	O	..	—	—	China
Kia Ora ¹⁸	..	180	..	300, 600	P G	0800 to 1100	0.40	—	Great Britain
Kibi Maru No. 6 ¹	..	400	Toyosaki Kisen Kaisha	300, 600	P G	1400 to 1700 2000 to 2400	0.40	—	Japan
Kickapoo ¹⁸	..	—	U.S. Coast Guard	300, 600	P G	X	—	—	United States of America
Kildler ¹⁹	..	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kilderpore ¹⁹	..	—	..	300, 600	P G	X	0.40	—	Great Britain
Kien-An ¹⁹	..	—	Navy	—	O	..	—	—	China
Kien-Kong	..	—	Navy	—	O	..	—	—	China
Kien-Wei	..	—	Navy	—	O	..	—	—	China
Kifuku Maru ¹	..	400	Kawasaki Zosenjo	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kifunosan Maru No. 2 ¹	..	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
K.H. ¹	..	—	Navy	—	O	X	—	—	Japan
Kildonan Castle ¹⁰	..	350	..	300, 450, 600	P G	..	0.40	—	Great Britain
Kilkenny ²	..	100	Bureau of Navigation, Dept. of Commerce, Washington (D.C.)	300, 450, 600	O	..	—	—	United States of America
Killis	..	—	Navy	—	O	..	—	—	Greece
Killorig ²¹	..	150	Operated by Lindsay, Swan, Hunter, Ltd., Kingston (Jamaica)	300, 600	P G	..	—	—	Italy
Killstream ¹	..	200	Hollandische Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	—	—	Holland
Kilty ¹⁹	..	—	Navy	300, 600	P G	X	0.40 ¹¹¹ 0.40 ¹¹²	4.00	United States of America
K. L. Luckenbach ¹⁷	..	300	Luckenbach S.S. Corp., 14, Whitehall St., New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Kimberly ¹⁹	..	—	Navy	300, 600	P G	X	0.20 ¹¹¹	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Kirin Maru ¹	JDX	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kirishina ¹	JGW	—	Navy	—	O	X	—	—	Japan
Kirktown ¹⁹	BKN	145	—	300, 600	P G	—	0.40	—	Great Britain
Kirkwood ¹⁹	EPG	130	—	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Kirwood ¹⁹	MGX	140	—	300, 600	P G	X	0.40	—	Great Britain
Kiron ^{9 181}	KIT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Kirsten Maersk ⁴⁰	OGKA	200	Rederiet A. P. Möller, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Kiruna ¹	SDK	250	Trafikaktiebolaget Grängsberg - Oxelosund, Stockholm	300, 600	—	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	Sweden
Kishacoquillas ⁸⁷	KIFJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Kishu Maru ¹	JFDA	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kishun Maru ¹	JFH	200	Tatsuma Kisen Kabushiki Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kisnop ^{9 181}	KIJK	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Kiso ¹	JLI	—	Navy	—	O	—	—	—	Japan
Kiso Maru ¹	JKJ	400	Tokio Kaun Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kitakami ¹	JLH	—	Navy	—	O	—	—	—	Japan
Kitano Maru ¹	JKN	450	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	X	0.40	—	Japan
Kitchi ⁸⁷	KITV	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Kittegaun ⁸⁷	KITG	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Kittory ⁸⁹	NHW	—	Navy	300, 600	P G	X	0.40	—	United States of America

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Kochi Maru ¹	JOA	400	Teikoku Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kodrus ¹⁹	GDSQ	—	—	300, 450, 600	P G ..	0800 to 1100	0.40	—	Great Britain
Koei Maru ¹	JEK	400	Hiromi Shoji (Kabushiki) Kaisha	300, 600	P G ..	1400 to 1700 2000 to 2400	0.40	—	Japan
Koetei	PLC	100	Navy	300, 600	O ³⁹	—	—	—	Dutch East Indies
Kofuko Maru JFL ¹	JFL	500	Kokusai Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kofuku Maru JBQ ¹	JBQ	400	Hiromi Shoji (Kabushiki) Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kohinur ¹⁹	GJFS	—	—	300, 450, 600	P G ..	N	0.40 ¹¹¹	—	Great Britain
Koka ⁹⁹	NETZ	—	—	300, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Koki Maru ¹	JAIA	400	Hashimoto Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kolda ^{9 121}	KOKX	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	United States of America
Koh ³⁵	DKO	200	—	300, 450, 600	P G ..	N	0.40	4.00	Germany
Kolpino ¹⁹	ODL	120	—	300, 600	P G ..	N	0.15 ⁸³	1.50 ⁸²	Great Britain
Konia Maru ¹	JKL	400	Tetsudoshu Ministry of Railways	300, 600, 1,800	P G ..	0800 to 1100	0.40	—	Japan
Konagata Maru ¹	JDV	300	Yamashita Kamesaburo ..	300, 600	P G ..	1400 to 1700 2000 to 2400	0.40	—	Japan
Komahashi ¹	JUV	—	Navy	—	O	N	—	—	Japan
Komendant Pilsudski	AXA	—	Navy	300, 450, 600	O	—	—	—	Poland
Komura ¹	VZBC	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁹	—	Australian Commonwealth
Konan Maru ¹	IHA	400	Kobe Sanbashi Kaisha	300, 600	P G ..	0800 to 1100	0.40	—	Japan

Kong Harald ¹	LDK	160	Dampskibsselskab, Copenhagen (Armateurs) det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G	0100 to 0300 0700 to 0900 1300 to 1500 1900 to 2100	0.20	2.00	Norway
Kongo ¹	JGU	—	Navy	—	O	—	—	—	Japan
Kongosan Maru ¹	JYQ	400	Mitsui Bussan Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Konia ³⁵	DMV	200	—	300, 600	P G	X	0.40	4.00	Germany
Konigen der Nederlanden ¹	PFV	350	Stoomvaart Maatschappij Nederland, Amsterdam	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	Holland
Konsul Olsen ¹	ATU	200	(Armateurs) Klüver & Co., Christiania	300, 600	P G	X	0.40	4.00	Norway
Konning Gustaf V ¹	SEA	100	— ² Ferry Boat of the Sassnitz-Tralleborg Line	300, 375, 600	P R ⁴⁸	X	—	—	Sweden
Koolonga ¹⁹	GOG	150	—	300, 450, 600	P G	X	0.40	—	Great Britain
Koolonga ³	VZBT	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0300 (ship's time)	0.30 ⁸ 0.40 ⁵	—	Australian Commonwealth
Koonda ¹	VZBD	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Kooringa ¹	VXJ	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Kootenai ^{9 131}	KOGF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.10	—	United States of America
Kooyong ¹	VXH	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Korama ¹⁹	GYV	150	—	300, 600	P G	X	0.40	—	Great Britain
Koranton ¹⁹	GDBN	—	—	300, 600	P G	X	0.40	—	Great Britain
Korea Maru ¹	JVL	500	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600, 1,800	P G	X	0.40	—	Japan
Korean Prince ¹⁹	YRS	—	—	300, 600	P G	X	0.40	—	Great Britain
Koromiko ³	VMD	280	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—	New Zealand
Korrigan III ¹	XBF	200	Compañia del Boleo	300, 600	P G	X	0.40	—	Mexico

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Kosai Maru ¹	JKS	—	Chosen Government	—	— ³⁷	N	—	—	Japan
Kosciuszko ³³¹	KZUE	300	Polish-American Navigation Corp., 206, Broadway, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Kosho ¹	JCMA	400	Harada Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Koshun Maru ¹	JAV	400	Kobe Sambashi Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Koso Maru ¹	JOB	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kosoku Maru ¹	JIO	400	Hiroimi Shoji (Kabushiki) Kaisha	300, 600	P ³⁵	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Kotla ¹⁹	ODM	130	Aktieselskabet Dammskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	X	0.15 ⁸² 0.40	1.50 ⁸² 4.00	Great Britain Denmark
Kotonia ⁴⁰	OHOA	350	Hiroimi Shoji (Kabushiki) Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kotsu Maru ¹	JIG	Day 400	Compagnie des Messageries Maritimes, Paris	300, 600	P G	— ³⁷	0.40	—	France
Kotang-Si ¹	FIG	200	Vereenigde Nederlandsche Scheepvaartmaatschappij Holland-Britsch Indie Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Koudekerk ¹	OLC	200	Compagnie Française de Navigation à Vapeur Cyprien Fabre & Cie., 15, Rue Beaveau, Marseilles	300, 600	P G	X	0.40	—	France
Kouroussa ¹	UCZ	200	—	—	—	—	—	—	—
Koursk ¹⁹	BTB	230	—	300, 600	P G	X	0.40	—	Great Britain
Kovno ¹⁹	ODN	125	—	300, 600	P G	X	0.15 ⁸² 0.20 ⁶ 0.40 ⁸	1.50 ⁸²	Great Britain Australian Commonwealth
Kowarra ¹	CGS	200	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030	—	—	—

Koyo Maru ¹	JKD	400	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	P G	0.40	—	Japan
Krakatan ¹	PGL	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 800, 600	P G	0.40	4.00	Holland
Krasnoarsk ²¹	XUC	—	Gothenburg - South Africa Line, Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P G	0.40	—	Great Britain
Kratos ¹	SFQ	250		300, 600	P	0.40	4.00	Sweden
Kribi ¹	UDA	250	Transports Maritimes de l'Etat (Armateur), Brali Seeberg, Riga	300, 600	P G	0.40	—	France
Krimulda ¹	KCH	120	(Armateur), Den Norske Amerikaline A/S, Christiania	300, 450, 600	P G	0.15	—	Lettonia
Kristianafjord ¹	TTH	150-200	Standard Oil Co. of California, Inc., Sheldon Building, San Francisco (Cal.)	300, 600	P G	0.40	4.00	Norway
K. R. Kingsbury ²¹¹	KDRE	300		300, 600	P G	0.40	—	United States of America
Krkowiak	AXG	—	Navy	300, 450, 600, 800	O	—	—	Poland
Kronborg ⁴⁰	OGGA	300	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	303, 450, 600, 800	P G	0.40	4.00	Denmark
Kronprinsessan Margareta ¹	SFY	350	Rederiaktiebolaget Nordstjernan (Johnson Line), Stockholm, Sweden and Norway-Brazil-Uruguay-Argentine - Chile and Peru Line	300, 600	P	0.40	4.00	Sweden
Kronprins Frederik ⁴⁰	OHDA	200	Aktieselskabet Dampskibsselskabet Pacific, Copenhagen	300, 450, 600, 800	P G	0.40	4.00	Denmark
Kronprins Gustaf Adolf ¹	SFV	350	Rederiaktiebolaget Nordstjernan (Johnson Line), Stockholm, Sweden and Norway, Brazil-Uruguay and Argentine Line	300, 600	P	0.40	4.00	Sweden
Kronstad ¹	TTC	150	(Armateur) Grøstad Rederi A/S, Arendal	300, 450, 600, 800	P G	0.40	4.00	Norway
Kroonland ¹⁰⁰	KSH	200	International Mercantile Marine Co., American Line, 9, Broadway, New York (N.Y.)	300, 450, 600	P G	0.40	—	United States of America
Kroslund ¹	TQO	100-150	(Armateur) Svithunlinjen A/S, Stavanger	300, 600	P G	0.40	4.00	Norway
Kutchak ²	WNS	200	Alaska Packers Assn., Wells-Fargo Building, San Francisco (Cal.)	300, 400, 600	P G ¹²⁷	0.40	—	United States of America
Kujawiak	AXF	—	Navy	300, 450, 600, 800	O	—	—	Poland
Kukui ²	NLF	100	Bureau of Lighthouses Dept. of Commerce, Washington (D.C.)	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Kuma ¹	JLA	—	Navy	—	O	—	—	Japan
Kumano Maru ¹	JKF	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0.40	—	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Remarks.
							Per Word.	Minimum per Radiotelegram.	
Kumara ¹⁹	YWT	270	—	300, 600	P G	X	0.40	—	Great Britain
Kumeric ¹⁹	GJO	250	—	300, 600	P G	N	0.40	—	Great Britain
Kimajiri Maru ¹	JKU	400	Nihon Kaifu Ekisai Kai (Japan Seamen's Aid Society)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kura ¹⁰	XIJ	110	—	300, 600	P G	X	0.40	—	Great Britain
Kurama ¹	JGR	—	Navy	—	O	—	—	—	Japan
Kurdistan ¹⁹	GRJ	130	—	300, 600	P G	X	0.40	—	Great Britain
Kureha Maru ¹	JBH	400	Tatsumi Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kurnark ¹⁹	EKV	180	—	300, 600	P G	X	0.40	—	Great Britain
Kurrow ²¹	GDZS	250	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	0.20 ²¹	—	Great Britain
Kurt ³⁵	DKU	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Kurt Woermann DKT ³⁵	DKT	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Kurt Woermann ¹	UBF	300	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Kurumba ¹	CGQ	250	Teikoku Kaifu Kaisha	300, 600	O	X	—	—	Australian Commonwealth
Kurushima Maru ¹	JMU	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Kusuga ¹	JRJ	—	Navy	—	O	—	—	—	Japan
Kut ¹⁸	YLF	180	—	300, 450, 600	P G	X	0.40	—	Great Britain
Kut Sang ¹⁹	GFKW	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Kuwa ²⁷	WCEE	200	U.S. Shipping Board, Washington (D.C.)	300, 400, 600	P G	X	0.40	—	United States of America
Kwai Sang ¹⁰	GCSN	—	—	300, 600	P G	X	0.40	—	Great Britain
Kwarra ¹⁰	ZMT	180	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1600 2000 to 2200	0.40	—	Great Britain
Kyheids ¹⁰	OSYA	150-200	Association Maritime Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Kyle	VOR	150	—	300, 600, 800	P G	X	0.40	4.00	Newfoundland
L. L. 98	NYN	—	Navy	300, 600	P G	N	0.20 in 0.40 in 0.60 in	—	United States of America
L. L. 99	NYO	—	Navy	300, 600	P G	N	0.20 in 0.40 in 0.60 in	—	United States of America

L 4 ⁸⁸	..	..	NYQ	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 5 ⁸⁸	..	..	NYR	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 6 ⁸⁸	..	..	NYS	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 7 ⁸⁸	..	..	NYT	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 8 ⁸⁸	..	..	NYU	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 9 ⁸⁸	..	..	NYV	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 10 ⁸⁸	..	..	NYW	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 11 ⁸⁸	..	..	NYX	—	Navy	..	..	300, 600	P G	..	N	0.40 ¹¹¹ 0.40 ¹¹²	United States of America
L 12 ⁸⁸	..	..	KIZX	—	U.S. Shipping Board, Washington (D.C.)	..	..	300, 600	P G	..	X	0.40	United States of America
L 13 ⁸⁸	..	..	UQX	140	Esercizio Navigazione di Stato, Rome	..	..	300, 600	P G	..	X	0.40	Italy
L 14 ⁸⁸	..	..	IPL	140	Navy	..	..	300, 600	P G	..	X	0.40	Italy
L 15 ⁸⁸	..	..	FAIL	—	..	..	..	300, 600	P G	..	N	0.05	France
L 16 ⁸⁸	..	..	VRK	—	..	..	..	300, 600	P G	..	N	—	Mauritius
L 17 ⁸⁸	..	..	FYD	200	Joseph Fluret, Boulogne-sur-Mer	..	..	300, 600	P G	..	N	0.40	France
L 18 ⁸⁸	..	..	LQJ	100	Nicola's Mihanovich Company, Ltd., Buenos Aires	..	..	300, 600	P G	..	N	0.40	Argentine Republic
L 19 ⁸⁸	..	..	XWS	150	Halifax Dredging Co.	..	..	300, 600	P	..	X	—	Canada
L 20 ⁸⁸	..	..	GJV	135	U.S. Shipping Board, Washington (D.C.)	..	..	300, 600	P G	..	X	0.40	Great Britain
L 21 ⁸⁸	..	..	KOGC	300	U.S. Shipping Board, Washington (D.C.)	..	..	300, 600	P G	..	X	0.40	United States of America
L 22 ⁸⁸	..	..	KIXD	300	U.S. Shipping Board, Washington (D.C.)	..	..	300, 450, 600	P G	..	X	0.40	United States of America
L 23 ⁸⁸	..	..	BTR	140	..	..	..	300, 600	P G	..	X	0.40	Great Britain
L 24 ⁸⁸	..	..	GJCD	350	..	..	..	300, 450, 600	P G	..	N	0.40	Great Britain
L 25 ⁸⁸	..	..	USP	140	Tripovich, D., Trieste	..	..	300, 600	P G	..	X	0.40	Italy
L 26 ⁸⁸	..	..	FDB	100	Compagnie des Pêcheries Maritimes de l'Atlantique, La Rochelle	..	..	300, 600	P G	..	X	0.40	France
L 27 ⁸⁸	..	..	EYA	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
L 28 ⁸⁸	..	..	EZS	145	Navy	..	..	300, 600	P G	..	X	0.40	Great Britain
L 29 ⁸⁸	..	..	GFOZ	—	..	..	..	—	P G	..	—	—	Great Britain
L 30 ⁸⁸	..	..	GOS	90	Dover Harbour Board	..	..	150, 300	P	..	X	0.10 ⁸⁷	Great Britain
L 31 ⁸⁸	..	..	GFCM	—	..	..	..	300, 600	P G	..	X	0.10 ⁸⁷	Great Britain
L 32 ⁸⁸	..	..	YLC	200	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
L 33 ⁸⁸	..	..	BDN	150	..	..	..	300, 450, 600	P G	..	X	0.10 ⁸⁷	Great Britain
L 34 ⁸⁸	..	..	GDQJ	140	Eastern Telegraph Co., Ltd.	..	..	300, 450, 600	P	..	X	0.40	Great Britain
L 35 ⁸⁸	..	..	GCTQ	—	Dover Harbour Board	..	..	300, 600	P	..	X	—	Great Britain
L 36 ⁸⁸	..	..	VDL	100	Govt. Station (Dept. Marine and Fisheries, Ottawa, Ont.)	..	..	300, 600	O	..	X	—	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Lady Kathleen ¹⁹	YCR	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Lady Kerry ¹⁹	GFBR	—	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Lady Killiney ²⁰	GBLK	100	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Lady Kirk ¹⁹	YGU	130	—	300, 600	P G	X	0.40	—	Great Britain
Lady Laurier ²	VDF ⁴	100	Govt. Station (Department Marine and Fisheries, Ottawa, Ont.)	300, 600, 800	O	X	—	—	Canada
Lady Loch ¹	VHS	175	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Lady Rhondia ¹⁹	ZIA	105	—	300, 600	P G	—	0.40	—	Great Britain
Lady Sybil ²¹	VGDP	200	International Petroleum Co., Toronto (Ont.)	300, 600	P	—	0.40	—	Canada
Lady Wicklow ¹⁹	GFBS	—	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Lady Wimbome ¹⁹	XFU	140	—	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Laene	AZC	—	Operated by Alfred Holt and Company, India Buildings, Water Street, Liverpool	300, 600	O	—	—	—	Esthonia
Laertes ²¹	MYX	—	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	Great Britain
La Fayette ¹	FGE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	France
Laifomo ¹⁰³	KIXK	300	—	300, 450, 600	P G	X	0.40	—	United States of America
La Fontaine ¹	FWO	—	Delmas Freres, La Rochelle	—	P G	X	0.40	—	France
Lagarfoss ^{81.1}	TFL	200	Eimskipafelag Islands, Reykjavik	300, 450, 600, 800	P G	X	0.40	4.00	Iceland
Lages ¹⁵	PUI	100	Lage & Irmãos, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Lago (El)	KDNW	150	Southern Pacific Co.	300, 600	P G	X	0.40	—	United States of America
Lagos ⁸¹	KUE	100-150	—	300, 600	P G	X	0.40	4.00	Portugal
Lagrange	FALG	—	—	300, 800	P G	N	0.05	—	France
Laguna IMB ¹⁷	IMB	190	Navy Navigazione Libera Triestina, Trieste	300, 600	P G	X	0.40	—	Italy
Laguna SRI ¹⁵	SRI	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
La Hire	FBVH	—	Navy	300, 800	P G	X	0.05	—	France
Lahore ¹⁹	GDBZ	—	—	300, 600	P G	X	0.40	—	Great Britain
Lai Sang ¹⁹	GJMX	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Laita ¹	UME	180	Société Anonyme La Pêche Mari-	300, 450, 600	P G	X	0.40	—	France

Lake Akkra ¹⁰³	..	KVUE	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Allen ^{9 131}	..	KLEI	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Alvada ^{9 131}	..	KXAA	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Annette ⁹⁷	..	KKOE	150	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Arline ¹⁰³	..	KZOE	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Aurice ^{9 131}	..	KZIA	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Beacon ^{9 131}	..	WTAA	150	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Belnora ^{9 131}	..	KZII	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Benbow ¹⁰³	..	KVAE	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.10	United States of America
Lake Benton ¹⁰³	..	KSIU	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Berdan ¹⁰³	..	KZEE	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Blanchester ^{9 131}	..	KTIU	—	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Bledsoe ⁹⁷	..	KTUE	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lakebridge ¹⁰³	..	KDIS	100	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Buckeye ^{9 131}	..	WSEU	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Butler ^{9 131}	..	W N	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	N	0.40	United States of America
Lake Cahoon ¹⁰³	..	WKEE	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Calistago ⁹⁷	..	KXIU	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Callicoon ⁹⁷	..	WNAO	100	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Canaveral ⁹⁷	..	KIDS	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Candalaria ⁹⁷	..	KIJB	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Cannonsburg ⁹⁷	..	KIMV	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Capens ¹⁰³	..	KLUA	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.10	United States of America
Lake Cathoon ^{9 131}	..	WL50	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America
Lake Catherine ⁹⁷	..	KSH	150	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.10	United States of America
Lake Cayuga ^{9 131}	..	KLUI	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	United States of America
Lake Charles ⁹⁷	..	K4W	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Remarks.
							Per Word.	Minimum per Radio-telegram.	
Lake Charlotte ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Charlottessville ^{9 121}	WNEA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Chelan ⁹⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Clear ¹⁰³	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Como ⁹⁷	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Conesus ⁹⁷	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Copley ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Crescent ¹⁰³	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Crystal ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Dancy ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Daraga ⁹⁷	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Delancey ^{9 121}	..	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Desha ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Deval ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Duncan ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Dunmore ^{9 121}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Dymor ¹⁰³	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Eckhart ⁹⁷	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Eliko ⁹	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Elizabeth ⁹⁷	WOP	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

	KEPM	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	UNITED STATES OF AMERICA
Lake Elkwater ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elkwood ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Ellendale ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Ellenorah ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Ellerslie ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, (00)	P G	..	0.40	United States of America
Lake Ellicott ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elijiay ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Ellithorpe ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Ellsbury ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Ellsworth ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elmdale ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elmhurst	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elmont ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elmsford ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elmwood ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elon ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elpueblo ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elshah ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elshore ²	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Elsmere ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elva ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Elwin ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Ennis ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Fablus ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Fabyan ²	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America
Lake Fagundas ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Fairfax ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Lake Fairlie ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Lake Fairport ¹⁰⁸	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Falama ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fahn ¹⁰³	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Faubush ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fandango ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fandon ¹⁰³	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Faunin ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Fanquier ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fansdale ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farabee ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farber ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Faresman ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farge ¹⁰³	..	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Faribault ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Faristell ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Farley ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farin ^{9 131}	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farningdale ⁹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farragut ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Farrar ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

Lake Faulk 101	NEJV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Fawonia 103	KOJP	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Faxon 9 131	KOLJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fear 97	KIVM	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Felden 9 131	KOLK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Fenn 103	KOTT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Feodora 103	KUBT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fernalda 103	KOPB	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fernando 103	KELM	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Fernwood 103	KDEA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Ferrona 97	KELN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Festina 9 131	KEQP	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Festus 97	KERM	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fibre 103	KERN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fielding 103	KERP	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fife 103	KESM	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Figart 9 131	KESN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fighting 97	KESP	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Filbert	KONV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Fillon 97	KOPV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fiscus 9 131	KOCG	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fisher 103	KODD	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fitch 103	KOJQ	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Fithian 103	KOKZ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Flag 9 131	KUMX	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Flagon 103	KIXT	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Flagstaff 103	KIZM	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Flambeau 103	KIZN	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radio-telegram.	
Lake Flanders § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Platonla 102	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Flattery § 131	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Floravista § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Florian	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Floris § 131	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Flournoy § 131	..	200	Lone Star S.S. Company	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Flovilla § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Flume 97	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Flushing 97	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fluvanna 103	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Flynn 97	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Folcroft § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fonda 103	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fondulac § 131	..	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fontana 103	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fontanet § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Forkville 103	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Forney 103	200	Hjalmer Buvig	300, 600	P G ..	X	0.40	—	United States of America
Lake Forsby § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Fossil § 131	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

Lake Fouché ¹⁰²	..	WPIU	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Foxboro ^{9 121}	..	KESB	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Foxcraft ⁹⁷	..	KEGL	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Fraichur ¹⁰²	..	KEJG	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Fraley ¹⁰²	..	KEJJ	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frances ^{9 121}	..	KTAO	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Franconia ^{9 121}	..	WCUO	150	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Fray ⁹⁷	..	WCUU	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frazee ^{9 121}	..	WDUA	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Freeborn ⁹⁷	..	WDUI	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Freed ^{9 121}	..	WDUD	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Freeland ¹⁰²	..	WDUU	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Freezout ^{9 121}	..	WFUA	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Frenchton ^{9 121}	..	WFUE	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Fresco ^{9 121}	..	WNAU	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Friar ⁹⁷	..	KEFN	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frio ¹⁰²	..	KEFP	—	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frohna ⁹⁷	..	KEGR	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Frolozo ¹⁰²	..	KEGN	—	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frugality ^{9 121}	..	KEGP	300	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Frumet ^{9 121}	..	KIRJ	300	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Fugard ¹⁰²	..	WLEU	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Furlay ¹⁰²	..	WMAA	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Furlough ^{9 121}	..	KEKP	200	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Furnas ¹⁰²	..	KUTV	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Gadsden ^{9 121}	..	KITP	200	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Lake Gathier ¹⁰²	..	KOJZ	—	(D.C.) U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
Lake Gakona ⁹⁷ ..	KVOU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Galata ^{9 121} ..	KOJJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Galera ⁹⁷ ..	KXAI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Galewood ⁹⁷ ..	KOJX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Galien ⁹⁷ ..	KOJT	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Galisteo ⁹⁷ ..	KUGL	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Ganado ..	KUMB	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gano ^{9 121} ..	KDGR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gardner ^{9 121} ..	KXEO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Garza ¹⁰⁸ ..	KVOE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gaspar ^{9 121} ..	KVOI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gatun ⁹⁷ ..	KDKP	—	Saginaw Shipbuilding Company	300, 600	P G ..	X	—	—	United States of America
Lake Gazette ^{9 121} ..	KIPN	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gebhart ^{9 121} ..	KOGV	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Gedney ⁹⁷ ..	KVUO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Geneva ^{9 121} ..	KXUA	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake George ¹⁰⁸ ..	KDIZ	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gera ^{9 121} ..	KOKS	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gert ^{9 121} ..	KOMB	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Getaway ^{9 121} ..	KOLZ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America

Lake	Country	Year	Area (sq. miles)	Volume (cu. miles)	Depth (feet)	Temperature (°F)	Salinity (ppt)	pH	Hardness (dH)	Specific Gravity	Notes
Lake Geyser	United States of America	1911	—	300, 600	—	—	—	—	—	—	—
Lake Giddings	United States of America	1911	—	300, 450, 800	—	—	—	—	—	—	—
Lake Gilboa	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gilpen	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Giltia	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Giltedge	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Girardeau	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Girth	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gitano	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Glasco	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Glaucus	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Glebe	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Glencoe	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gorin	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gorman	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gorman	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Govan	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gradan	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Grainger	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Grama	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gramplan	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Grampus	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Granby	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Grandon	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Graphite	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gratis	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gratian	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gravella	United States of America	1911	300	300, 600	—	—	—	—	—	—	—
Lake Gravett	United States of America	1911	300	300, 600	—	—	—	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
Lake Gravity ^{9 131}	WBVA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Greenbrier ⁹⁷	WBUE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gretna ^{9 131}	WBUI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Grogan ^{9 131}	WBVO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Gunn ^{9 131}	KUNC	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Haresti ⁹⁷	KUGN	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Harminia	KUNB	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	—	0.40	—	United States of America
Lake Harney ^{9 131}	KGOE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Harris ¹⁰³	KXAU	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Hector ^{9 131}	KUMZ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Helen ¹⁰³	KZOI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Hemlock ^{9 131}	KLOE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Hewes ⁹⁷	KVUU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Hurst ⁹⁷	KLOI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Ikatan ⁹⁷	KUCM	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Inaba ^{9 131}	KEFM	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lake Indian ⁹⁷	KZOO	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Inglenook ¹⁰³	KOBT	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Janet ⁹⁷	KFD	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Lake Jessup ¹⁰³	KHV	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

Lake Kyttle ⁹⁷	..	WCOU	150	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	..	..	United States of America
Lakeland ^{9 131}	..	WDL	150	Tri-State S.S. Company ..	300, 600	P G	..	..	United States of America
Lake Larga ⁹⁷	..	KMUE	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	United States of America
Lake Lasang ^{9 131}	..	KMUA	200	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	..	..	United States of America
Lake Ledan ⁹⁷	..	KTUA	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Lemando ¹⁰³	..	WCIO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Lesa ⁹⁷	..	KXOU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Licoco ⁹⁷	..	WTAO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Lida ^{9 131}	..	KLOO	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	United States of America
Lake Lillicusum ⁹⁷	..	KZIO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Lillian ¹⁰³	..	KXUI	200	International Coal Transportation Corporation, 39, Broadway, New York (N.Y.)	300, 600	P G	..	..	United States of America
Lake Linden ^{9 131}	..	KZAE	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Louise ^{9 131}	..	KZUU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Marion ^{9 131}	..	KXEE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Markham ^{9 131}	..	KTOU	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Mary ^{9 131}	..	KREO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Mattato ¹⁰³	..	WTAI	100	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	..	..	United States of America
Lake Maurepas ^{9 131}	..	KLEA	200	U.S. Shipping Board, Washington (D.C.)	300, 800	P G	..	..	United States of America
Lake Medford ^{9 131}	..	KZOA	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	United States of America
Lake Miraflores ¹⁰³	..	KDNR	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Narka ^{9 131}	..	KTOA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Ogden ¹⁰³	..	KHU	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Onawa ¹⁰³	..	KOJM	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Ontario ^{9 131}	..	KDIR	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Orange ^{9 131}	..	KZOU	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Ormoc ¹⁰³	..	KVUA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	United States of America
Lake Osweya ¹⁰³	..	KVAA	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	..	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.	Country.
Lake Otisco # 131	KLIA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Otsuago #7	KXAO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Pachuta #7	KTUU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Pearl # 131	KVIO	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Pepin # 131	KTUI	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Pewaukee # 131	KLEU	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Pickaway #103	WKAO	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Pleasant #7	KXEA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Saba #103	KOS	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Sanford # 131	KXEI	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Sapor # 131	KEZB	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Savus #103	KOCB	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Sebago # 131	KLUE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Shewanuo #103	KLOU	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lakeshore # 131	KDIV	200	E. K. Wood Lumber Company (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Silver #103	KHE	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Singara #7	KITQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Slavi #7	KOTJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake St. Clair #7	WNL	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Lake Stirling # 131	KDJE	200	Richmond-New York S.S. Co. (D.C.)	300, 600	P G	X	0.40	United States of America
Lake Strabo #7	KEBR	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America

Lake St. Regis ⁹⁷	200	..	KLEE	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
Lake Strymon ^{9 121}	200	..	KONS	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Sunapee ^{9 121}	200	..	KLIU	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Superior ⁹⁷	100	..	KDIT	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Tappan ¹⁰³	—	..	KOVC	U.S. Shipping Board, Washington (D.C.)	300, 600	P ..	—	0.40	Canada
Laketon ²¹	150	..	CHO	Mathews S.S. Co., Toronto, Ont.	300, 600	P ..	—	0.20	United States of America
Lake Traverse ¹⁰³	—	..	KDJD	American-Hawaiian S.S. Co., 8, Bridge St., New York (N.Y.)	300, 600	P G ..	X	0.40	United States of America
Lake Treba ¹⁰³	200	..	KOSQ	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Tulare ¹⁰³	150	..	WDX	International Coal Transportation Corporation, 39, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	United States of America
Lakeview ^{9 121}	100	..	KDIX	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lakeville ¹⁰²	200	..	KXEU	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Washburn ⁹⁷	200	..	KREI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Weir ^{9 121}	200	..	KDIW	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Wilson ^{9 121}	100	..	KZAO	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Winito ¹⁰³	150	..	KSOI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Winona ^{9 121}	200	..	KLAU	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Winoski ⁹⁷	200	..	KZIE	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Winthrop ¹⁰³	200	..	KZAI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Wood ^{9 121}	100	..	KDJC	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Yahara ⁹⁷	150	..	KZAU	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Yalverton ^{9 121}	200	..	KVOO	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Yemassee ¹⁰³	150	..	KTOO	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Ypsilanti ¹⁰³	200	..	WKEI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lake Zaliski ¹⁰⁸	200	..	WKAI	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Lakonia ¹⁹	170	..	GPW	—	300, 600	P G ..	X	0.40	Great Britain
Lalande ¹⁹	—	..	GDON	—	300, 600	P G ..	X	0.40	Great Britain
Lama ¹⁹	140	..	GJN	—	300, 600	P G ..	X	0.40	Great Britain
Lamartine ¹	400	..	EME	—	300, 600	P G ..	X	0.40	France

Société des Services Contractuels
des Messageries Maritimes, 9, Rue
de Seze, Paris

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumber Radio-telegram.	
Lambaré ¹	LQK	135	Nicola's Mihanovich Ltd., Buenos Aires	300, 600	P G	N	0.40	4.00	Argentine Republic
Lamberton ⁹⁹	NAZL	—	.. .. .	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lambs (The) ¹⁰³	KEBZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Lamentin ¹	FQL	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Lamington ¹⁰	ETF	140	—	300, 600	P G	X	0.40	—	Great Britain
Lammeroo ¹	VZJ	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ²	—	Australian Commonwealth
Lamoriçiere ^{55 1}	FXK	300	Compagnie Générale Transatlantique, Paris	300, 450, 600	P G	X	0.10	—	France
Lamotte-Picquet	FAMP	—	.. .. .	300, 800	P G	N	0.05	—	France
Lampas ¹⁹	EYC	—	.. .. .	300, 450, 600	P G	N	0.40 ¹¹¹ 0.20 ¹¹²	—	Great Britain
Lampasas ¹⁰³	KEP	200	Malory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 450, 600	P G	N	0.40 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lampo ¹⁷	ILJ	190	La Columbia, Genoa	300, 600	P G	X	0.40	—	Italy
Lamson ⁹⁹	NUNC	300	.. .. .	300, 600	P G	X	—	—	United States of America
Lancashire ⁵⁹	VHS	300	.. .. .	300, 450, 600	P G	X	0.40	—	Great Britain
Lancaster ^{9 121}	KQUE	300	H. F. Alexander, Perkins Buildings, Tacoma (Wash.)	300, 600	P G	X	0.40	—	United States of America
Lancaster Castle ¹⁹	GCKR	—	.. .. .	300, 600	P G	X	0.40	—	Great Britain
Lancastrian Prince ¹⁹	GFWR	—	.. .. .	300, 450, 600	P G	X	0.40	—	Great Britain
Lanciere ^{..}	HZ	—	Navy	—	—	—	—	—	Italy
Landaas ¹	LCX	100-150	(Armateur) Johan Erland, Bergen	300, 600	P G	X	0.40	4.00	Norway
Langford ¹	AWL	300-600	(Armateurs) den Norske Amerikalinge, A/S Christiania	300, 450, 600, 800	P G	X	0.40	4.00	Norway
Langley ⁹⁹	NNC	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Langton Hall ¹⁹	ELS	145	.. .. .	300, 600	P G	X	0.40 ¹¹¹ 0.20 ¹¹²	—	Great Britain
Lansdale ⁹⁹	NERL	—	Navy	300, 600	P G	N	0.40 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lansdowne ^{9 121}	KONP	300	U.S. Shipping Board, Washington (D.C.)	—	P G	N	0.40	—	United States of America

Country	Line	Class	Year	Flag	Company	Port	Capacity	Speed	Range	Notes
France	Lansquen	FBLO	190	URP	Navy	Esercizio Navigazione di Stato, Rome	300, 800	—	—	United States of America
Italy	Lanuvium	URP	190	URP	Navy	Esercizio Navigazione di Stato, Rome	300, 800	—	—	United States of America
Spain	Lanzarote	TLV	200	TLV	Navy	Compagnia Vapores Interinsulares Canarios, Las Palmas	300, 800	—	—	United States of America
France	Laperouse	FBLP	—	FBLP	Navy	Compagnie Générale Transatlantique, Paris	300, 800	—	—	United States of America
France	La Pérouse	FTD	300	FTD	Navy	Compagnie Générale Transatlantique, Paris	300, 800	—	—	United States of America
France	Lapeyrouse	FWL	—	FWL	Navy	Compagnie Générale Armement Maritime, Paris	—	—	—	United States of America
France	Laplace	FALP	—	FALP	Navy	Compagnie Générale Armement Maritime, Paris	—	—	—	United States of America
Great Britain	Laplace	LUV	170	LUV	Navy	—	300, 800	—	—	United States of America
Great Britain	Laplant	LYE	200	LYE	Navy	—	300, 800	—	—	United States of America
Sweden	Laponia	SJB	250	SJB	Navy	Trafikaktiebolaget Grangeberg-Oxelösund, Stockholm	300, 800	—	—	United States of America
United States of America	La Purissima	KDVI	—	NALC	Navy	Union Oil Co.	300, 800	—	—	United States of America
United States of America	Lapwing	NALC	—	NALC	Navy	Union Oil Co.	300, 800	—	—	United States of America
United States of America	Laomedon	ZSZ	200	ZSZ	Navy	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	—	—	United States of America
United States of America	Laramie	NUGL	—	NUGL	Navy	—	300, 800	—	—	United States of America
United States of America	Lardner	NUPF	—	PZC	Navy	Stoomboot Maatschappij Hille-gersberg, Amsterdam	300, 800	—	—	United States of America
United States of America	Larenberg	PZC	—	PZC	Navy	Stoomboot Maatschappij Hille-gersberg, Amsterdam	300, 800	—	—	United States of America
United States of America	Largo	YVO	140	YVO	Navy	—	300, 800	—	—	United States of America
United States of America	Largo Law	ZOH	145	ZOH	Navy	—	300, 800	—	—	United States of America
United States of America	Largo Bay	VZBS	400	VZBS	Navy	—	300, 450, 600	—	—	United States of America
United States of America	Larisan	YAM	120	YAM	Navy	—	300, 800	—	—	United States of America
United States of America	Lark	NIJK	—	NIJK	Navy	—	300, 800	—	—	United States of America
United States of America	Larkspur	NAMB	—	NAMB	Navy	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 800	—	—	United States of America
United States of America	Larne	ZRA	200	ZRA	Navy	—	300, 800	—	—	United States of America
United States of America	Larsen	NITK	—	NITK	Navy	—	300, 800	—	—	United States of America
United States of America	La Salle	HST	250	HST	Navy	Transports Maritimes de l'Etat	300, 800	—	—	United States of America
United States of America	Lassell	GJBV	350	GJBV	Navy	—	300, 450, 600	—	—	United States of America
United States of America	Lassigny	FBLB	—	FBLB	Navy	—	300, 800	—	—	United States of America
United States of America	Latham	KUKR	300	KUKR	Navy	U.S. Shipping Board	300, 450, 600	—	—	United States of America
United States of America	Latorre	CAA	—	CAA	Navy	—	300, 800	—	—	United States of America
United States of America	Latouche	WAI	100	WAI	Navy	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 800	—	—	United States of America
United States of America	Latvia	OYO	350	OYO	Navy	Aktieselskabet det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	—	—	United States of America
United States of America	Laub	NICJ	—	NICJ	Navy	—	300, 800	—	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimumber Radio-telegram.	
Laugen ¹⁷	LEN	—	Navy	—	O	—	—	—	Norway
Laura ¹⁷	ITI	140	De Luca Vincenzo, Naples	300, 600	P G	—	0.40	—	Italy
Laura Skogland ¹	ASU	450	(Armateurs) T. H. Skogland & Son, A/S Haugehusund	300, 610	P G	X	0.40	4.00	Norway
Laurel NALV ²	NALV	—	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 600	P G	N	0.20	—	United States of America
Laurel WTUE ¹⁰⁹	WTUE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Laurel Branch ¹⁰	ZZG	135	Govt. Station (Dept. Marine and Fisheries, Ottawa, (Ont.)	300, 600	P G	X	0.40	—	Great Britain
Laurel Park ¹⁰	GFMZ	100	Société Algérienne de Navigation pour l'Afrique du Nord (Schiaffino et Cie, Algiers)	300, 600, 800	O	X	0.40	—	Great Britain
Laurent Schiaffino ¹	UIL	200	Navy	300, 600	P G	X	0.40	—	Canada
Lauria	EBS	220	Navy	—	O	—	—	—	France
Laurindo Pitta	SNL	50	Navy	300	O ³	—	0.40	—	Spain
Lautaro CAO	CAO	250	Navy	—	P G	—	—	—	Brazil
Lautaro CDM ¹	CDM	200	Borquez & Cia., Calle Blanco, 1061, Valparaiso	300, 600	P G	X	0.40	—	Chile
Lauterfels ²⁵	DDQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	4.00	Chile
Lavada ²⁷	KDFV	300	Compagnie des Pêcheries Maritimes de l'Atlantique, La Rochelle	300, 450, 600	P G	X	0.40	—	Germany
Lavardin ¹	FBG	150	Royal Indian Marine Ship	300, 600	P G	X	0.40	—	United States of America
Lawrence ¹⁰²	NUQQ	—	Navy	300, 600	P G	N	0.40	—	France
Lawrence VUV ²	VUV	200	Navy	300, 600	O ⁸	N	—	—	United States of America
Lava ⁹⁹	EBT	220	Navy	—	O	X	0.40 ³⁸	—	India
Lea ⁹⁹	NETF	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	Spain
Leafield ¹⁹	GXF	145	Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Leamington BBQ ¹⁰	BHQ	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Leamington GFAV ¹⁰	GFAV	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Leary ⁹⁹	NAFL	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Leca ⁴¹	CSH	100-150	(Armateurs) det Bergenske Dampskibsselskab,	300, 600	P G	N	0.40 ¹¹²	—	Portugal
Leda ¹	TRY	150-200	Bergen	300, 600	P G	N	0.40	4.00	Norway

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-tele-gram.	
Leonora CXJ ¹	..	150	Domingo Numbro, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Leonora PDK ¹	..	50-75	Stoomvaart Maatschappij Leonora, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Léopold, L. D. ¹	..	350	L. Dreyfus & Cie., Paris	300, 600	P G ..	X	0.40	—	France
Leopold II ¹⁰	..	100-150	Compagnie Royal Belge, Argentina, Antwerp	300, 600	P G ..	X	0.40	4.00	Belgium
Leopoldina FXC ¹	..	350	Compagnie Générale Transatlantique, Paris	300, 600	P G ..	N	0.40	—	France
Leopoldina SSV ¹⁴	..	250	Lage & Irmaos, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Leopolis ¹⁷	..	140	Lloyd Triestino Società di Navigazione a Vapore, Trieste	300, 600	P G ..	X	0.40	—	Italy
Lepanto IEX ¹⁷	..	140	Società Venezianzi di Navigazione a Vapore, Venice	300, 600	P G ..	X	0.40	—	Italy
Lepanto ZBA ¹⁹	..	210	(Armateur) H. M. Wrangell & Co., A/S Haugesund	300, 600	P G ..	X	0.40	—	Great Britain
Leseps ¹	..	150-175	—	300, 600	P G ..	X	0.40	4.00	Norway
Lesto ¹⁹	..	130	—	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Lestris ¹	..	250	Rederaktiebolaget S.S.A., Stockholm	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1600 to 1900	0.40	4.00	Sweden
Lestris GCXS ¹⁹	..	—	—	300, 450, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Leuton	—	Navy	—	—	—	—	—	Chile
Levant II ⁷¹	..	110	Eastern Telegraph Co., Ltd.	300, 450, 600	P ..	X	0.40	—	Great Britain
Levant Arrow ¹⁸³	..	—	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	—	—	United States of America
Levanzo ¹⁷	..	140	Marittima Italiana, Società di Navigazione per Servizi Postali, Genoa	300, 600	P G ..	X	0.40	—	Italy
Levenpool ¹⁹	..	140	Navy	300, 600	P G ..	X	—	—	Great Britain
Le Verrier	..	—	—	300, 800	P G ..	N	0.40	—	France
Levathan ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Levi, G. Burgess ²	..	200	Alaska-Portland Packers' Assn., 1107, Yeon Building, Portland	300, 450, 600	P G ..	N	0.20	—	United States of America

Levis ⁸⁸	200	KDL	United Fruit S.S. Corp'n.	300, 600	P	X	0.40	Great Britain
Levin ¹⁹	150	YCU	—	300, 600	P	0930 to 1030	0.20 ⁸	Australian Commonwealth
Levuka ¹	250	VHB	—	300, 600	P	1200 to 1300	0.40 ⁸	—
Lewis K. Thurlow ²	200	KXY	Crowell and Thurlow S.S. Co., 131, State St., Boston (Mass.)	300, 450, 600	P	1400 to 1430	—	United States of America
Lewis Luckenbach ⁹⁷	300	WFOE	Luckenbach Steamship Company	300, 450, 600	P	1630 to 1730	0.40	United States of America
Lexington KNB ^{9 121}	75	KNB	Colonial Navigation Co., Pier 39, North River, New York (N.Y.)	300, 550, 600	P	2030 to 0030 (ship's time)	0.40 ¹¹	United States of America
Lexington NEDB ⁹⁸	—	NEDB	Navy	300, 600	P	0600 to 0800	0.40	United States of America
Lexington ZAY ¹⁸	190	ZAY	—	300, 600	P	0900 to 1200	0.40	Great Britain
Lhasa ¹⁹	170	GBCS	Fraissinet & Cie (Compagnie Mar- seillaise de Navigation à Vapeur, Marseille)	300, 600	P	1400 to 1800	0.40	France
Lianone ^{97 1}	200	FRA	Libby McNeil & Libby, 417, Market St., San Francisco (Cal.)	300, 450, 535, 600	P	2000 to 2200	0.10	United States of America
Libby Maine ⁹⁷	200	KDV	Lybeck Ocean Harvester Company	300, 600	P	X	0.40	United States of America
Liberator KDTA	—	KDTA	U.S. Shipping Board, Washington (D.C.)	300, 600	P	—	—	United States of America
Liberator KRIU ⁹⁷	300	KRIU	Corrado Andrea, Genoa	300, 600	P	X	0.40	Italy
Liberta ¹⁷	140	UUL	Navy	450, 600	O	X	—	Argentine Republic
Libertad ¹	—	LKJ	Société la Pêche Française, Fécamp	300, 600	P	X	0.40	France
Liberte ²	150	UKV	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	X	0.40	United States of America
Liberty Glo ¹⁰³	300	KIQZ	U.S. and Australia Line (D.C.)	300, 600	P	X	0.20	United States of America
Liberty WCOO ⁹⁷	300	WCOO	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	X	0.40	United States of America
Liberty ZCE ¹⁹	—	ZCE	—	300, 600	P	—	—	United States of America
Liberty Bell ^{9 121}	300	KUJX	U.S. Shipping Board, Washington (D.C.)	300, 600	P	X	0.40	United States of America
Liberty Land ^{9 121}	300	KISS	U.S. Shipping Board, Washington (D.C.)	300, 600	P	X	0.40	United States of America
Liberty Minquas ⁹⁷	200	KUBJ	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	X	0.40	United States of America
Libia	—	IKH	Navy	—	P	—	—	Italy
Libourne ¹	200	UML	Société Maritime de Transports, 1, Quai Jean Bart, Nantes	300, 600	P	X	0.40	France
Liebenfels ²⁵	200	DLS	General Petroleum Corporation, 310, Sansone St., San Francisco (Cal.)	300, 600	P	X	0.40	Germany
Liebre ²	300	KDPG	Compagnie Nationale Belge de Transports Maritimes, Antwerp	300, 600	P	X	0.40	United States of America
Liège	100-150	OTL	Navy	300, 600	P	N	0.40	Belgium
Lien-Chin	—	XRC	Compagnie des Messageries Mari- times, Paris	300, 600	O	X	—	France
Lieutenant de la Tour ¹	300	FMJ	Transports Maritimes de l'Etat	300, 600	P	X	0.40	France
Lieutenant Delorme ¹	200	HRL	Compagnie des Messageries Mari- times, Paris	300, 600	P	X	0.40	France
Lieutenant de Mussy ¹	450	FYI	—	300, 600	P	X	0.40	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimump Radio-tele-gram.	
Lieutenant Fournaud ¹ ..	UAA	200	Compagnie de Navigation mixte, 54, Rue Carnabiere, Marseilles	300, 600	P G ..	X	0.40	—	France
Lieutenant Geo. M. Harris ²	WYAR	30	U.S. Signal Corps, War Dept., Washington (D.C.)	400	O ..	X	—	—	United States of America
Lieutenant Harold G. Douglas ¹⁰²	WYBQ	—	—	300, 600	P G ..	N	—	—	United States of America
Lieutenant Pegoud ¹ ..	HRV	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Lieutenant Robert Mory ¹	FLH	200	Mory & Cie., Rue Charles Butor, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Lieutenant St. Loubert-Big ¹	UFC.	350	Compagnie des Messageries Maritimes, 9, Rue de Séze, Paris	300, 450, 600	P G ..	X	0.40	—	France
Liévin ..	FALI	—	Navy ..	300, 800	P G ..	N	0.05	—	France
Lifley ..	GKAB	—	Navy ..	—	P G ..	—	—	—	Great Britain
Liffield ¹ ..	ASX	300	(Armateur), Harald Grieg Maritens, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Lilfand ⁴⁰	OHI	200	Aktieselskabet del Dansk-Franske Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Liger ¹ ..	FSL	300	Compagnie de Navigation Sud-Atlantique, Paris	300, 600	P G ..	— ²⁷	0.40	—	France
Lighburne ¹⁰³	KIVF	300	Texas Company, Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Lightfoot ⁶⁰	GBFC	100	British India Steam Navigation Co., Ltd.	300, 450, 600	P G ..	X	0.15 ⁸⁷	—	Great Britain
Lightning ¹⁵	VUL	200	Gulf Refining Co., West 7th St., Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	India
Ligonier ¹⁰⁰	KTD	200	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P G ..	X	0.40	—	United States of America
Liguria ¹ ..	SIB	250	—	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Lilac ² ..	NUCF	—	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lillian ¹⁰⁹ ..	KUGZ	300	A. H. Bull S.S. Company, 17, Battery Place, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Lillois ¹ ..	FHP	200	Fourny & Cie., Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Lilnae ⁹⁷ ..	KDHU	300	U.S. Mexican Oil Corp., 26, Beaver	300, 450, 600	P G ..	X	—	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Liscum ²	WXE	300	U.S. Signal Corps, War Dept., Washington (D.C.)	600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lisgar County ¹	TRM	300	(Armateur) Olaf Orvig, Bergen	300, 600	P G	X	0.40	4.00	Norway
Liss ¹	AVQ	200-250	(Armateurs) A/S Krezimasko, Christiania	300, 600	P G	X	0.40	4.00	Norway
Litchfield ⁹⁹	NUMM	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lithopolis ¹⁰³	WQEA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Litopa ¹⁰	EZK	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Litke ¹⁰	RBG	300	Navy	300, 600, 900	O	X	0.40	—	Russia
Little ⁹⁹	NRT	—	—	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lituania ⁴⁰	OIK	300	Aktieselskabet det Ostasiatiskt Kompagni, Copenhagen	300, 450, 600, 800	P G	N	0.40	4.00	Denmark
Liv ¹	AQD	400	(Armateur) Nils A. Orum, Christiania	300, 450, 600	P G	X	0.40	4.00	Norway
Livanos ¹	SWL	150-200	G. Livanos, Chios	300, 600	P G	X	0.40	4.00	Greece
Liverpool Maru ¹	JPL	500	Kokusai Kisen Kaisha	300, 600	P G	—	0.40	—	Japan
Livingstone ¹²¹	KDOY	150	Tri-State S.S. Co.	300, 450, 600	P G	X	0.10 ¹¹⁸	—	United States of America
Livingstone Roe ¹²¹	KDOD	300	Standard Oil Co. of N. J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Livingstonia ¹⁰	YLN	150	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	4.00	Great Britain
Livoner ¹⁰	OSV	150-200	—	300, 600	P G	X	0.40	—	Belgium
Livorno ¹⁰	ODO	125	—	300, 600	P G	X	0.40	—	Great Britain
Lizard ¹⁰	GFLY	300	Standard Oil Co. of N. J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.10 ⁸²	1.00 ⁸²	Great Britain
L. J. Drake ¹²¹	WZAA	300	—	300, 450, 600	P G	X	0.40	—	United States of America
Llanberis ¹⁰	ZSJ	150	—	300, 600	P G	X	0.40	—	Great Britain
Llangollen ¹⁰	VXE	150	—	300, 600	P G	X	0.40	—	Great Britain
Llangorse ¹⁰	EXF	150	—	300, 600	P G	X	0.40	—	Great Britain
Llanstephan Castle ¹⁰	MJT	230	—	300, 600	P G	N	0.40	—	Great Britain
Llanthony Abbey ¹⁰	ENP	150	—	300, 600	P G	X	0.40	—	Great Britain
Lobos ²⁰	GDXL	300	—	300, 450, 600	P G	X	0.40	—	Great Britain
Lochiel ¹⁰	GFLR	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Loch Katrina ²⁰	GDM	350	—	300, 450, 600	P G	X	0.40	—	Great Britain
Lookport ¹⁰³	KIXM	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	1.00 ⁸²	Great Britain

Loch Tay ² Lodovica ¹⁷	TPV URH	250 140	(Armateur) All. auisien, 1.050, 1.050, 1.050 Cosulich, Società Trieste di Navigazione, Trieste	300, 600 300, 600	P G	..	X	0.40	—	Italy
Loer ³⁵ Logan GJKP ¹⁹ Logan ²	DLR GJKP WKF	200 300 300	U.S. Signal Corps. War Dept., Washington (D.C.)	300, 450, 600 600	P G P G P G	..	X X N	0.40 0.40 0.20	4.00 — —	Germany Great Britain United States of America
Logician ¹⁹ Loiret	ENW FAQL	170	Navy	300, 600 300, 800	P G P G	..	X N	0.40 0.05	— —	Great Britain France
Loki ¹ Lolin ¹	UKT TLL	200 150	Laurens, Cherbourg Campaña Naviera Berencua, Bilbao	300, 600 300, 600	P G P G	..	X N	0.40 0.03	3.00	France Spain
Lolomi ¹⁹ Lolworth ¹⁹ Lom ¹ Lombardia ¹	KDWC GDMK LAP SIX	— — — 250	Rodman Wanmaker Navy Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600 300, 600 300, 600	P G O P	..	X	0.10 ⁸⁷ — 0.40	1.00 ⁸⁷ — 4.00	United States of America Great Britain Norway Sweden
Lombardy ¹⁰ Lombok ¹	GDZQ PGN	100 250	Stoomvaart Maatschappij Neder- land, Amsterdam	300, 600 300, 450, 600, 800	P G P G	..	X X	0.40 0.40	— 4.00	Great Britain Holland
Lompoc ¹⁹ Louchi	ENH SYC	170	Navy	300, 600	P G O	..	X	0.40	—	Great Britain Greece
Londonderry ¹¹ Londou ¹⁰ Londou ¹⁰ London Maru ¹	GPR ONO JCLA	150 150-200 400	Midland Railway Co., Lloyd Royal Belge, Antwerp	300, 400, 600 300, 600 300, 600	P R P G P G	..	N N N	0.10 ⁸⁷ 0.40 0.40	1.00 ⁸⁷ 4.00 —	Great Britain Belgium Japan
Londres ¹ Long ¹⁹	LQL NEPD	135 —	Nicola's, Mihanovich Ltd., Buenos Aires	300, 600 300, 600	P G P G	..	N N	0.40 0.20 ¹¹¹ 0.40 ¹¹²	4.00 — —	Argentine Republic United States of America
Long Beach ¹⁰⁸ Longhurst ¹⁰	NEFZ GDYN	100	—	300, 600 300, 600	P G P G	..	X X	0.10 ⁸⁷ —	1.00 ⁸⁷ —	United States of America Great Britain
Longnewton ¹⁹ Longships ¹⁹ Loongana ¹	ZPW GFLZ VJH	105 200	—	300, 600 300, 450, 600 300, 600	P G P G P G	..	X X X	0.10 ⁸⁷ 0.10 ⁸⁷ 0.20 ⁸ 0.40 ⁵	1.00 ⁸⁷ 1.00 ⁸⁷ — —	Great Britain Great Britain Australian Commonwealth
Loos ¹⁹ Loppersum ¹ Lorain ^{9 321} Lord ¹	OFV HEI KIFZ SMD	140 150 300 150	Stoomvaart Maatschappij Oostzee, Amsterdam U.S. Shipping Board, Washington (D.C.) Rederiaktiebolaget Alla, Helsing- borg	300, 600 300, 600 300, 450, 600 300, 600	P G P G P G P	..	X X X	0.40 0.40 0.40	— 4.00 — 4.00	Great Britain Holland United States of America Sweden
Lord Antrim ¹⁹ Lord Byron ¹⁹	ZDM ZVL	150 150	—	300, 600 300, 600	P G P G	..	X X	0.40 0.40	— —	Great Britain Great Britain

Shipboard Stations—Continued.

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiogram.	
Lord Clive	GKIW	—	Navy	—	P G	—	—	—	Great Britain
Lord Downshire ¹⁹	YDY	145	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	X ²⁷	0.40	—	Great Britain
Lord Dufferin ²¹	CJQ	150	—	300, 600, 800	P	—	0.40	—	Canada
Lord Eskine ¹⁹	GBXN	—	—	300, 600	P G	X	0.40	—	Great Britain
Lord Harrington ¹⁹	GBSK	—	—	300, 600	P G	X	0.40	—	Great Britain
Lord Kelvin ²¹	YRC	250	Anglo-American Telegraph Co., Ltd.	300, 600	P	X	0.40	—	Great Britain
Lord Londonderry ¹⁹	GCWY	180	—	300, 600	P G	X	0.40	—	Great Britain
Lord Ormonde ¹⁹	VGLR	300	American Metal Transport Co., 61, Broadway, New York (N.Y.)	300, 600, 800	P	X ²⁷	0.40	—	Canada
Lord Rhonda ¹⁹	YFV	110	—	300, 600	P G	X	0.40	—	Great Britain
Lord Sefton ¹⁹	ZVB	150	—	300, 600	P G	X	0.40	—	Great Britain
Lordship Manor ¹⁹	KIXN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Lord Stratheona VFX ²¹	VFX	100	Quebec Salvage & Wrecking Co., Montreal (P.Q.)	300, 450, 600	P G	— ²⁷	0.40	—	Canada
Lord Stratheona VGJK ²¹	VGJK	200	Thos. Harling, Montreal (P.Q.)	300, 600, 800	P	— ²⁷	0.40	—	Canada
Loredano ¹⁷	IUX	140	Società Veneziana di Navigazione a Vapore, Venice (Armateur) Lorentz W. Hansen, Bergen	300, 600	P G	X	0.40	—	Italy
Lorentz W. Hansen ¹	TPT	150-175	—	300, 600	P G	X	0.40	—	Norway
Lorenzo ¹⁹	GRDY	—	—	300, 600	P G	X	0.40	4.00	Great Britain
Lorston ¹	GVBL	—	—	300, 600	P G	—	—	—	Hong Kong
Loretta ¹⁹	KUXF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Lorient ¹	UMI	180	Société Maritime Auxiliaire de Transports, 1, Quai Jean Bart, Nantes	300, 450, 600	P G	—	—	—	France
Lorina ¹⁹	XMB	200	—	300, 600	P G	0800 to 1000	—	—	Great Britain
Lorie ² 29	CJC	100	Grand Trunk Pacific Coast S.S. Co.	300, 600	P G	1200 to 1400	—	—	Canada
Lorraine Cross ⁹ 131	KDDE	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	1600 to 1800	0.10 ⁸²	1.00 ⁸²	United States of America
Lorraine FALN	FALN	—	Navy	300, 800	P G	2000 to 2200	0.20	—	France
Lorraine FTL (La) ¹	FTL	300	Compagnie Générale Transatlantique	300, 800	P G	X ²⁷	0.40	—	France

Station	Code	Lat	Long	Ship	Company	Passes	Q ²³	Notes	Origin
Lassen ¹	OUL	..	..	Navy	..	600	..	..	Denmark
Lothar Bohlen ¹⁹	GFMT	..	..	Navy	..	300, 600	P G	..	Great Britain
Lothringen ¹	ALO	..	..	Navy	..	300, 600	O	..	Germany
Lotus ¹	FML	300	..	Société des Services Contractuels, Des Messageries Maritimes, Paris	..	300, 600	P G	..	France
Loughborough ¹⁹	BMR	..	..	E. D. Burge	..	300, 600	P G	..	Great Britain
Louise ²	KUKN	75	..	Holmens Bruks och Fabriks Aktiebolag, Nörköpings	..	300, 600	P G	..	United States of America
Louis de Geer ¹	SLX	250	..	..	..	300, 600	P	..	Sweden
Louise Marguerite ¹	UJN	150	..	Delpierre, Duval & Cie. (Armateurs), Boulogne-sur-Mer	..	300, 600	P G	..	France
Louise-Suzanne ¹	UJD	180	..	Frédéric Delpierre & Cie., Boulogne-sur-Mer	..	300, 600	P G	..	France
Louis Fraissinet ¹	FRR	200	..	Fraissinet & Cie. (Compagnie à Vapeur, Marseilles)	..	300, 600	P G	..	France
Louisiana KUL ¹⁰³	KUL	300	..	Texas Company, Port Arthur (Texas)	..	300, 450, 600	P G	..	United States of America
Louisiana NJB ⁹⁹	NJB	..	..	Navy	..	300, 600	P G	..	United States of America
Louisiana TPF ¹	TPF	150-200	..	(Armateur) Wilh. Wilhelmsen, Christiania	..	300, 600	P G	..	Norway
Louis L. D. ¹	FYG	300	..	L. Dreyfus & Cie., 4, Rue de la Banque, Paris	..	300, 600	P G	..	France
Louis R. Davidson	KDUH	150	..	American S.S. Company	..	300, 600	P G	..	United States of America
Louisville Bridge ¹⁹	KIDP	300	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	..	United States of America
Loup	FBOL	..	..	Navy	..	300, 800	P G	..	France
Loup-Cervier	FBVL	..	..	Navy	..	300, 800	P G	..	France
Louqsor ¹	FNL	300	..	Société des Services Contractuels des Messageries Maritimes, Paris	..	300, 600	P G	..	France
Lourenco Marques ⁶¹	CUF	100-150	..	Government	..	300, 600	P G	..	Portugal
Lévenom ¹	OUN	100	..	..	..	300, 600	P G	..	Denmark
Löwland ¹	TTX	300	..	(Armateur) Thorvald Pederson, Christiania	..	300, 600	P G	..	Norway
Loustakken ¹	ARM	150	..	(Armateur) Andreas Olsen, Bergen	..	300, 450, 600	P G	..	Norway
Lowestoft	GEIS	..	..	Navy	..	300, 600	P G	..	Great Britain
Lowlands ¹⁹	BFI	145	..	..	..	300, 600	P G	..	Great Britain
Lowland ¹⁹	YIK	145	..	..	..	300, 600	P G	..	Great Britain
Lowther Castle ¹⁹	ZRX	140	..	..	..	300, 600	P G	..	Great Britain
Loyal Citizen ¹⁹	YCK	..	..	Scindia Steam Navigation Co., Ltd.	..	300, 600	P G	..	Great Britain
Loyal Devonian ¹⁹	YXM	..	..	..	..	300, 600	P G	..	Great Britain
Loyalty ¹⁹	VWBL	250	..	..	..	300, 450, 600	P G	..	India
L. P. Holmblad ⁴⁰	OGAA	200	..	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	..	300, 450, 600	P G	..	Denmark
L. Roscoe ²	NZX	150	..	Alaskan Engineering Commission, Seattle (Wash.)	..	300, 600	O	..	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimump Radio-tele-gram.	
Lt.-Col. Herman C. Schumm ¹⁰²	WYBS	—	—	300, 600	P G ..	N	—	—	United States of America
Lt.-Col. Robert C. Gildart ¹⁰²	WYBR	—	—	300, 600	P G ..	N	—	—	United States of America
Lubabo ⁸⁷	CRBB	200	—	300, 600	—	—	—	—	Mozambique
Lubrico	KDUC	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,380	P G ..	X	0.40	—	United States of America
Lucania ¹⁷	IP1	190	La Lucania Società di Navigazione, Naples	300, 600	P G ..	X	0.40	—	Italy
Lucé ⁹⁹	NEGD	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Lucellum ¹⁹	ZWP	—	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2400	0.40	—	Great Britain
Lucerie ¹⁹	YHH	155	—	300, 600	P G ..	X	0.40	—	Great Britain
Lucerna ¹⁹	MUI	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Luciana ¹⁹	OCB	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Lucia ¹⁹	GEYB	—	—	—	P G ..	—	—	—	Great Britain
Lucient ¹⁹	OFS	100	Navy	300, 600	P G ..	X	0.10 ⁸⁷ 0.40	1.00 ⁸⁷	Great Britain
Lucigen ¹⁹	EMJ	160	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Luciline ¹⁹	EYP	160	—	300, 600	P G ..	—	—	—	Great Britain
Lucknow ²¹	XVD	100	Midland Transportation Company, Midland (Ont.)	300, 600	P ..	X ²⁷	0.40	—	Canada
Ludendorff ⁸⁵	DLD	200	Navy	300, 600	P G ..	—	—	—	Germany
Ludlow ¹⁹	NENZ	—	—	300, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ludwig Weiner	VNA	100	Government Tug (South African Railways and Harbours)	300, 600	O ..	—	—	—	South Africa (Union of)
Luella ¹⁰⁴	KLAA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Luigi Rizzo ¹⁷	ILU	200	Co-operativa Garibaldi Società Anonima Co-operativa fra Lavoratori del Mare, Genoa	300, 600	P G ..	X	0.40	—	Italy
Luis Casanova ¹	TJQ	150	Viuda e Hijos de Luis Casanova, Valencia	300, 600	P G ..	N	0.30	3.00	Spain
Luis Urquiuo ¹	CXI	100	—	300, 600	P G ..	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Lyman Stewart ^{1a1}	WTL	150	Union Oil Co of California, Oleum, (Cal.) Navy	300, 600, 1,800	P G	X	0.40 ¹²²	—	United States of America
Lynch	CBA	—	C. H. K. Curtis	—	—	—	—	—	Chile
Lyndonia ²	KULZ	100	—	300, 600	P G	X	—	—	United States of America
Lynntown ¹⁰	OCU	—	—	300, 600	P G	X	0.40	—	Great Britain
Lynnton Grange ¹⁸	ZEN	130	—	300, 600	P G	X	0.40	—	Great Britain
Lynx	PBX	—	Navy	600	O ³⁰	—	—	—	Holland
Lyons Maru ¹	JOM	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00	Japan
Lys ¹⁹	GDQL	—	—	300, 600	P G	X	0.15 ⁹²	1.50 ⁸²	Great Britain
M 1 ⁸⁹	NYV	—	Navy	300, 600	P G	—	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
M 28 ¹	ACT	—	Navy	—	O	—	—	—	Germany
M 46 ¹	ACR	—	Navy	—	O	—	—	—	Germany
M 50 ¹	ACT	—	Navy	—	O	—	—	—	Germany
M 57 ¹	ACY	—	Navy	—	O	—	—	—	Germany
M 60 ¹	AIB	—	Navy	—	O	—	—	—	Germany
M 61 ¹	AIC	—	Navy	—	O	—	—	—	Germany
M 66 ¹	AIE	—	Navy	—	O	—	—	—	Germany
M 72 ¹	AII	—	Navy	—	O	—	—	—	Germany
M 73 ¹	AIR	—	Navy	—	O	—	—	—	Germany
M 81 ¹	AIS	—	Navy	—	O	—	—	—	Germany
M 82 ¹	AIS	—	Navy	—	O	—	—	—	Germany
M 84 ¹	AIT	—	Navy	—	O	—	—	—	Germany
M 85 ¹	AIU	—	Navy	—	O	—	—	—	Germany
M 80 ¹	AIV	—	Navy	—	O	—	—	—	Germany
M 81 ¹	AJE	—	Navy	—	O	—	—	—	Germany
M 102 ¹	AJL	—	Navy	—	O	—	—	—	Germany
M 104 ¹	AJK	—	Navy	—	O	—	—	—	Germany
M 107 ¹	AJN	—	Navy	—	O	—	—	—	Germany
M 108 ¹	AJO	—	Navy	—	O	—	—	—	Germany
M 109 ¹	AJP	—	Navy	—	O	—	—	—	Germany
M 110 ¹	AJQ	—	Navy	—	O	—	—	—	Germany
M 111 ¹	AJR	—	Navy	—	O	—	—	—	Germany
M 112 ¹	AJS	—	Navy	—	O	—	—	—	Germany
M 113 ¹	AJT	—	Navy	—	O	—	—	—	Germany
M 114 ¹	AJU	—	Navy	—	O	—	—	—	Germany

Shipboard Stations

	M	AJW	Navy	—	O	X	Z	Germany
M 117 ¹	..	..	..	..	..	..	..	Germany
M 122 ¹	..	AKC	..	..	..	..	..	Germany
M 126 ¹	..	AKE	..	..	..	..	..	Germany
M 129 ¹	..	AKF	..	..	..	..	..	Germany
M 130 ¹	..	AKG	..	..	..	..	..	Germany
M 132 ¹	..	AKH	..	..	..	..	..	Germany
M 133 ¹	..	AKI	..	..	..	..	..	Germany
M 134 ¹	..	AKK	..	..	..	..	..	Germany
M 135 ¹	..	AKL	..	..	..	..	..	Germany
M 136 ¹	..	AKM	..	..	..	..	..	Germany
M 138 ¹	..	AKO	..	..	..	..	..	Germany
M 143 ¹	..	AKP	..	..	..	..	..	Germany
M 146 ¹	..	AKR	..	..	..	..	..	Germany
M 157 ¹	..	AKT	..	..	..	..	..	Germany
Maarten Harpeitz Tromp	PAB	..	..	..	O ³⁹	..	..	Holland
Maartensdijk ¹	PDQ	..	Nederlandsche - Amerikaansche Stoomvaart Maatschappij Holland-America Lijn, Rotterdam	300, 450, 800	PG	..	X	Holland
Maas ¹	TZS	..	Naamloze Vennootschap Hout-vaart, Rotterdam	300, 600	PG	..	X	Holland
Maasburg ..	OMN	..	Scheepvaart-en Transport Maatschappij Atlantica, Rotterdam	300, 450, 600, 800	PG	..	X	Holland
Maasdun ¹	TVL	..	Nederlandsche Amerikaansche Stoomvaart Maatschappij, Holland America Lijn, Rotterdam	300, 450, 600, 800	PG	..	N	Holland
Maasdijsk TZG ¹ ..	TZG	..	Solleveld, Van der Meer en E. H. van Hatum's Stoomvaart Maatschappij, Rotterdam	300, 600	PG	..	X	Holland
Maasdijsk TVC ¹ ..	TVC	..	Nederlandsche - Amerikaansche Stoomvaart Maatschappij Holland America Lijn, Rotterdam	300, 450, 600, 800	PG	..	X	Holland
Maashaven ¹	PXO	..	Maatschappij Stoomschip Maas-haven, Rotterdam	300, 600	PG	..	X	Holland
Maasland ¹	PYM	..	Koninklijke Hollandsche Lloyd, Amsterdam	300, 600	PG	..	X	Holland
M. A. Bradley ^{a 121}	WQH	..	Harvey H Brown & Co., Cleveland, Ohio	300, 600	PG	..	X	United States of America
Mabritton ¹⁹	GDBM	..	Tropical Radio Telegraph Co., 13, State St. Boston (Mass.)	300, 600	PG	..	X	Great Britain
Macabi ¹¹ ..	GFYT	..	Lage & Irmaes, Rio de Janeiro	300, 600	PG	..	X	Great Britain
Macapá ¹⁵	PUJ	..	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	PG	..	N	Brazil
Macassa ²¹ ..	VEK	..	Nango Yusen Kaisha	300, 600	PG	..	— ²⁷	Canada
Macassar Maru ¹	JNV	..	..	300, 600	PG	..	0800 to 1100 1400 to 1700 2000 to 2400	Japan
Macau	CTW	100-150	Navy	300, 600	O	..	..	Portugal
MacDonough ¹⁰²	NUOR	..	..	300, 600	PG	..	N	United States of America
Macedon ¹	CGX	240	..	300, 600	PG	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	Australian Commonwealth

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Macedonia ¹³	MML	230	—	300, 600, 2,100, 2,200	PG ..	X	0.40	—	Great Britain
Macedonier ¹⁰	OPW	130-200	Lloyd Royal Belge, Antwerp	300, 600	PG ..	X	0.40	—	Belgium
Machaon ⁷¹	GDPS	—	Operated by A. Holt & Co., Managers, Liverpool	300, 600	PG ..	X	0.40	—	Great Britain
Macharda ¹⁰	XIQ	155	—	300, 600	PG ..	X	0.40	—	Great Britain
Machenzie ¹⁰	NEVX	—	Navy	300, 600	PG ..	N	0.40 ¹¹¹	—	United States of America
Machias ¹⁰	NQL	—	Navy	300, 600	PG ..	N	0.40 ¹¹²	—	United States of America
Machinac ¹⁰	NUGD	—	Navy	300, 600	PG ..	N	0.40 ¹¹²	—	United States of America
Mackarra ¹	VXX	240	—	300, 600	PG ..	N	0.40 ¹¹²	—	United States of America
Mackay ..	GEKQ	—	Navy	—	PG ..	0930 to 1030	0.20 ⁸	—	Australian Commonwealth
Mackay-Bennett ⁷¹	MMB	400	Commercial Cable Co., Ltd.	300, 450, 600	P ..	1200 to 1300	0.40 ⁸	—	
Mackinaw ¹⁰	YOL	200	—	300, 600	P ..	1400 to 1430	—	—	
Mackworth ¹⁰	BKO	—	—	300, 600	P ..	1630 to 1730	—	—	
MacLeish ¹⁰²	NUPT	—	—	300, 600	P ..	2030 to 0030 (ship's time)	—	—	
Macoris ¹	UDI	400	Compagnie Générale Transatlantique, Paris	300, 600	P ..	X	0.40	—	Great Britain
Macumba ¹	VXY	240	—	300, 600	P ..	X	0.40	—	Great Britain
Maddalena O ¹⁷	UUC	140	Odero N. fu Alessandro & Co., Genoa	300, 600	P ..	0800 to 1000	—	—	Great Britain
Madame Enterprise ¹⁰	XFB	—	—	300, 600	P ..	1200 to 1400	0.20 ⁸	—	United States of America
Madame Midas ¹⁰	GDSX	—	—	300, 600	P ..	1600 to 1800	—	—	France
Madawaska ¹⁰	BFM	140	—	300, 600	P ..	2000 to 2200	0.40 ⁸	—	Australian Commonwealth
Maddox ¹⁰	NETX	—	Navy	300, 600	P ..	0930 to 1030	—	—	
						1200 to 1300	0.40 ⁸	—	
						1400 to 1430	—	—	
						1630 to 1730	—	—	
						2030 to 0030 (ship's time)	—	—	
						X	0.40	—	Italy
						X	0.40	—	Great Britain
						X	0.40	—	Great Britain
						X	0.40 ¹¹¹	—	Great Britain

SUE-MER	PGI	100-150	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Madiden ¹	..	200	Compagnie Française, de Navigation à Vapeur, Cyprien Fabre & Cie, Marseilles	300, 600	P G ^N	N	0.40	—	France
Madonna ¹	..	160	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	X	0.40	—	Great Britain
Madras City ¹⁹	..	200	Figuerola y Campos, Madrid and Valencia	300, 600	P G	N	0.40	—	Japan
Madras Maru ¹	..	150	Navy	300, 600	P G	N	0.30	3.00	Spain
Madrid ¹	..	—	(Armateur) With Wilhelmson, Christiania	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Madrona ⁹⁹	..	100-150	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Norway
Madrono ¹	..	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Madura ¹⁹	..	—	Braun & Blanchard, Calle Blanco, 855 Valparaiso	300, 600	P G	X ⁴⁴	0.40	—	Great Britain
Maetsuycker ¹	..	200	Afrikaansche Aandartsges. Aktiebolaget, Gothenburg	300, 600	P G	X	0.40	4.00	Dutch East Indies
Magallanes ¹	..	250	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	300, 600	P	..	0.40	4.00	Chile
Magda ¹	..	250	A. C. Lensen's Stoomvaart Maatschappij, Terneuzen	—	—	—	—	—	Sweden
Magdala ⁴⁰	..	145	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 600	P G	X	0.40	—	Denmark
Magdala YGS ¹⁹	..	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Magdalena ¹	..	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 600	P G	X	0.40	4.00	Holland
Magdalene Vinnen ³⁵	..	150	Maurice Bernard, Boulogne-sur-Mer	300, 450, 600	P G	X	0.40	—	Germany
Magdapur ⁷¹	..	150	Navy	300, 600	P G	X	0.40	—	Great Britain
Magellan ⁷¹	..	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	—	—	—	—	—	Great Britain
Magenta ¹	..	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	—	—	—	—	—	France
Maggiore Tosselli	..	—	U.S. Shipping Board, Washington (D.C.)	—	—	—	—	—	Italy
Magistar ⁷¹	..	250	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Magmeric ⁹⁷	..	300	Eastern Extension, Australasia & China Telegraph Co., Ltd.	300, 600	P G	X	0.40	—	United States of America
Magnet ⁷¹	..	140	Navy	—	P ³⁹	X	—	—	Sweden
Magnolia GFAY	..	—	Navy	300, 600	P G	—	—	—	Great Britain
Magnolia NAPS ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Magon ¹⁰	FBTM	—	Navy	300, 800	P G	N	0.05	—	France
Magnie ¹⁰	GDTP	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Magnukook ¹⁰⁸	WJJO	300	—	300, 600	P G	N	0.40	—	United States of America
Magvy ¹	FWD	300	Gillet & Fils, Lyons	300, 600	P G	X	0.40	—	France
Maachalakri	HGL	—	Royal Yacht	300, 600	O	N	—	—	Spain
Mahan ¹⁰	NEQK	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Mahana ¹⁰	LTV	240	—	300, 600	P G	X	0.40 ¹¹²	—	United States of America
Mahanada ⁷¹	GVJ	125	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Mahanna ^{9 121}	KKP	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	Great Britain
Mahanaa NURB ¹⁰²	NURB	—	—	300, 600	P G	N	—	—	United States of America
Maharaja ¹⁰	GDVR	—	—	300, 600	P G	X	0.40	—	United States of America
Maheno ⁷¹	GDZT	325	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	0.20	—	Great Britain
Mahia ¹⁰	LTW	200	—	300, 600	P G	X	0.40	—	Great Britain
Mahmoudieh ¹⁰	GCMB	—	—	300, 600	P G	X	0.40	—	Great Britain
Mahon ³	EFN	150	Compania Islena Maritima, Barcelona	300, 600	P G	X	0.40	—	Great Britain
Mahopac NETD ^{9 121}	NETD	—	—	300, 600	P G	N	0.30	3.00	Spain
Mahopac YQM ¹⁰	YOM	160	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Mahratta ⁷¹	OCM	160	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 600	P G	X	0.40 ¹¹²	—	Great Britain
Mahronda ¹⁰	EKM	180	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 600	P G	X	0.40	—	Great Britain
Mahroussa	SUA	450	KFriedval Yacht	300, 600, 800, 1,000	P	—	—	—	Great Britain
Mahsud ¹⁰	XFC	140	—	300, 600	P G	X	0.40	—	Egypt
Maidan ⁷¹	GVN	125	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 600	P G	X	0.40	—	Great Britain

Ship	Class	Year	Builder	Owner	Capacity	Speed	Range	Notes
Maid of Chios ¹⁵	GBFY	1891	—	—	300, 600	10.0	1,000	Great Britain
Maid of Corfu ¹⁵	GDKT	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Crete ¹⁵	GFNX	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Delos ¹⁵	GFNW	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Lemnos ¹⁵	GBFS	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Milos ¹⁵	GILD	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Orleans ¹⁵	ENJ	1891	—	—	300, 600	10.0	1,000	Great Britain
Maid of Patras ¹⁵	GBPN	1891	—	—	300, 600	10.0	1,000	Great Britain
Maid of Psara ¹⁵	GJMY	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Sparta ¹⁵	GBWX	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maid of Syra ¹⁵	GBFN	1891	—	—	300, 600	10.0	1,000	Great Britain
Maidstone	GEYC	1891	—	—	300, 600	10.0	1,000	Great Britain
Maidar ¹⁵	LUQ	1891	—	—	300, 600	10.0	1,000	Great Britain
Maimoa ¹⁵	GDPZ	1891	—	—	300, 600	10.0	1,000	Great Britain
Maimyo ¹⁵	XJO	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Court ¹⁵	EPC	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maindy Dene ¹⁵	YIL	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Grange ¹⁵	YDR	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Hill ¹⁵	YQV	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Lodge ¹⁵	VZBU	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Manor ¹⁵	EPB	1891	—	—	300, 600	10.0	1,000	Great Britain
Maindy Priory ¹⁵	GCEN	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maine FUM ¹	FUM	1891	—	—	300, 600	10.0	1,000	Great Britain
Maine GDCK ¹⁵	GDCK	1891	—	—	300, 600	10.0	1,000	Great Britain
Maine KUQ ¹⁵	KUQ	1891	—	—	300, 450, 600	10.0	1,000	Great Britain
Maine MWB ¹	MWB	1891	—	—	300, 600	10.0	1,000	Great Britain
Maine NJL ¹⁵	NJL	1891	—	—	300, 600	10.0	1,000	Great Britain
Maine CAM ¹⁵	CAM	1891	—	—	300, 600	10.0	1,000	Great Britain
Maine CDH ¹	CDH	1891	—	—	300, 600	10.0	1,000	Great Britain
Mainland No. 1 ¹⁵	WLE	1891	—	—	300, 600	10.0	1,000	Great Britain
Majestic BEX ¹⁵	BEX	1891	—	—	300, 600	10.0	1,000	Great Britain
Majestic GFVV ¹⁵	GFVV	1891	—	—	300, 450, 600, 2,100, 2,200, 2,400	10.0	1,000	Great Britain
Major Albert G. Force ²	WYAO	1891	—	—	300, 600	10.0	1,000	Great Britain
Major Albert G. Jenkins ¹⁰²	WYBV	1891	—	—	300, 600	10.0	1,000	Great Britain
Major Carl A. Lohr ¹⁰²	WYHT	1891	—	—	300, 600	10.0	1,000	Great Britain
Major Evan Thomas ²	WVAO	1891	—	—	300, 600	10.0	1,000	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Major Guy Howard ² ..	WZY	100	Bureau of Lighthouses, Dept. of Commerce Washington, (D.C.)	400	O ..	X	—	—	United States of America
Major John McKie ² ..	WYBX	—	—	300, 600	PG ..	N	—	—	United States of America
Major Lester E. Moreton ² ..	WYBU	—	—	300, 600	PG ..	N	—	—	United States of America
Major Samuel Ringgold ..	WYAC	100	Navy	300	O ..	X	—	—	United States of America
Major Wheeler ² ..	WFII	300	Baltimore S.S. Company	300, 450, 600	PG ..	X	0.40	—	United States of America
Major William P. Pence ¹⁰² ..	WYBW	—	—	300, 600	PG ..	N	—	—	United States of America
Makalla ¹⁸ ..	ESA	155	—	300, 600	PG ..	X	0.40	—	Great Britain
Makambo ¹ ..	VZB	240	—	300, 600	PG ..	1000 to 1100 1200 to 1300 1400 to 1430 1630 to 1730 1900 to 2030 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Makena ⁹⁷ ..	WMAI	200	Matson Navigation Co. ..	300, 450, 600	PG ..	X	0.40	—	United States of America
Makrelen ¹ ..	OWM	—	Navy	600	O ³⁹ ..	X	—	—	Denmark
Makura ⁷¹ ..	GDZV	250	Amalgamated Wireless (Australasia) Ltd.	300, 450, 600	PG ..	X	0.40 ²¹	—	Great Britain
Makut Rajakumara ..	HGH	—	Navy	300, 600	O ..	N	—	—	Siam
Malacca Maru ¹ ..	JNG	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	PG ..	0800 to 1100 1400 to 1700 2000 to 2100	0.40	—	Japan
Malaga ³⁵ ..	DXC	60	—	300, 600	PG ..	X	0.40	—	Germany
Malakand ¹⁹ ..	MKK	200	Operated by T. & J. Brocklebank Ltd., Cunard Building, Liverpool	300, 600	PG ..	X	—	4.00	Great Britain
Malakuta ⁷¹ ..	GVI	125	Operated by T. & J. Brocklebank Ltd., Cunard Building, Liverpool	300, 450, 600	PG ..	X	0.40	—	Great Britain
Malnucha ⁷¹ ..	XJP	125	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 600	PG ..	X	0.40	—	Great Britain
Malang ¹ ..	TZA	100	Government (Dept. of Marine and Fisheries)	300, 600, 800	PG ..	X	0.40	—	Holland
Malautian ¹⁹ ..	EML	170	—	300, 600	PG ..	X	0.40	—	Great Britain
Malaspina ² ..	VDU	100	Osaka	300, 600	O ..	X	—	—	Canada
Malay Maru ¹ ..	JEM	400	Osaka Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG ..	0800 to 1100	0.40	—	Japan

Line	Company	Flag	Tonnage	Port of Origin	Destination	Agent	Rate	Remarks	Remarks
Malaya GEBX	Malaya GJBW ¹⁹	Malaya OIEA	—	—	—	—	—	—	Great Britain
Malaya GJBW ¹⁹	Malaya OIEA	—	350	—	—	—	—	—	Great Britain
Malaya OIEA	—	—	—	—	—	—	—	—	Denmark
Malayan ²¹	—	—	—	—	—	—	—	—	Great Britain
Malcolm	—	—	—	—	—	—	—	—	Great Britain
Malda ¹⁹	—	—	—	—	—	—	—	—	Great Britain
Maha ²¹	—	—	125	—	—	—	—	—	Great Britain
Malicteuse ²¹	—	—	—	—	—	—	—	—	France
Malines ²¹	—	—	—	—	—	—	—	—	Great Britain
Mallaig ²¹	—	—	—	—	—	—	—	—	Great Britain
Mallard ²⁹	—	—	—	—	—	—	—	—	United States of America
Mallina ¹	—	—	300	—	—	—	—	—	Australian Commonwealth
Mallorca ²	—	—	300	—	—	—	—	—	Spain
Mallow ²¹	—	—	—	—	—	—	—	—	Australian Commonwealth
Malmanger ¹	—	—	100-150	—	—	—	—	—	Norway
Malmen ¹	—	—	250	—	—	—	—	—	Sweden
Malmesbury ¹⁹	—	—	—	—	—	—	—	—	Great Britain
Malmö ²¹	—	—	100	—	—	—	—	—	Sweden
Maloja ¹⁹	—	—	—	—	—	—	—	—	Great Britain
Malta Maru ¹	—	—	400	—	—	—	—	—	Japan
Malte ¹	—	—	300	—	—	—	—	—	France
Malvern ²¹	—	—	—	—	—	—	—	—	Great Britain
Malvolio ¹⁹	—	—	—	—	—	—	—	—	Great Britain
Malwa ¹⁹	—	—	250	—	—	—	—	—	Great Britain
Malyguin ²¹	—	—	150	—	—	—	—	—	Russia
Manari ¹⁹	—	—	200	—	—	—	—	—	Great Britain
Mameli ¹⁷	—	—	140	—	—	—	—	—	Italy

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimumer Radio-telegram.	
Maniéluk ..	FBLK	—	Navy	300, 800	P G ..	N	0.05	—	France
Mammoth ..	FBMH	—	Navy	300, 800	P G ..	N	0.05	—	France
Manaar ¹⁹ ..	LUR	200	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 600	P G ..	X	0.40	—	Great Britain
Manáos ¹⁵ ..	SRS	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Manaquí ⁷¹ ..	GFYZ	500	Operated by the Tropical Radio Telegraph Co., 131, State Street, Boston (Mass.)	300, 600	P G ..	N	0.40	—	Great Britain
Manatarny ..	KDFM	—	U.S. Shipping Board, Washington	300, 600	P G ..	X	0.40	—	United States of America
Manatee ^{9 131} ..	KURN	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Manavi ¹⁹ ..	GYO	170	—	300, 600	P G ..	N	0.40	—	Great Britain
Manche (1.a) ..	FYY	—	Société de l'Ecole Pratique de Pêche, Boulogne-sur-Mer	—	P G ..	X	0.40	—	France
Manchester Brigade ¹⁰ ..	EKW	155	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester City ¹⁰ ..	GBDT	190	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Civilian ¹⁰ ..	ZQV	155	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Corporation ¹⁰ ..	YYB	155	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Division ¹⁰ ..	ELZ	140	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Exchange ¹⁰ ..	ZQW	170	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Hero ¹⁰ ..	ZBE	170	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain
Manchester Importer ¹⁰ ..	ZQY	170	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 2000 to 2300	0.40	—	Great Britain

Manchester Mariner ¹⁸	ZQZ	170	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Merchant ¹⁹	ZQL	165	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Port ¹⁹	ZQN	160	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Producer ¹⁹	ZNH	200	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Regiment ¹⁹	GJMN	—	—	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Shipper ¹⁹	ZOF	160	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchester Spinner ¹⁹	ZNC	140	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchuria ¹⁰⁸	WWE	300	Atlantic Transport Company, 9, Broadway, New York (N.Y.)	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manchurian ¹⁹	GBFX	—	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manchurian Prince ¹⁹	ETV	—	—	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Mandala ¹⁹	YIJ	230	British India S.N. Co., Ltd.	300, 600, 2,100, 2,200 G.W.	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Mandalay ⁷¹	GWP	150	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Mandasan Maru ¹	JYJ	400	Mitsui Bussan Kaisha	300, 600, 1,800	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Japan
Mandasor ⁷¹	GCXB	125	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Manderan ¹	TWH	200	Stoomvaart Maatschappij Neder- land, Amsterdam	300, 450, 600, 800	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Holland
Mandovi ¹⁹	PSE	100-150	Navy	300, 600	O	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	—	Portugal
Mandul ¹	STZ	150	Lage & Irmãos, Rio de Janeiro	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Brazil
Mandu HQE ¹	HQE	200	Transports Maritimes de l'Elat	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	France
Mandela ¹⁹	GDMV	—	Operated by T. & J. Brocklebank, Ltd.	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Mangalore ⁷¹	GCXP	125	Navy	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Mangini ¹⁹	FBMG	—	Guaranty Trust Company	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.05	United States of America
Mangrove ⁸⁹	KHP	150	Navy	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manham ¹⁰⁸	NANV	—	Navy	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manhattan ¹⁹	KORS	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manhattan GBLD ¹⁹	GBLD	250	Navy	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manhattan NEKZ ²	NEKZ	—	Navy	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America
Manhattan Island ^{9 131}	WEOI	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
Manila Maru ¹	JMR	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600, 1,800	P G	N	0.40	—	Japan
Manin ¹⁷	UST	140	Società Veneziana di Navigazione à Vapore, Venice	300, 600	P G	X	0.40	—	Italy
Manipur ⁷¹	GCXR	125	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Manistee ¹⁹	GDCX	—	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	Great Britain
Manitoba HVQ ¹	HVO	250	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	X	0.40	—	France
Manitoba VGH ²¹	VGH	200	Michigan Transportation Co.	300, 600	P G	X ²⁷	0.40	—	Canada
Manitou WFW ^{9 231}	WFW	150	Manitowoc S.S. Corporation	300, 600	P G	N	0.20	—	United States of America
Manitowoc ⁹⁷	KRO	300	Kobe Seikojo	300, 600	P G	X	0.40	—	United States of America
Manju Maru ¹	JBNA	400	Navy	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Manley ⁹⁹	NSH	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Manligheten	—	—	Navy	—	O ³⁹	—	—	—	Sweden
Mannheim ¹	UFC	300	Transports Maritimes de l'Etat	300, 600	P G	2 12	0.40	—	France
Manning ⁸	NRN	150	U.S. Coastguard Treasury Dept., Washington (D.C.)	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Manoa GFQS ⁷¹	GFQS	—	Operated by the Canada S.S. Lines, Ltd., 9-11, Victoria Street, Montreal, (P.Q.)	300, 800	P G	X	0.40	—	Great Britain
Manoa WMQ ^{9 231}	WMQ	300	Matson Navigation Company, 268, Market St., San Francisco (Cal.)	300, 450, 600	P G	N	0.40	—	United States of America
Mandla ¹	TIP	100	Italia y Compania, Bilbao	300, 600	P G	N	0.30	—	Spain
Manora ¹⁹	GIT	230	—	300, 600	P G	X	0.40	3.00	Great Britain
Manordillo ¹⁹	GBJY	—	—	300, 600	P G	X	0.40	—	Great Britain
Manouba ^{56 1}	FXB	200	Compagnie de Navigation Mixte à Vapeur, Marseilles	300, 600	P G	X	0.10	—	France
Manshu ¹	IUT	—	Navy	—	O	—	—	—	Japan
Manshu Maru ¹	JNX	400	Dairen Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Mansourah FXZ ^{54 1}	FXZ	150	Compagnie de Navigation mixte à Vapeur, Marseilles	300, 600	P G	X	0.10	—	France
Mansourah GFJQ ¹⁹	GFJQ	—	Cia Peruana Vap y Dique del Callao (Armateur)	300, 450, 600	P G	X	0.40	—	Great Britain
Mantaro ⁵¹	OCM	250	With Wilhelmsen, Christiania	300, 600	P G	X	0.40	—	Peru
Mantilla TPG ^{1 2}	TPG	100-150	—	300, 600	P G	X	0.40	4.00	Norway

Mantis	GFOS	Navy	300, 600	P G	—	—	—	Great Britain
Manto ¹	AGAH	(Armateur) B. Stolt Nielsen, Haugesund	300, 600	P G	—	—	—	Norway
Mantola ¹⁹	GDMY	—	300, 600	P G	—	—	—	Great Britain
Mantua ¹⁹	MME	—	300, 600, 2,100, 2,200 C.W.	P G	—	—	—	Great Britain
Manu ¹	TJS	Compañia Naviera Amaya, San Sebastian	300, 600	P G	—	—	—	Spain
Manuch ¹	TMZ	Compañia Naviera Bachi, Bilbao	300, 600	P G	—	—	—	Spain
Manuel Arnus ¹	TOA	Compañia Transatlantica, Barcelona	300, 600	P G	—	—	—	Spain
Manuel Calvo ¹	EDM	Compañia Transatlantica, Barcelona	300, 600	P G	—	—	—	Spain
Manuel Espala ¹	CXE	Compañia de Navegacion Fabregas y Garcia, Barcelona	300, 600	P G	—	—	—	Spain
Manuela Pla ¹	CXP	Compañia de Navegacion Fabregas y Garcia, Barcelona	300, 600	P G	—	—	—	Spain
Manuka ⁷¹	GDZW	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	—	—	—	Great Britain
Manukai ^{9 131}	KDSF	Matson Navigation Company, 268, Market Street, San Francisco (Cal.)	300, 450, 600	P G	—	—	—	United States of America
Manulani ^{9 131}	KDRQ	Matson Navigation Company, 268, Market Street, San Francisco (Cal.)	300, 450, 600	P G	—	—	—	United States of America
Manurewa ⁴	CGO	—	200, 300, 600	P G	—	—	—	Australian Commonwealth
Maunx Isles ¹⁹	LTR	—	300, 600	P G	—	—	—	Great Britain
Manxman	GFPS	Operated by the Owners, Isle of Man Steam Packet Co., Ltd., Imperial Buildings, Douglas Admiralty	300, 600	P G	—	—	—	Great Britain
Manxman GPS ⁷¹	GPS	U.S. Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 600	O	—	—	—	Great Britain
Manzanara ¹⁹	MLS	U.S. Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	600, 759, 1,000	P G	—	—	—	United States of America
Manzanita ³	NLU	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	—	—	—	Great Britain
Maori ⁷¹	GDZX	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	—	—	—	Great Britain
Mapia ¹	TWI	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	—	—	—	Holland
Maple MSP ¹⁹	MSP	—	300, 600	P G	—	—	—	Great Britain
Maple NAPV ²	NAPV	U. S. Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 600	O	—	—	—	United States of America
Maple Branch ⁷¹	ZIV	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	—	—	—	Great Britain
Maplecourt ⁴¹	VGFB	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600, 800	P	—	—	—	Canada
Mapledawn ²	VGDN	Montreal Transportation Co., Ltd., Montreal (P.Q.)	300, 600, 800	P G	—	—	—	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Maplenore ¹⁹	ZND	170	—	300, 600	P G	X	0.40	—	Great Britain
Mapleton ²¹	VGDR	200	Canada Steamship Lines, Ltd., Montreal (P.Q.)	300, 600	P	— ²⁷	0.40	—	Canada
Mapocho ¹	CDG	200	Cia Sud-Americana de Vapores, Calle Blanco, 895 Valparaiso	300, 600	P G	X	0.40	4.00	Chile
Mapourika ²	VLS	150	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—	New Zealand
Maquan ²⁷	KOVD	300	U.S. Shipping Board, Washington (D.C.)	300, 600 1,800	P G	X	0.40	—	United States of America
Maracaibo ^{9 121}	KDM	300	Atlantic and Caribbean Steam Navigation (Redd Line) 82, Wall Street, New York (N.Y.)	300, 450 600	P G	N	0.40	—	United States of America
Mar Adriatico ¹	TJT	200	Compañia Marítima del Nervion, Bilbao	300, 600	P G	N	—	—	Spain
Maraglio ¹	HEQ	150	Van der Eb en Dresselhuys' Scheepvaart Maatschappij, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Marahú ¹⁵	PUR	150	Companhia de Navegação Bahiana, São Salvador (Bahia)	300, 600	P G	N	0.40	—	Brazil
Marama ⁷¹	GDZY	250	Anaigmated Wireless (Australia), Ltd.	300, 600	P G	X	0.40 ⁹¹	—	Great Britain
Maranguape ²	PUM	400	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	4.00	Brazil
Maranhão ¹⁵	SRK	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Mararua ³	VMZ	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—	New Zealand
Maraval ⁷¹	VRX	—	Bermuda and West Indies Steamship Co., Ltd.	—	—	—	—	—	Bermuda
Maravi ⁷¹	GFZB	500	Operated by the Tropical Radio Telegraph Co., 131, State St., Boston (Mass.)	300, 600	P G	N	0.40	—	Great Britain
Marazion ⁷¹	GKIY	—	Navy	—	—	—	—	—	—
Mar Azoff ¹	TLP	200	Compañia Marítima del Nervion, Bilbao	300, 600	P G	N	0.30	3.00	Great Britain
Mar Blanco ¹	TJU	200	Compañia Marítima del Nervion, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Marblehead ¹⁰²	NIRR	—	Navy	300, 600	P G	N	—	—	United States of America
Marbre ⁷¹	FBSM	—	Compañia Marítima del Nervion, Bilbao	300 800	P G	N	0.05	—	France
Mar Cantabrico ¹	CXR	150	—	300, 600	P G	N	0.30	3.00	Spain

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Mar Carlie ¹	1JV	200	Compagnia Marittima del Nervion, Bilbao	300, 600	P G	..	N	0.30	3.00	Spain
Mar Caspio ¹	..	..	EFG	200	Compagnia Marittima del Nervion, Bilbao	300, 600	P G	..	N	0.30	3.00	Spain
Marassin	..	..	FBWM	—	Navy	300, 800	P G	..	N	0.05	—	France
Marcato ¹	..	..	SML	150	Konsul H. K. H. Pohlmann, Strängen	300, 600	P	..	N	0.40	4.00	Sweden
Marco Minghetti ¹⁷	..	..	INH	140	Sicilia Società di Navigazione, Rome	300, 600	P G	..	X	0.40	—	Italy
Marconi ¹⁹	..	..	ZBC	230	Lloyd Royal Belge, Antwerp	300, 600	P G	..	N	0.40	—	Great Britain
Marconier ¹⁰	..	..	OPQ	75-100	Navy	300, 600	P G	..	X	0.40	4.00	Belgium
Marcus ⁹⁹	..	..	NUMG	—	..	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Mar del Irlanda ¹	..	..	TMF	150	Compagnia Marittima del Nervion, Bilbao	300, 800	P G	..	N	0.30	3.00	Spain
Mar del Norte ¹	..	..	CXF	150	Compagnia Marittima del Nervion, Bilbao	300, 600	P G	..	N	0.30	3.00	Spain
Mar del Plata ²	..	..	TJW	150	Compagnia Marittima del Nervion, Bilbao	300, 600	P G	..	N	0.30	3.00	Spain
Mardinian ¹⁹	..	..	GBWN	—	Compagnie Générale Transatlantique, Paris	300, 600	P G	..	X	0.40	—	Great Britain
Marchal Bugeaud ¹⁸¹	..	..	FGY	200	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	..	N	0.10	—	France
Marchal Gallieni ¹	..	..	UEZ	200	..	300, 600	P G	..	X	0.40	—	France
M. A. Reeb	..	..	KDUZ	150	American S.S. Company	300, 600	P G	..	X	—	—	United States of America
Marella ⁷¹	..	..	GBKJ	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	P G	..	X	0.40	—	Great Britain
Marengo ¹⁹	..	..	GBFD	170	..	300, 600	P G	..	X	0.40	—	Great Britain
Maresfield ¹⁹	..	..	YOK	140	..	300, 450, 600	P G	..	X	0.40	4.00	Great Britain
Marga Hemsoth ²¹	..	..	DMG	200	..	300, 450, 600	P G	..	X	0.40	—	Germany
Margaret KUOS ²	..	..	KUOS	—	Red Salmon Canning Company..	300, 600	P G	..	—	—	—	United States of America
Margaret KZO ¹⁸³	..	..	KZO	200	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Margaret VDW ²	..	..	VDW	150	Govt. Station (Dept. of Customs, Ottawa, Ont.)	300, 600	O	..	X	—	—	Canada
Margaret Coughlan ²	..	..	VGCD	250	J. Coughlan & Sons, Ltd., Vancouver, B.C.	300, 600	P	..	— ²⁷	0.40	—	Canada
Margaret Dollar ¹⁸³	..	..	KDUV	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	..	X	0.40	—	United States of America
Margari ¹	..	..	TJX	200	Compagnia Naviera Amaya, San Sebastian	300, 600	P G	..	N	0.30	3.00	Spain
Margarita ¹	..	..	THM	100-150	M. C. Stamatoopoulos Sons, Piraeus	300, 600	P G	..	X	0.40	4.00	Greece
Margaux ¹	..	..	FWX	200	Worms & Cie, Paris	300, 600	P G	..	X	0.40	—	France
Margha ¹⁹	..	..	BOY	170	..	300, 600, 2,100, 2,200 c.w.	P G	..	X	0.40	—	Great Britain
												0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.	Country.
Margit Skogland ¹	TSM	242	(Armateurs) T. H. Skogland & Son, A/S Haugesund	300, 600	P G	X	4.00	Norway
Marguerite VI	FAPM	—	Navy	300, 800	P G	N	0.05	France
Marguerite GABQ	GABQ	—	Navy	—	P G	—	—	Australian Commonwealth
Marguerite GFZJ (La)	GFZJ	—	—	300, 600	P G	X	1.00 ⁸²	Great Britain
Marguerite UKB ¹	UKB	200	Fourny et Cie, Boulogne-sur-Mer	300, 600	P G	X	0.40	France
Marguerite Marie ¹	FBO	200	Société la Pêche Français, Fécamp	300, 600	P G	N	0.40	France
Margus ^{9 131}	KONG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Mari ¹	TOS	100	Compañia Naviera Amaya, Bilbao	300, 600	P G	N	0.40	Spain
Maria de Larrinaga	EMA	170	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Maria de Molina	EHW	—	Navy	—	O	—	—	Spain
Maria Elena ¹	TJY	100	Luis Llano, Santander	300, 600	P G	N	0.30	Spain
Maria Milagros ¹	CML	150	Ampuero, Zubira y Cia., Bilbao	300, 600	P G	N	0.30	Spain
Maria Stathatos ¹	SWWS	150-200	D. A. Stathatos, Athens	300, 600	P G	X	0.40	Greece
Maria Victoria ¹	TOZ	200	Viuda de Astorqui, Bilbao	300, 600	P G	X	0.30	Spain
Marica ⁹⁷	KNK	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Maricopa ¹	LEE	100-150	(Armateur) Wilh. Wilhelmson, Christiania	300, 600	P G	X	0.40	Norway
Maridal	TQU	150-200	(Armateur) Trygve Sagen, Christiania	300, 600	P G	X	0.40	Norway
Marie ¹	SDI	150	Angfartys Aktiebolaget Pallas	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	Sweden
Marie Anne ¹	UIR	180	Société Pecheries et Armements La Rochelle Ocean, La Rochelle	300, 600	P G	—	0.40	France
Marie Gilbert ¹	UIV	180	Société Pecheries et Armements La Rochelle Ocean, La Rochelle	300, 600	P G	X	0.40	France
Marie Horn ³⁵	DFK	200	Compagnie Auxiliaire de Navigation	300, 600	P G	X	0.40	Germany
Marie Louise ¹	FZW	300	Société Pecheries et Armements La Rochelle Ocean, La Rochelle	300, 600	P G	X	0.40	France
Marie Mad ¹	UIW	180	Rederiet A. P. Møller, Copenhagen	300, 600	P G	X	0.40	Denmark
Marie Macrsk ⁴⁰	OGK	250	—	300, 450, 600	P G	X	0.40	Denmark

TSO	100-150	(Armateur) B. Stolt Nielsen, Haugesund A. & G. Vidor Fils, Boulogne-sur- Mer	300, 600	P G	Δ	0.40	—	France
Marie Nielson ¹⁰	150	FHM	300, 600	P G	X	0.40	—	Great Britain
Marie Rose FHM ¹	170	YEH	300, 600	P G	X	0.40	—	France
Marie Rose YEH ¹⁸	180	UIS	300, 600	P G	X	0.40	—	France
Marie Simonne ¹	200	FHS	300, 600	P G	X	0.40	—	France
Marie-Stella ¹	200	UKN	300, 600	P G	X	0.40	—	France
Marie-Thérèse ¹	180	UIT	300, 600	P G	X	0.40	—	France
Marie Thérèse II ¹	180	UIU	300, 600	P G	X	0.40	—	France
Marie Yette ¹	200	DBO	300, 600	P G	X	0.40	4.00	Germany
Mariefefs ³⁵	100-150	THN	300, 600	P G	X	0.40	4.00	Greece
Marie Z. Michalinos ¹	—	NAQV	300, 600	O	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Marigold ⁸⁹	250	UDK	300, 450, 600	P G	X	0.40	—	France
Marigot ⁵⁴	190	IVN	300, 600	P G	X	0.40	—	Italy
Marina IVN ¹⁷	150	KIVD	300, 450, 600	P G	N	0.40	—	United States of America
Marina KIVD ^{9 131}	140	IMO	300, 600	P G	X	0.40	—	Italy
Marina O ¹⁷	—	NIGV	300, 600	P G	N	—	—	United States of America
Marinduque ¹³⁵	200	KKEU	300, 600	P G	X	0.40	—	United States of America
Mariners Harbour ^{9 131}	190	YQW	300, 600	P G	X	0.40	—	Great Britain
Marinula ¹⁹	150	IWR	300, 600	P G	X	0.40	—	Italy
Mariquita ¹⁷	150	XVL	300, 600	P	— ²⁷	0.40	—	Canada
Mariska ²¹	150-175	ASH	300, 600	P G	X	0.40	4.00	Norway
Marita ¹	100	TMX	300, 600	P G	N	0.30	3.00	Spain
Mari-Tere ¹	—	GBMQ	300, 600	P G	X	0.40	—	Great Britain
Maritime ¹⁹	150	UID	300, 600	P G	X	0.40	—	France
Marius Chambon ¹	150	PZG	300, 450, 600	P G	X	0.40	4.00	Holland
Marken ¹	150-200	ONKA	300, 600	P G	X	0.40	4.00	Belgium
Marksburg ¹⁰	—	GEBY	—	P G	—	—	—	Great Britain
Marborough	105	GFEC	—	P G	—	—	—	Great Britain
Marlow	200	EKO	300, 600	P G	X	0.15 ⁸⁴ 0.40	1.50 ⁸⁴	Great Britain
Marwood ¹⁸	—	DTM	300, 450, 600	P G	X	0.40	4.00	Danzig (Free Town of)
Marmara ¹⁵	—		—	P G	—	—	—	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum Per Radio-gram.	
Mar Mediterraneo ¹	..	150	Compañia Maritima del Nervion, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Marnevo ¹	..	200	Van der Eb en Dresselhuys Scheepvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Marne FBH ¹	..	300	Société des Usines Métallurgiques de la Basse-Loire, Paris	300, 600	P G ..	X	0.40	—	France
Marne FBZM	..	—	Navy	300, 800	P G ..	N	0.05	—	France
Marne KEDJ	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Marne PVI ¹⁵	..	250	Compañia Lloyd Nacional, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil.
Mar Negro ¹	..	200	Compañia Maritima del Nervion, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Marinetown ¹⁵	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
M. Amos ¹	..	150	Hijos de José Taya, Barcelona ..	300, 600	P G ..	N	0.30	3.00	Spain
Maroc ¹	..	180	Joseph Huret, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Marocain	—	Navy	300, 800	P G ..	X	0.05	—	France
Maronian ¹⁵	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Marore ^{1 151}	..	300	Guaranty Trust Company of New York.	300, 600	P G ..	X	0.40	—	United States of America
Matoudio Inglessi ¹	..	100-150	The Oriental Shipping Co., Ltd., Athens	300, 600	P G ..	X	0.40	4.00	Greece
Marquesa ¹⁵	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Marques de Chavarri ¹	..	150	Altos Hornos de Viscaya, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Marques de Urquijo ¹	..	250	Altos Hornos de Viscaya, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Marques de la Victoria	150	Navy	300, 600	O ..	N	0.30	—	Spain
Marques del Campo ¹	..	150	Compañia Transmediterranea, Barcelona	300, 600	P G ..	N	0.30	—	Spain

Marques del Turia ¹	HLT	150	Compañia Marítima del Nervion, Bilbao	300, 450, 600	P G	X	0.40	United States of America
Marquette and Bessemer No. 2 ²	WEX	200	U.S. Shipping Board, Washington	300	O	N	—	Morocco
Marrakechi	CNM	120	Ship Belonging to the Morocco Customs Administration	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁴	Australian Commonwealth
Marawah ¹	VZZ	300	—	300, 600	P G	N	0.30	Spain
Mar Rojo ¹	ECH	200	Compañia Marítima del Nervion, Bilbao	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Mars NTR ⁴⁹	NJR	—	Navy	300, 600	P G	X	0.40	Belgium
Mars ORF ¹⁰	ORF	100-150	Association Maritime Belge, Antwerp	300, 600	P G	X	0.10	France
Marsa FXR (La) ^{55 1}	FXR	200	Compagnie Navigation Mixte à Vapeur, Marseilles	300, 600	P G	X	0.10	France
Marsa (La) ¹	FXS	350	Compagnie de Navigation Mixte 54, Rue Cannabière, Marseilles	450, 600	P G	X	—	Italy
Marsala IKB	IKE	—	Navy	—	P G	X	0.40	Italy
Marsala IPS ¹²	IPS	140	Esercizio Navigazione di Stato, Rome	300, 450, 600	P G	X	0.15 ⁸² 0.05	Great Britain
Marsden ¹⁰	BIJ	105	Navy	300, 600	P G	X	0.40	France
Marsellaise FADM	FADM	—	—	300, 800	P G	X	0.40	Norway
Marsellaise UAW (La) ¹	UAW	250	Compagnie de Navigation Mixte 34, Rue Cannabière, Marseilles	300, 600	P G	X	—	Great Britain
Marshall ¹	AUU	—	(Armateur) Henrik Oster-vold, Christiania	300, 450, 600	P G	X	—	Australian Commonwealth
Marshall Soult	GEXF	—	Navy	—	P G	—	0.20 ⁸ 0.40 ⁵	United States of America
Marsina ¹	VKY	240	—	300, 600	P G	—	—	Norway
Marsodak ⁹⁷	KOCM	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	Great Britain
Marstenen ¹	TPZ	150	(Armateur) Vilhelm Torkildsen, Bergen	300, 450, 600	P G	X	—	Spain
Martaban ²¹	GWC	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	N	0.30	Italy
Marte CMM ¹	CMM	150	Compañia Anonima Maritima Union, Bilbao	300, 600	P G	X	0.40	Spain
Marte, IVF ¹⁷	IVF	140	Società Navigazione Ligure di Armamento, Genoa	300, 600	P G	N	—	United States of America
Mar Tirreno ¹	ECM	150	Compañia Marítima del Nervion, Bilbao	300, 600	P G	N	0.30	—
Martha Washington ⁹⁷	KUQF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-tele-gram.	
Martha Hemsoth ³⁵	DMB	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Martha Woermann ³⁵	DWW	150	Société Anonyme les Chahutiers de La Rochelle, La Rochelle (Armateur) Jacob Christensen, Bergen	300, 600	P G	X	0.40	4.00	Germany
Mathilda ¹	FDN	300	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 450, 600	P G	X	0.40	4.00	France
Martian ²¹	CKH	150	Phillips Izquierd y Cia, Cadiz	300, 600	P	— ²⁷	0.40	—	Norway
Martin Saenz ¹	ECZ	300	Compagnie Nantaise de Navigation à Vapeur, Nantes	300, 600	P G	N	0.30	—	Canada
Martinier ¹	UFR	250	Compagnie Générale Transatlantique, Paris	300, 600	P G	— ²⁷	0.40	—	Spain
Martinique FTM ¹	FTM	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	— ²⁷	0.40	—	France
Martinique KUQL ^{9 131}	KUQL	200	Pioneer S.S. Company	300, 450, 600	P G	X	0.40	—	United States of America
Martin Mullen ^{9 131}	KDXY	150	Inter-Coast Steamship Company, 148, State St., Boston (Mass.)	300, 600	P G	X	0.10 ¹¹⁹	—	United States of America
Maruba ¹⁰³	WZEE	200	(Armateurs), A/S Nordstjernen, Fred Olsen & Co., Christiania	300, 600	P G	X	0.40	—	United States of America
Marvel ¹	AWK	150-200	Aktieselskabet Dampskifsselskabet Dania, Esbjerg	—	P G	—	0.40	4.00	Norway
Mary ⁴⁶	—	—	Bull Insular S.S. Co., 17, Battery Place, New York (N.Y.)	—	—	—	—	—	Denmark
Mary KTOE ¹⁰³	KTOE	200	Luckenbach Terminals	300, 450, 600	P G	X	0.40	—	United States of America
Mary Amelia ¹⁹	GBRM	170	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	Great Britain
Mary Horlock ¹⁹	GBNZ	300	Navy	300, 600	P G	X	0.40	—	Great Britain
Mary Luckenbach ^{9 131}	KDLX	300	Atkieselskabet det Forende Dampskib-Selskab, Copenhagen	300, 600	P G	X	0.40	—	United States of America
Maryland FXD ¹	FXD	200	Great Central Railway Co., Glasgow, Bilbao	300, 600	P G	X	0.40	—	France
Maryland MBW ¹⁹	MBW	170	Compagnia Bilbaina de Navegacion, Bilbao	300, 600	P G	X	0.40	—	Great Britain
Maryland NARC ⁹⁹	NARC	—	Etruria Società Anonima di Navigazione, Florence	300, 600	P G	X	0.40	—	United States of America
Maryland OXR ⁴⁶	OXR	350	Atkieselskabet det Forende Dampskib-Selskab, Copenhagen	300, 450, 600, 800	P G	X	0.40	—	France
Marylebone ⁷¹	YMQ	—	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40 ¹¹¹	—	Great Britain
Marzo ¹	CMQ	100	Navy	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Marzo ¹	—	—	Compagnia Bilbaina de Navegacion, Bilbao	300, 600	P G	X	0.40	4.00	Denmark
Marzo ¹	—	—	Etruria Società Anonima di Navigazione, Florence	300, 600	P G	X	0.15 ⁸²	—	Great Britain
Marzo ¹	—	—	Compagnia Bilbaina de Navegacion, Bilbao	300, 600	P G	X	0.30	—	Spain
Marzo ¹	—	—	Etruria Società Anonima di Navigazione, Florence	300, 600	P G	X	0.40	—	Italy

Line	Ship	Tonnage	Company	Port of Origin	Destination	Agent	Remarks
103	Masca	150	KIBL	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	United States of America
104	Masconomo	150	GTR	Standard Transport Co., Ltd.	300, 450, 600	P G	Hong Kong
105	Mascotte	150	KOW	Peninsular and Occidental S.S. Co., Exchange Building, New Haven (Conn.)	300, 600	P G	United States of America
106	Mascoutin	—	NIVP	U.S. Coast Guard	300, 600	P G	United States of America
107	Mashobra	—	GDMS	—	300, 600, 2,100, 2,200 C.W.	P G	Great Britain
108	Masilia	250	SIC	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, 600	P	Sweden
109	Masirah	190	MPX	—	300, 600	P G	Great Britain
110	Mason	—	NAGG	Navy	300, 600	P G	United States of America
111	Mason City	200	KUGX	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	United States of America
112	Massachusetts	—	NIRQ	Navy	300, 600	P G	United States of America
113	Massasoit	150	GTB	Standard Transport Co., Ltd.	300, 450, 600	P G	Hong Kong
114	Massic	300	KOPF	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	United States of America
115	Massilia	450	FSK	Compagnie Navigation de Sud-Atlantique, Paris	300, 600	P G	France
116	Massilia	230	MHO	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	Great Britain
117	Massilia	300	KONJ	—	300, 450, 600	P G	United States of America
118	Massis	145	ZZE	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	United States of America
119	Masuda	300	KMIU	Navy	300, 800	P G	France
120	Masue	—	FBMU	Navy	300, 800	P G	Great Britain
121	Mastodonte	—	FAMN	Navy	300, 800	P G	Great Britain
122	Masula	230	GBSQ	—	300, 600	P G	Great Britain
123	Matador	170	YTC	—	300, 600	P G	Great Britain
124	Matakana	—	GDX	—	300, 450, 600	P G	Great Britain
125	Matana	—	GMIF	—	300, 600	P G	Great Britain
126	Matanzas	200	WFEU	N.Y. & Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 450, 600	P G	United States of America
127	Mataram	60	PLY	Navy	300, 600	O ³⁰	Dutch East Indies
128	Mataram	240	VHU	—	300, 600	P G	Australian Commonwealth
129	Matatua	200	GBLJ	Navy	300, 600	P G	Great Britain
130	Matetot-Leblanc	—	FAXZ	—	300, 600	P G	France
131	Matheran	200	MMX	Operated by T. & J. Brooklebank, Ltd., Cunard Building, Liverpool	300, 600	P G	Great Britain
132	Mathura	125	GXXQ	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-tele-gram.	
Mariana ¹⁹	GDMZ	—	Peirce Brothers, Naples ..	300, 600	P G	X	0.40	—	Great Britain
Matilde Peirce ¹⁷	UPZ	140	..	300, 600	P G	X	0.40	—	Italy
Matina ¹⁸	MLT	190	Standard Oil Co. of N.J., Incorp.,	300, 600	P G	X	0.40	—	Great Britain
Matincock ¹¹¹	KID	300	26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Matoppe ¹⁰	MAM	145	Matson Navigation Company,	300, 600	P G	X	0.40	—	Great Britain
Matsonia ¹¹¹	WMP	300	268, Market St., San Francisco (Cal.)	300, 450, 600	P G	N	0.40	—	United States of America
Matsue Maru ¹	JOF	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700	0.40	—	Japan
Matsumoto Maru ¹	JODA	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	2000 to 2400 0800 to 1100	0.40	—	Japan
Matsuyama Maru ¹	JMW	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	2000 to 2400 0800 to 1100	0.40	—	Japan
Mattawa ²¹	YTT	180	Operated by the Marconi Wireless Telegraph Co., of Canada, Ltd.,	300, 600	P G	1400 to 1700 2000 to 2400 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Matti ¹	TUT	150-175	(Armateur), Alexander Bech, Christiania	300, 600	P G	X	0.40	4.00	Norway
Matto Grosso	SGG	60	Navy	300	O ¹⁸	—	0.40	—	Brazil
Mattole ¹⁶	NUGM	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Matura	VRY	—	Bermuda and West Indies Steamship Company, Ltd.	—	—	—	—	—	Bermuda
Mauban ⁵	KRAE	—	Cia. de Tabacos del Philippines Manila (Philippine Islands)	300, 600	—	—	—	—	United States of America
Maud F ²	KDBK	75	E. D. Burge	300, 600	P	X	—	—	United States of America
Maud ARW ¹	ARW	300	(Armateur) Hjalmar Roed & Co., Naes (Tonsberg)	300, 600	P G	X	0.40	4.00	Norway
Maud LWZ ¹	LWZ	300-600	(Armateur) Roald Amundsen, Svarstrog ¹	—	P G	X	—	—	Norway
Maudie ¹	TUW	215	(Armateur) N. Bugge, Tonsberg	300, 600	P G	X	0.40	—	Norway
Maui ¹¹¹	WMR	300	Matson Navigation Company, 268, Market St., San Francisco (Cal.)	300, 450, 600	P G	X	0.40	4.00	United States of America

Mauna Kea ^{9 131}	150	KDPD	Inter Island Steam Navigation Co.	300, 600	P G	X	0.40 ¹¹²	United States of America
Maunganui ⁷¹	250	GFYB	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	0.40 ⁹¹	Great Britain
Maureen ⁵⁰	100	OCI	—	300, 600	P G	X	1.00 ⁸⁷	Great Britain
Mauretania ⁷¹	350	MGA	Operated by Cunard S.S. Co., Ltd., Cunard Building, Liverpool	110, 300, 600, 2,100, 2,200, C.W.	P G	N	0.10 ⁸⁷ 0.40	Great Britain
Maurice Callot	—	FAPC	Navy	600, 800	P G	N	0.05	France
Mauritanie ¹	200	FYT	Joseph Hurst, Boulogne-sur-Mer	300, 600	P G	X	0.40	France
Mauritian ¹⁹	—	GDCN	—	300, 450, 600	P G	X	0.40	Great Britain
Maur'y ²⁸	—	NEPG	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Mayari ⁷¹	500	GDYX	Tropical Radio Telegraph Co., 131, State St., Boston (Mass.)	300, 600	P G	N	0.40	Great Britain
Mayaro	—	VRZ	Bermuda and West Indies Steam- ship Co., Ltd.	—	—	—	—	Bermuda
Mayebashi Maru ¹	400	JAEA	Nippon Yusen Kaisha	300, 600	P G	—	0.40	Japan
Mayflower NJV ⁸⁹	—	NJV	Navy	300, 600	P G	—	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Mayflower NZQ ²	—	NZQ	Bureau of Lighthouses, Dept. of Commerce, Washington (D.C.)	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Mayrant ⁸⁹	—	NJU	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Mayumbe ¹⁰	300	ORY	Compagnie Africaine de Naviga- tion, Antwerp	300, 600	P G	X	0.40	Belgium
Mazare	—	FAXR	Navy	600, 800	P G	N	0.05	France
Mazatlan	200	XBH	Lloyd Mexicano	300, 600	P G	X	0.40	Mexico
Mazzini ¹⁷	140	ILZ	Co-operativa Garibaldi Societa Anonima Co-operativa fra Lavo- ratori del Mare, Genoa	300, 600	P G	X	0.40	Italy
McCall ⁸⁹	—	NJW	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McCalla ⁸⁹	—	NIGC	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McCawley ⁸⁹	—	NULS	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McCook ⁸⁹	—	NIGB	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McCormick ¹⁰²	—	NUPZ	—	300, 600	P G	N	—	United States of America
McCourtly ¹⁰²	—	NEJV	—	300, 600	P G	N	—	United States of America
McCreary County ¹⁰²	—	KOQP	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
McDermut ⁸⁹	—	NIGG	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McDougal ⁸⁹	—	NIT	—	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
McFarland ⁸⁹	—	NETB	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
McKean ⁹⁸ ..	NEMT	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
McKee ⁹⁹ ..	NACQ	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
McKeesport ¹⁰³ ..	KEXB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40 ¹¹²	—	United States of America
McLanahan ⁹⁸ ..	NIGK	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meade ⁹⁹ ..	NEBJ	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meandros ¹ ..	SWNS	100-150	The National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meanticut ⁹⁷ ..	KDQH	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40 ¹¹²	4.00	Greece
Méanicien Principal Lestin	FB/L	—	Navy	300, 600, 1,800	P G ..	X	0.40	—	United States of America
Mecklenburg DFV ⁹⁴ ..	DFV	200	Navy	300, 800 300, 400, 600	P G .. P G ..	N	0.05	—	France
Mecklenburg GCXL ¹⁹	GCXL	—	—	300, 600	P R ⁸³ ..	X	0.40	—	Germany
Mecklenburg PDA	PDA	150	Stoomvaart Maatschappij Zeeland, Vlissingen	300, 600 300, 450, 600, 800	P G .. P G ..	X	0.40	— ⁸⁴	Great Britain Holland
Medan ¹ ..	PGA	150	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Media ¹⁹ ..	ZTC	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Median ¹⁹ ..	2.3 P	170	—	300, 600	P G ..	N	0.40	—	Great Britain
Medic ¹⁹ ..	MKK	250	—	300, 600	P G ..	X	0.40	—	Great Britain
Medici	IKB	—	Navy	—	—	X	—	—	Italy
Medina ¹⁰³ ..	KEI	300	Malory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Mediterraneo ¹ ..	UDY	300	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Mediterraneo UVD ¹⁷ ..	UVD	190	Lussino Società Anonima di Navigazione à Vapore, Lussimpiccolo	300, 600	P G ..	X	0.40	—	Italy
Medon ..	KDID	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Medusa AMD ¹ ..	AMD	—	Navy	300, 600	P G ..	N	—	—	Germany
Medusa NEMC ⁹⁹ ..	NEMC	—	Navy	300, 600	P G ..	N	—	—	United States of America
Medusa PAR	PAR	—	Navy	300, 600	P G ..	N	—	—	Germany
Meerkerk ¹ ..	OMR	200	Verenigde Nederlandsche Scheep- vaart	600 300, 450, 600	P G .. P G ..	X	0.40	4.00	Holland Holland

	FAGM	Navy	Company	Passes	PG	N	0.40	4.00	Country
Meg Megali Hellas ¹	200-250	Navy	Compagnie Nationale Hellénique de Navigation	300, 600	PG	N	0.40	4.00	Great Britain
Megantic ¹⁹	200	Oceanic S. N. Co., Ltd.	300, 600, 2,100, 2,200 C.W.	PG	PG	N	0.40	—	Great Britain
Megna ¹⁹	200	—	300, 600	PG	PG	X	0.40	—	United States of America
Mehalatos ¹⁰²	—	—	300, 600	PG	PG	N	—	—	France
Méhari	—	Navy	—	300, 800	PG	N	0.05	—	Japan
Meichi Maru ¹	200	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	0800 to 1100 1400 to 1700	0.40	—	Japan
Meidai Maru ¹	300	Yamaji Kisen Kaisha	300, 600	PG	PG	2000 to 2400	0.40	—	Japan
Meigle ⁴⁷	—	N.J.L.D. Coustal	300, 600	PG	PG	0800 to 1100 1400 to 1700	—	—	Newfoundland
Meigen Maru ¹	400	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	2000 to 2400	0.40	—	Japan
Meigs ¹³²	—	—	300, 600	PG	PG	N	—	—	United States of America
Meikai Maru ¹	200	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	0800 to 1100 1400 to 1700	0.40	—	Japan
Meiko Maru ¹	400	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	2000 to 2400	0.40	—	Japan
Meinam ¹	250	Compagnie des Messageries Mari- times, Paris	300, 600	PG	PG	— ²⁷	0.40	—	France
Meissonier GWZ ¹⁹	200	Lloyd Royal Belge, Antwerp	300, 600	PG	PG	N	0.40	4.00	Great Britain
Meissonier OSC ¹⁰	150-200	—	300, 600	PG	PG	X	0.40	—	Belgium
Meiten Maru ¹	400	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	0800 to 1100 1400 to 1700	0.40	—	Japan
Meitwu Maru ¹	400	Meiji Kaum Kabushiki Kaisha	300, 600	PG	PG	2000 to 2400	0.40	—	Japan
Meiyo Maru ¹	400	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	PG	PG	0800 to 1100 1400 to 1700	0.40	—	Japan
Meknassi	120	Ship belonging to the Morocco Customs Administration	300	O	O	N	—	—	Morocco
Melanier ¹⁹	240	Navy	—	300, 600	PG	X	0.40	—	Great Britain
Melbourne GABR	—	—	—	300, 600	PG	—	—	—	Australian Commonwealth
Melbourne VZBF ¹	300	—	—	300, 600	PG	—	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Melchior Treub ¹	200	Koninklijke Paketvaart Maat- schappij, Amsterdam	300, 600	PG	PG	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	4.00	Dutch East Indies
Melderskin ¹	300	(Armateur) Joh. Ludw. Mowinkel, Bergen	300, 600	PG	PG	X	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word	Minimumpertelegram.	
Melford Hall ¹⁹	GDVN	—	—	300, 600	P G	X	0.40	—	Great Britain
Meline ¹	LES	150-200	(Amateur) Tonsberg Thorvald Berg, Operated by James McKelvie, 59, Mark Lane, London.	300, 600	P G	X	0.40	4.00	Norway
Melisande ²¹	GFTW	—	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague	300, 450, 600	P G	X	0.40	—	Great Britain
Meliskerk ¹	PDAC	200	—	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Melita ¹⁹	BNB	270	—	300, 450, 600, 2,100, 2,200	P G	N	0.40	—	Great Britain
Mellifont ²¹	YWN	110	Lancashire and Yorkshire Railway Co.	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Mellum ¹	AMM	—	Navy	—	O	N	—	—	Germany
Melmore Head ¹⁹	XJC	150	—	300, 450, 600	P G	X	0.40	—	Great Britain
Melona ¹⁸	EZF	—	—	300, 600	P G	X	0.40	—	Great Britain
Melpo ¹	SVQ	150-200	A. A. Capparis, Athens	300, 600	P G	X	0.40	4.00	Greece
Melpomene ¹⁷	ICGN	140	—	300, 600	P G	X	0.40	—	Italy
Melrose GFCS ¹⁹	GFCS	100	New England Fuel and Transportation Co., 11, Devonshire St., Boston (Mass.)	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Melrose KZW ^{9 121}	KZW	300	—	300, 600	P G	X	0.40	—	United States of America
Melrose Abbey ¹⁹	XEO	—	—	300, 600	P G	X	0.40	—	Great Britain
Meltonian ¹⁹	ZGQ	170	—	300, 600	P G	N	0.40	—	Great Britain
Melusia ¹	CGT	240	—	300, 600	P G	N	0.40	—	Australian Commonwealth
Melville NKA ¹⁹	NKA	—	Navy	300, 600	P G	0700 to 0800 0930 to 1000 1200 to 1300 1400 to 1430 1630 to 1730 1900 to 2300 (ship's time)	0.20 ⁸ 0.40 ⁶	—	United States of America
Melville YSE ¹⁹	YSE	200	Dollar S.S. Lines, Ltd., 880, Hastings St., Vancouver, B.C.	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	Great Britain
Melville Dollar ²¹	VFE	200	—	300, 600	P G	—	0.40	—	Canada
Melvin ¹²⁹	NURC	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Mennon KDMH ²⁷	KDMH	300	—	300, 600, 1,300	P G	N	—	—	United States of America

Line	Ship	Company	Tonnage	Class	Speed	Days	Value	Port	Origin
1	Memphis	KD.VY	350	..	..	..	300, 600	Managers, Liverpool	United States of America
2	Memphis	NISS	300	..	..	..	300, 600	Marietta Mfg. Company	United States of America
3	Memphis	WYDJ	350	..	..	..	450, 600, 900, 1,100	—	United States of America
4	Memphis	KDTR	300	..	..	..	300, 450, 600	U.S. Steel Products Co., 30, Church Street, New York (N.Y.)	Holland
5	Menado	PGB	150	..	..	..	300, 450, 600, 800	Stoomvaart Maatschappij, Rotterdam	Great Britain
6	Menapian	XIT	200	..	..	..	300, 600	Lloyd Royal Belge, Antwerp	Belgium
7	Menapier	OPM	150-200	..	..	..	300, 600	—	Portugal
8	Mendes Barata	CUR	100-150	..	..	..	300, 600	(Armateur) Wilh. Wilhelmson, Christiania	Norway
9	Mendocino	LFP	250	..	..	..	300, 600	Société Générale des Transports Maritimes à Vapeur, Marseilles	France
10	Mendoza	FVQ	450	..	..	..	300, 600	—	—
11	Menévia	GRR	150	..	..	..	300, 600	London & North Western Railway Co.	Great Britain
12	Menévia	XEZ	200	..	..	..	300, 600	—	Great Britain
13	Menf	IPZ	140	..	..	..	300, 600	Sicilia, Società di Navigazione, Rione	Italy
14	Menhir	FON	200	..	..	..	—	(Armateur) Ch. et R. Dufihl Loriet	France
15	Menominee	KODL	150	..	..	..	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America
16	Menominee	MNE	250	..	..	..	300, 600	Compania Islena Maritima, Barcelona	Great Britain
17	Menorquin	EFQ	150	..	..	..	300, 600	Operated by A. Holt & Co., Managers, Liverpool	Spain
18	Mentor	YOA	—	..	..	..	300, 450, 600	Lloyd Triestino Società di Navigazione a Vapore, Trieste	Great Britain
19	Merano	IVS	140	..	..	..	300, 600	Ricardo Ortiz Arriano, Bilbao	Italy
20	Mercedes	TLN	200	..	..	..	300, 450, 600, 800	Van Nievelt, Goudrianen Co.'s Stoomvaart Maatschappij, Rotterdam	Spain
21	Merak	TZY	200	..	..	..	300, 450, 600, 800	Stoomvaart Maatschappij, Rotterdam	Holland
22	Merak	PGE	150	..	..	..	300, 450, 600, 800	Stoomvaart Maatschappij, Rotterdam	Holland
23	Mercedes	SRO	190	..	..	..	300, 600	Lloyd Brazileiro, Rio de Janeiro	Brazil
24	Mercedes	EJN	200	..	..	..	300, 600	—	Great Britain
25	Merced	KEFF	300	..	..	..	300, 450, 600	Alaska-Portland Packers' Assn., 1107, Yeon Building, Portland, Maine	United States of America
26	Merced	KIVG	—	..	..	..	300, 600	U.S. Shipping Board, Washington (D.C.)	United States of America
27	Merchant	EIG	155	..	..	..	300, 600	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Merchant Prince ¹⁰	ZFU	170	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Mercian ¹⁰	YVT	170	—	300, 600	P G	N	0.40	—	Great Britain
Mercier ¹⁴	ORFA	200	Lloyd Royal Belge, Antwerp	300, 450, 600, 800	P G	X	0.40	4.00	Belgium
Mercur ²⁵	DMQ	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Mercuria ¹⁰	YTM	150	—	300, 600	P G	N	0.40	—	Great Britain
Mercurio ¹	TKA	150	Hijos de J. Barreras, Vigo	300, 600	P G	N	0.30	3.00	Spain
Mercurius ²	TXF	150	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Mercy ⁹⁹	NKK	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meredith ⁹⁹	NETS	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Merganser ¹⁰	GCTL	—	General S.S. Corporation, 280, Battery St., San Francisco (Cal.)	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meriden ⁹ ¹²¹	KILP	200	—	300, 450, 600	P G	X	0.10 ⁸⁷ 0.40	1.00 ⁸⁷	Great Britain
Merion ¹⁰	MJM	—	Operated by A. Holt & Co., India Buildings, Water St., Liverpool	300, 600	P G	X	—	—	United States of America
Meriones ⁷¹	GBCK	250	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Meritt ⁹⁹	WXI	—	—	300, 600	P G	X	—	—	Great Britain
Merka ¹⁰	GBZD	225	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Merlin ¹⁰	GFED	150	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 450, 600	P G	X	0.40	—	Great Britain
Merope ¹	TWP	—	Unity Shipping & Trading Co., Ltd., Merthyr House, James St., Cardiff	300, 600	P G	X	—	—	Great Britain
Meropi ⁷¹	GDCQ	—	—	300, 600	P G	X	0.40	4.00	Holland
Merrimack ¹⁰³	KQM	150	Merchants and Miners Transportation Co., Light and German Street, Baltimore (Md.)	300, 450, 600	P G	N	0.40	—	United States of America
Merriva ²	VKB	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth

Maintainer	SIT	250	1,000	300, 600	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40 0.40 0.20 111 0.40 112	4.00	Sweden
Merton Hall ¹⁰	GBCW	—	—	300, 600	P	X	0.40	—	Great Britain
Mesaba ¹⁰	NUMJ	—	—	300, 600	P	N	0.40	—	United States of America
Mesina ¹⁰	EOV	—	—	300, 600	P	X	0.40	—	Great Britain
Mesina ¹⁰	LEV	150-200	—	300, 600	P	X	0.40	4.00	Norway
Mesopotamia ¹⁰	EVA	155	—	300, 600	P	X	0.40	—	Great Britain
Messina ¹⁰	DMA	200	—	300, 600	P	X	0.40	4.00	Germany
Meta ¹	SFM	150	—	300, 600	P	X	0.40	4.00	Sweden
Metagama ¹⁰	YZQ	240	—	300, 450, 600, 2,100, 2,200, 2,400	P	N	0.40	—	Great Britain
Metapan ⁹⁸	KLF	300	—	300, 600	P	N	0.20 111 0.40 112	—	United States of America
Meteor AMR ¹	AMR	200	—	—	O	N	—	—	Germany
Meteor AZM ¹	AZM	150	—	600, 900	P	X	0.15	—	Estonia
Meteor AQAN	AQAN	150	—	300, 450, 600	P	X	0.15	1.50	Norway
Meteor KDYJ ^{9 131}	KDYJ	150	—	300, 600	P	X	0.40	—	United States of America
Methven ¹¹	YLZ	175	—	300, 600	P	X	0.40	—	Great Britain
Meton	KDBM	—	—	300, 600	P	X	0.40	—	United States of America
Metz	FABM	—	—	600, 800	P	N	0.05	—	France
Meuse	FBQX	—	—	300, 800	P	N	0.05	—	France
Mevania ⁹⁷	KDCU	300	—	300, 600, 1,800	P	X	0.40	—	United States of America
Mexican ¹³⁴	WKL	300	—	300, 450, 600	P	N	0.20 111 0.40 112	—	United States of America
Mexican Lady ¹⁰	GJMQ	—	—	300, 450, 600	P	X	0.40	—	Great Britain
Mexicano KGM ^{9 131}	KGM	200	—	300, 600	P	X	0.40	—	United States of America
Mexicano LDH ¹	LDH	270-320	—	300, 600	P	X	0.40	4.00	Norway
Mexico FTX ¹	FTX	250	—	300, 600	P	N	0.40	—	France
Mexico KWX ¹⁰⁸	KWX	300	—	300, 450, 600	P	N	0.40	—	United States of America
Mexico MWG ¹⁰	MWG	170	—	300, 600	P	N	0.40	—	Great Britain
Mexico OGF ⁴⁰	OGF	350	—	300, 450, 600, 800	P	X	0.40	4.00	Denmark
Mexico XBB ¹	XBB	120	—	300, 600	P	X	0.40	—	Mexico
Mexico Maru ¹	JMX	400	—	300, 600	P	X	0.40	—	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Mexoil ¹²¹	..	—	Pan-American Petroleum and Transport Co., Incorp., 1015, Security Building, Los Angeles (Cal.)	300, 600	P G ..	X	0.40	—	United States of America
Meyer ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Meynell	..	—	Navy	—	P G ..	—	—	—	Great Britain
Meyun ⁷¹	..	—	Operated by the Perim Coal Co., Ltd., 6, Seaton Buildings, 17, Water St., Liverpool	300, 459, 600	P G ..	X	0.40	—	Great Britain
M. F. Elliott ^{9 121}	..	300	Standard Oil Company	—	P G ..	X	0.40	—	United States of America
M. Gamero	..	—	Navy	—	—	—	—	—	Chile
M. H. Kongshavn ¹	..	300	(Armateurs) A/S M. H. Kongshavn & Sønner, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Miami ^{9 121}	..	150	Peninsular and Occidental S.S. Co., Exchange Building, New Haven (Conn.)	300, 600	P G ..	N	0.40	—	United States of America
Miami GBFJ ¹⁹	..	—	A. Bistis, Andros	300, 600	P G ..	X	0.40	—	Great Britain
Michael ¹⁹	..	150-200	—	300, 600	P G ..	X	0.40	—	Great Britain
Michael Bistis ¹	..	150-200	—	300, 600	P G ..	X	0.40	4.00	Greece
Michael L. Embiricos ¹	..	150-200	S. G. Embiricos, Cardiff	300, 600	P G ..	X	0.40	4.00	Greece
Michaelston ¹⁹	..	145	—	300, 600	P G ..	X	0.40	—	Great Britain
Michel et Renée	..	200	Navy	300, 800	P G ..	N	—	—	France
Michel Mazella ¹	..	200	Mazella & Cie., 1, Place Sad-Carnot, Marseilles	300, 600	P G ..	X	0.05	—	France
Michigan FQQ ¹	..	300	Compagnie Générale Transatlantique, Paris	300, 600	P G ..	X	0.40	—	France
Michigan GBKF ¹⁹	..	220	Navy	300, 600	P G ..	N	0.40	—	Great Britain
Michigan NJZ ⁹⁹	..	—	—	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Middlebury ¹⁰⁹	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Middleham Castle ¹⁹	..	145	—	300, 600	P G ..	0600 to 0800 0900 to 1200	0.40	—	Great Britain

Ship	WRO	150	Coastwise Transportation Co., 40, Central St., Boston (Mass.) Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 450, 600	P G	X	0.40	United States of America
Middlesex WRO ¹²¹	WRO	150	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P	—	0.40	Canada
Midland King ²¹	CKI	150	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P	—	0.40	Canada
Midland Prince ²¹	CKJ	150	Mitsui Bussan Kaisha ..	300, 600	P G	..	0.40	Japan
Milnesan Maru ¹	JBI	400	Navy ..	600	O ²⁸	..	—	Holland
Mijnveger	PAX	—	Maatschappij Stoomschip, Mij- drecht, Rotterdam	300, 600	P G	..	0.40	Holland
Mijldrecht ..	PXE	100	Navy ..	—	O	..	—	Japan
Mikasa ¹ ..	JGC	—	Kokusai Kisen Kaisha ..	300, 600	P G	..	0.40	Japan
Milan Maru ¹	JMY	400	Societa Italiana di Servizi Marit- timi, Rome	300, 600	P G	..	0.40	Italy
Milano ¹⁷ ..	INM	140	Transoceanica Societa di Naviga- zione, Naples	300, 600	P G	..	0.40	Italy
Milazzo ¹⁷ ..	IEP	190	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	Great Britain
Millais ¹³ ..	LST	225	A, H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	P G	..	0.40	United States of America
Miller County ^{8 121}	KERX	300	—	300, 600	P G	..	0.40	Great Britain
Millgate ¹⁹	ZWA	—	—	300, 450, 600	P G	..	0.40	United States of America
Millinocket ¹⁰³	KNM	200	—	300, 600	P G	..	0.40	Great Britain
Millpool ¹⁹	LTI	150	—	300, 450, 600	P G	..	0.40	Great Britain
Miltown ¹⁹	GFXR	—	—	300, 600	P G	..	0.40	Great Britain
Milluna ³ ..	VKC	300	—	300, 600	P G	..	0.20 ⁸ 0.40 ⁶	Australian Commonwealth
Milon ..	FAWM	—	Navy ..	300, 800	P G	..	0.05	France
Milos ¹ ..	TGM	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G	..	0.40	Greece
Mitlades ¹⁹	THF	100-150	G. M. Emberticos, Athens	300, 600	P G	..	0.40	Greece
Milton ¹⁹	BBX	135	—	300, 600	P G	..	0.40	Great Britain
Miltonstar ¹⁹	YSC	160	Grand Trunk Car Ferry Line, Milwaukee (Wis.)	300, 450, 600	P G	..	0.40	Great Britain
Milwaukee KEXS ^{9 121}	KEXS	—	—	300, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Milwaukee NISM ¹⁰²	NISM	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Milwaukee Bridge ^{121 9}	KIBF	300	(Armateurs) Skibsaktieselskabet Maderas, Holen	300, 600	P G	..	0.40	United States of America
Mimer ¹ ..	TRQ	75-100	Compagnie des Messageries Mari- times, Paris	300, 600	P G	..	0.40	Norway
Mimi ²⁵ ..	DMM	200	—	300, 600	P G	..	0.40	Germany
Mimi Horn ²⁵	DMY	200	—	300, 450, 600	P G	..	0.40	Germany
Min UCR ¹	UCR	300	—	300, 450, 600	P G	..	0.40	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Mina Brea ²¹	YAP	150	International Petroleum Company, Toronto (Ont.)	300, 600	P	— 27	0.40	—	Canada
Minas Geræas SNM	SNM	450	Navy	600	O ¹⁶	—	0.40	—	Brazil
Minas Geræas SRB ¹⁸	SRB	240	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Min GFDV ⁷¹	GFDV	250	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Mincio ¹⁷	UTA	190	Navigazione Generale Italiana, Genoa	300, 600	P G	X	0.40	—	Italy
Minden ³⁸	DMI	200	—	300, 600	P G	X	0.40	4.00	Germany
Minderoo ⁷¹	GFZP	400	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	P G	N	0.40 ⁸¹	—	Great Britain
Mindini ²	VJY	240	—	300, 600	P G	1000 to 1100 1200 to 1300 1400 to 1450 1630 to 1730 1900 to 2030 2030 to 0200 (ship's time)	0.20 ⁸ 0.40 ⁶	—	Australian Commonwealth
Mindoro	KDRS	—	Philippine Insular Government	300, 600	O ³	X	—	—	United States of America
Minekran V ¹	OWO	—	Navy	600	—	—	—	—	Denmark
Minekran VI ¹	OWP	—	Grace S.S. Company, Incorp., 7, Hanover Square, New York (N.Y.)	600	O ³	X	—	—	Denmark
Mineola ^{9 m}	KSEE	150	—	300, 450, 600	P G	X	0.40	—	United States of America
Minerva IXJ ¹⁷	IXJ	140	Società Navigazione Ligure di Armamento, Genoa	300, 600	P G	X	0.40	—	Italy
Minerva TXG ¹	TXG	150	Koninklijke Nederland, Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Minerie ¹⁹	LSC	150	—	300, 600	P G	X	0.40	—	Great Britain
Mingrelie ¹	FPX	200	Compagnie de Navigation Paquet, Marseilles	300, 600	P G	X	0.40	—	France
Minho ⁶¹	CUM	100-150	—	300, 600	P G	X	0.40	—	Portugal
Ministro Escurre ¹	LMZ	—	Navy	450, 600	O	N	—	—	Argentine Republic
Minna Horn ³⁵	DMH	200	—	300, 600	P G	X	0.40	—	Germany
Minneapolis ¹⁰	NGP	—	—	—	—	—	—	—	—

Minnedosa ¹⁹	GZX	180	Atlantic Transportation Company, 9, Broadway, New York	U.S. Shipping Board, Washington (D.C.)	2,100, 2,200 300, 450 600, 1,800	P G	N	United States of America
Minnekahda ¹⁰³	KDKK	200- 1000	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Minnequa ¹⁰³	KIVB	300	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Minnesota NKD ⁹⁹	NKD	—	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Minnesota WEK ¹⁰³	WEK	150	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Minnesota WMI ¹⁰³	WMI	150	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	United States of America
Minnesota WKM	WKM	300	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Minnesota KOPG	KOPG	300	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Minnewawa ^{9 131}	MLA	170	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Minnie de Larrinaga ¹⁰	—	—	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Minooka ^{9 131}	KOZN	300	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	United States of America
Minto ²	VUM	200	Royal Indian Marine (Armateurs) Det Bergenske Damp-	Royal Indian Marine (Armateurs) Det Bergenske Damp-	600	O	X	India
Mira ¹	LFJ	120	Royal Indian Marine (Armateurs) Det Bergenske Damp-	Royal Indian Marine (Armateurs) Det Bergenske Damp-	300, 450, 600	P G	X	Norway
Mirabello	IFD	—	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	Italy
Mirach ¹	PXI	200	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	Holland
Miramar	CDY	—	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	—	Chile
Miranda ¹	SJL	250	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P	—	Sweden
Mirentxu ¹	HNB	100	Federico Power, Bilbao	Federico Power, Bilbao	300, 600	P G	N	Spain
Mirita ¹	LHQ	150-200	(Armateurs) det Selmerske Rederi, Trondhjem	(Armateurs) det Selmerske Rederi, Trondhjem	300, 600	P G	X	Norway
Miriam ¹	LCG	150	(Armateurs) det Selmerske Rederi, Trondhjem	(Armateurs) det Selmerske Rederi, Trondhjem	300, 450, 600	P G	X	Norway
Mirlo ¹	AWM	300-600	(Armateur) Wilh. Wilhelmsen, Christiania	(Armateur) Wilh. Wilhelmsen, Christiania	300, 450, 600, 800	P G	X	Norway
Mirzapore ¹⁹	GFBK	—	Navy Yusen Kaisha (Japanese Mail Steamship Company)	Navy Yusen Kaisha (Japanese Mail Steamship Company)	300, 600	P G	N	Great Britain
Mishima ¹	JUL	—	Navy Yusen Kaisha (Japanese Mail Steamship Company)	Navy Yusen Kaisha (Japanese Mail Steamship Company)	300, 600	O	—	Japan
Mishima Maru ¹	JMQ	450	Navy Yusen Kaisha (Japanese Mail Steamship Company)	Navy Yusen Kaisha (Japanese Mail Steamship Company)	300, 600	P G	N	Argentina Republic
Misiones ¹	LLJ	—	Navy Yusen Kaisha (Japanese Mail Steamship Company)	Navy Yusen Kaisha (Japanese Mail Steamship Company)	300, 450	O	—	Argentina Republic
Miskianza ^{9 131}	KOZM	300	U.S. Shipping Board, Washington (D.C.)	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	United States of America
Mississippi ¹	FGI	160	Compagnie Générale Transatlan- tique, Paris	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	X	France
Mississippi GRI ¹⁹	GRI	200	Compagnie Générale Transatlan- tique, Paris	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	X	Great Britain
Mississippi NKE ⁹⁹	NKE	—	Compagnie Générale Transatlan- tique, Paris	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	N	United States of America
Missoula ⁹⁹	NKM	—	Compagnie Générale Transatlan- tique, Paris	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	N	United States of America
Missouri FXU ¹	FXU	200	Compagnie Générale Transatlan- tique, Paris	Compagnie Générale Transatlan- tique, Paris	300, 600	P G	X	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiogram.	
Missouri ¹⁹ M.L.G.	MLG	140	Michigan Transportation Co.	300, 600	P G	X	0.40	—	Great Britain
Missouri W.F.X.	WFX	150	American Hawaiian S.S. Company,	300, 600	P G	N	0.20	—	United States of America
Missourian ¹⁸⁴	KFAA	—	8, Bridge St., New York (N.Y.)	—	P G	X	0.40	—	United States of America
Mistley	GFEK	—	Navy	—	P G	—	—	—	Great Britain
Mistral	FBML	—	Navy	300, 800	P G	N	0.05	—	France
Misurata	IGP	—	U.S. Shipping Board, Washington	—	P G	X	—	—	United States of America
Mitchell ¹⁸¹	KOTF	—	(D.C.)	300, 600	P G	—	0.40	—	United States of America
Mito Maru ¹	JMV	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Mitsuki Maru ¹	JDB	400	Itaya Shosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Mitra ¹⁹	MZH	210	Mitsubishi Shoji Kaisha	300, 600	P G	X	0.40	—	Great Britain
Miyaura Maru ¹	JARA	200	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Mye Maru ¹	JNI	400	Teikoku Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Mizar ¹	HDA	150	Van Nievelt Goudriaan en Co.'s	300, 450, 600, 800	P G	X	0.40	4.00	Holland
M. Jarpa	CBM	—	Stoomvaart Maatschappij, Rotterdam	—	P G	—	—	—	Chile
Mjörn ¹	SJC	100	Navy	300, 600	P	—	—	—	Sweden
			Rederiaktiebolaget Transatlantic, Gottenburg	—	—	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.28	2.80	—
M. J. Scanlon ⁸⁷	WJAO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	—	—	United States of America
M. M. Davis ²	KDAG	140	C. E. Davis Packing Company, Fleeton (Va.)	300, 450, 600	P R	X	—	—	United States of America
Moana ⁷¹	GFYC	325	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	—	—	Great Britain

Mobile City ^{9 121}	KDCE	300	U.S. Steel Products Company, 30, Church St., New York (N.Y.)	300, 450, 600	P G	^	0.40	4.00	Portugal
Mocambique ⁶¹	CSM	100-150	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	P G	N	0.40	4.00	Norway
Mod ¹⁰	AQM	200-250	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Modasa ¹⁰	GFDZ	—	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	O ³⁸	X	0.40	4.00	Norway
Mode ²²	SBY	100-125	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	P G	X	0.40	4.00	Norway
Modeni ²³	ATN	150-200	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	P G	X	0.40	4.00	Norway
Modesta ²³	TTS	150-200	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	P G	X	0.40	4.00	Norway
Modica	TQS	150-200	(Armateur) A/S Ivarans Rederi, Christiania	300, 600	P G	X	0.40	4.00	Norway
Modig ¹	TQX	100-150	(Armateur) A/S Ivarans Rederi, Canada S.S. Lines, Ltd., Montreal	300, 600	P G	X	0.40	4.00	Canada
Modjeska ²¹	CHU	250	(P.Q.)	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Modjokerto ¹	OLI	200	Stoomvaart Maatschappij Rotterdam daneische Lloyd, Rotterdam	300, 600	P G	N	—	—	United States of America
Modoc ¹²⁸	NIVD	—	(Armateur) Ivar An Christensen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Modum ¹	TST	150-200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Moena ¹	TWK	200	Amalgamated Wireless (Australia) Ltd.	300, 600	P G	X	0.20	—	Great Britain
Moeraki ⁷¹	GFYD	325	Nederlandsche Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Moerdijk ¹	TVJ	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Moffitt ^{9 121}	KDME	—	Navy	—	O	—	—	—	Japan
Mogami ¹	JWD	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Mogileff ¹⁹	XKL	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Mohave NTO ⁹⁹	NTO	—	Clyde S.S. Co., Pier 36, North River, New York	300, 450, 600	P G	N	0.40	—	United States of America
Mohawk KVM ¹⁰³	KVM	300	New England S.S. Co., Fall River (Mass.)	300, 450, 600	P G	N	0.40 ^{111 117}	—	United States of America
Mohawk KXE	KXE	100	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Mohawk NUFB ⁹⁹	NUFB	—	New England S.S. Co., Fall River, New York	300, 450, 530, 600	P G	X	0.40	—	United States of America
Mohegan ¹⁰³	KXM	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Mohinkis ¹⁰⁸	KUKP	300	—	300, 600	P G	X	0.40	—	Australian Commonwealth
Moira ¹	VXL	300	—	300, 600	P G	X	0.20 ⁸ 0.40 ⁵	—	—
Moise ^{18 1}	FGS	200	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.10	—	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wave-lengths in Metres (the Normal Wave-length in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per-Word.	Minimum per Radio-telegram.	
Montana NISJ ¹⁰²	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G ..	N	—	—	United States of America
Montauban ¹	..	200	Atlantic Transport Company, 9, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	France
Montauk KIXV ¹⁴³	..	—	Navy	300, 450, 600	P G ..	X	0.20	—	United States of America
Montank	300	..	300, 450, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Montazah ¹⁹	..	—	Navy	300, 600	P G ..	X	0.40 ¹¹²	—	United States of America
Montcalm FAHM	..	—	..	300, 800	P G ..	N	0.40	—	Great Britain
Montcalm GFTJ ¹⁹	..	—	..	300, 450, 600,	P G ..	N	0.05	—	Great Britain
..	..	—	..	2,100, 2,200,	P G ..	N	0.40	—	Great Britain
..	..	—	..	2,400	P G ..	N	0.20 ¹¹¹	—	United States of America
Montcalm NEQF	..	—	Navy	300	P G ..	N	0.40 ¹¹⁹	—	Canada
Montcalm VDJ ²	..	150	Govt. Station (Dept. Marine and Fisheries), Ottawa (Ont.)	300, 600, 800	O ..	X	—	—	France
Mont Cenis ¹	..	200	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.40	—	France
Mont Cervin ¹	..	200	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.40	—	United States of America
Montclair ¹⁸³	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	Great Britain
Montclare ¹⁹	..	—	..	300, 450, 600,	P G ..	N	0.40	—	Canada
..	..	—	..	2,100, 2,200,	P G ..	N	0.40	—	United States of America
..	..	—	..	2,400	P G ..	N	0.40	—	Canada
Monteagle ²¹	..	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600, 800	P G ..	X	0.40	—	United States of America
Montebello ² ¹¹¹	..	300	Union Oil Company	300, 600	P G ..	X	0.40	—	Spain
Montecillo (EL) ² , ¹¹	..	250	Compañia General de Navegacion, Bilbao	300, 600	P G ..	N	3.00	—	Italy
Montecristo	—	Navy	300, 600	P G ..	—	—	—	Italy
Montecristo IVJ ¹⁷	..	190	Lloyd Sabaudo Società Anonima per Azioni, Genoa	300, 600	P G ..	X	0.40	—	Italy
Monte Grappa IEB ¹⁷	..	140	Lloyd Adriatico Società di Navigazione, Venice	300, 600	P G ..	X	0.40	—	Italy
Monte Grappa IVP ¹⁷	..	140	Navigazione Libera Triestina, Trieste	300, 600	P G ..	X	0.40	—	Italy
Montello ¹⁷	..	140	Lloyd Adriatico Società di Navigazione, Venice	300, 600	P G ..	X	0.40	—	Italy

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Montemar	CLZ	—	Soc. Nac. de Buque y Maderas, Calle Prat 237, Valparaiso	—	—	Chile
Montenegro IMM ¹⁷	IMM	140	Societa Italiana di Servizi Marittima, Rome	300, 600	P G	—
Montenero ¹⁷	UPY	140	Armatori Runiti, Societa di Navigazione, Genoa	300, 600	P G	0.40
Monte Nevoso ¹⁷	IVH	140	Lloyd Adriatico Societa di Navigazione, Venice	300, 600	P G	0.40
Monte Pasubio ¹⁷	ICCC	140	Armatori Runiti, Societa di Navigazione, Genoa	300, 600	P G	0.40
Monterey KVV ¹⁰⁸	KVV	300	Armatori Runiti, Societa di Navigazione, Genoa	300, 450, 600	P G	0.40
Monterey NKN ¹⁹	NKN	—	New York and Cuba Mail S.S. Co. Navy	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²
Monte Santo ¹⁷	UQJ	140	Lloyd Adriatico Societa di Navigazione, Venice	300, 600	P G	0.40
Monte Toro ²	EFT	150	Compagnia Islena Marittima, Barcelona	300, 600	P G	3.00
Montevideo CWE	CWE	220	Navy	450, 600	O	—
Montevideo EDV ¹	EDV	270	Compania Transatlantica, Barcelona	300, 600	P G	0.30
Montezuma ²⁹	XKY	150	Independent S.S. Co., Foot Orleans Street, Boston	300, 600	P G	0.40
Montfaucon	KUQZ	—	Koninklijke Hollandsche Lloyd, Amsterdam	300, 600	P G	0.10 ¹¹⁸
Monterland ¹	PZW	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montgomery KIJP ^{2 131}	KIJP	300	U.S. Steel Products Company, 30, Church St., New York	300, 450, 600	P G	—
Montgomery NAXJ ¹⁹	NAXJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montgomery City ^{2 131}	KDJZ	300	Societe des Ateries de Paris et d'Outreau, Paris	300, 600	P G	0.20
Montgomeryshire ¹⁹	GBV	—	Societe Generale des Transports Maritimes a Vapeur, Marseille	300, 600	P G	0.40
Monticello ¹³¹	WLJ	100	Joly, Duhamel & Vasse Fecamp	300, 600	P G	0.40
Montjoie ¹	FDQ	200	Transports Maritimes de l'Etat	300, 800	P G	0.40
Mont Kemmel UFF ¹	UFF	200	Navy	300, 600	P G	0.05
Mont Kemmel UFF ¹	UFF	200	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	P G	0.40 ⁹¹
Mont Kemmel UFF ¹	UHF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.20 ⁸ 0.40 ⁸
Mont Magny ¹	HSV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montmirail	FBMI	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montoro GDJC ²¹	GDJC	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montoro VHT ^{1 21}	VHT	240	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40
Montpelier ¹³⁴	WLKZ	300	Societe Generale des Transports Maritimes a Vapeur, Marseilles	300, 600	P G	0.40
Mont-Pelvoux ¹	FUX	200	Transports Maritimes de l'Etat	300, 600	P G	0.40
Montreal GBKN ¹⁹	GBKN	—	Transports Maritimes de l'Etat	300, 600	P G	0.40
Montreal HSX ¹	HSX	250	Transports Maritimes de l'Etat	300, 600	P G	0.40
Montreal ²¹	VCW	100	Transports Maritimes de l'Etat	300, 600	P G	0.40

	VZBR	400	—	300, 450, 600	P G ..	N	0.20 ^s 0.40 ^a — 0.40	Australian Commonwealth United States of America Sweden Australian Commonwealth
Morgan-Lewis Moria ¹	WXQ SMP	200 150	—	300, 600, 1,100 300, 600	O .. P ..	X ..	0.60 to 0700 1100 to 1200 1400 to 1500 1800 to 1900 0700 to 0800 0930 to 1000 1200 to 1300 1400 to 1430 1630 to 1730 1900 to 2300 (ship's time)	
Morinda ¹	VJF	240	—	300, 600	P G ..	..	0.20 ^s 0.40 ^a	
Morinier ¹³ Morioka Maru ¹	YHG JOK	120 400	—	300, 600 300, 600	P G .. P G ..	..	0.40 0.40	Great Britain Japan
Mormugao ⁶¹ Morocco ¹⁹	CUH ZVV	100-150 210	—	300, 600 300, 600	P G .. P G ..	..	0.40 0.40	Portugal Great Britain
Morrill ²	NRC	100	—	300, 600	P G ..	..	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Morris ⁹⁸	NWS	—	..	300, 600	P G ..	..	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Morristown ⁹ 121	WGAI	300	..	300, 450, 600	P G ..	..	0.40	United States of America
Morro Castle ¹⁰³	KWC	300	..	300, 600	P G ..	..	0.40	United States of America
Mortier ¹³ Mortlake ¹³ Mordale ¹³	FBNM YNE MUP	— 145 230	..	300, 800 300, 600 300, 600, 2,100, 2,200 C.V.	P G .. P G .. P G ..	..	0.05 0.40 0.40	France Great Britain Great Britain
Mosella FSD ¹	FSD	300	..	300, 600	P G ..	..	0.40	France
Mosella KDCQ ⁹⁷	KDCQ	300	..	300, 600, 1,800	P G ..	..	0.40	United States of America
Moshico ⁹ 121	KOBX	300	..	300, 600	P G ..	..	0.40	United States of America
Moskov ⁴⁰	OGM	200	..	300, 450, 600, 800	P G ..	..	0.40	Denmark
Mossamedes ⁶¹ Moski ¹	CSE FBP	100-150 300	..	300, 600 300, 450, 600	P G .. P G ..	..	0.40 0.40	Portugal France
Mossoir ⁶ 2	PPN	200	..	300, 500, 600	P G ..	..	0.40	Brazil
Mostyn ⁷¹ Motagua ¹⁶	GDWY MPN	100 230	..	300, 450, 600 300, 600	P G .. P G ..	..	0.40 0.40	Great Britain Great Britain
Moth ¹³ Moto ¹⁹ Motrico ¹	GFOI GBDS EEY	— — 200	..	— 300, 600 300, 600	P G .. P G .. P G ..	..	— 1.00 ⁸⁷ 0.30	Great Britain Great Britain Spain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Mottisfont ¹⁹	..	170	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Mouette (La) ¹	..	250	Fourmentin, Avise et Cie., Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Moulton	—	Navy	300, 800	P G ..	N	0.05	—	France
Moulouya ¹¹	..	160	Compagnie de Navigation Mixte à Vapeur, Marseilles	300, 600	P G ..	X	0.10	—	France
Mount Baker ⁹ ¹²¹	..	300	Frank B. Peterson	300, 600	P G ..	X	0.40	—	United States of America
Mount Berwyn ¹⁹	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Mount Carroll ¹²⁴	..	300	Shawmut S.S. Co., 60, Federal St., Boston (Mass.)	300, 450, 600	P G ..	N	0.40 ¹¹²	—	United States of America
Mount Clay ¹²⁴	..	300	American Ship and Commerce Navigation Corporation	300, 450, 600,	P G ..	N	0.40	—	United States of America
Mount Clinton ¹²⁴	..	300	Shawmut S.S. Co., 60, Federal St., Boston (Mass.)	300, 450, 600,	P G ..	N	0.40	—	United States of America
Mount Etna ¹⁹	..	155	—	300, 600	P G ..	X	0.40	—	Great Britain
Mount Evans ¹⁷	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Mount Everest ¹⁹	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Mount Hope ¹	..	150	Providence Fall River and Newport Steamboat Co.	300, 600	P G ..	X	0.40	—	United States of America
Mountpark ¹⁹	..	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Mount Shasta ⁹ ¹²¹	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Mount Vernon	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Mount Vernon Bridge ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Mourine ¹³	..	—	—	300, 600	P G ..	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	Great Britain
Mouro ¹	..	180	Vasco Cantabrica de Navegacion, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Mowe ¹	..	100	—	300, 600	P G ..	X	0.40	4.00	Germany

M. S. Dollar ²¹	..	VGCM	250	ping Co., Ltd., Larne Harbour Co. Antrim, Ireland	300, 600, 800	P G ..	N	0.40	Canada
Muansa ²⁵	..	DMS	200	Canadian Robert Dollar Company, Ltd., Vancouver (B.C.)	300, 600	P G ..	X	0.40	Germany
Mueury ²	..	PPO	200	Companhia Commercio e Nave- gação, Rio de Janeiro	300, 500, 600	P G ..	N	0.40	Brazil
Mugford ⁹⁹	..	NEXR	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Muggia	..	IKU	—	Navy	—	P G ..	—	—	Italy
Mulbera ¹⁹	..	GFTM	—	Navy	300, 450, 600	P G ..	X	0.40	Great Britain
Mulhouse	..	FAXC	—	Navy	600, 800	P G ..	N	0.05	France
Mullany ⁹⁹	..	NUML	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹	United States of America
Mulpua ⁹⁷	..	KIDJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Multinomeh ²	..	WJIA	—	Multinomeh S.S. Company	300, 450, 600	P G ..	X	0.40	United States of America
Munabres ^{9 131}	..	WJN	300	Munabres S.S. Lines, Incorp., 82-92, Beaver St., New York	300, 450, 600	P G ..	X	0.40	United States of America
Munabro ^{9 131}	..	KUX	300	Munabro S.S. Corp.	300, 450, 600	P G ..	X	0.40	United States of America
Munamar ^{9 131}	..	KUI	200	Munamar S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 450, 600	P G ..	N	0.40	United States of America
Munardan ¹⁹	..	GQP	180	Munardan S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 600	P G ..	X	0.40	Great Britain
Munargo	..	KDWH	—	Munargo S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 450, 600	P G ..	N	—	United States of America
Munchester Castle ¹⁹	..	ZAX	160	—	300, 600	P G ..	—	6.40	Great Britain
Mundale ^{9 131}	..	KUJ	200	Mundale S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 600	P G ..	X	0.40	United States of America
Mundelta ^{9 131}	..	KUF	300	Mundelta S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 450, 600	P ..	X	0.40	United States of America
Mundo (El) ²	..	KKU	200	Mundo S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 600	P G ..	X	0.40	United States of America
Mundra ¹⁹	..	GDMT	—	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 600	P G ..	X	0.40	Great Britain
Mueric ¹⁹	..	XIL	180	—	300, 600	P G ..	X	0.40	Great Britain
Munin	..	SCF	—	Navy	—	O ³⁹	—	—	Sweden
Munindies ^{9 131}	..	KVE	300	Munindies S.S. Lines, Incorp., 82-92, Beaver St., New York (N.Y.)	300, 450, 600	P G ..	X	0.40	United States of America
Munisla ^{9 131}	..	KJO	200	Munisla S.S. Corporation, 82, Beaver St., New York	300, 600	P G ..	X	0.40	United States of America
Munplace ^{9 131}	..	KUG	200	Munplace S.S. Lines, Incorp., 82-92, Beaver St., New York	300, 450, 600	P G ..	X	0.40	United States of America
Munrio ^{9 131}	..	KVD	200	Munrio S.S. Lines, Incorp., 82-92, Beaver St., New York	300, 450, 600	P G ..	X	0.40	United States of America
Munsomo ^{9 131}	..	KUK	150	Munsomo S.S. Lines, Incorp., 82-92, Beaver St., New York	300, 450, 600	P G ..	X	0.40	United States of America
Munster ¹⁹	..	MCQ	170	—	300, 600	P G ..	N	0.10 ⁸⁷	Great Britain
Munsterland ³⁶	..	DMD	200	—	300, 450, 600, 800	P G ..	X	0.40	Germany
Muratha	..	HGG	—	Navy	300, 600	O ..	N	—	Siam
Murex ¹⁹	..	GFLS	—	—	300, 450, 600	P G ..	X	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Muriel ¹⁹	..	—	Muriel Motorship Corporation	300, 600	P G	X	—	—	United States of America
Murillo ¹⁹	..	220	—	300, 600	P G	N	0.40	—	Great Britain
Murison ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Murla ³⁵	..	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	X	0.40	4.00	Germany
Muroran Maru ¹	..	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Murray ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Mursa	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Musashi ¹	..	—	Navy	—	O	—	—	—	Japan
Musashi Maru ¹	..	150	Kyodo Gyogyo Kaisha	300, 600	P ³³	X	—	—	Japan
Muscantine ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Muscatian ¹⁹	..	170	Muskegon S.S. Corporation	300, 600	P G	EX ¹	0.40	—	Great Britain
Muskogee ⁹⁷	..	300	Standard Oil Co. of N.J., 26, Broadway, New York	300, 600	P G	X	0.40	—	United States of America
Muskogee ⁹ 131	..	300	Compagnie de Navigation Mixte à Vapeur, Marseilles	300, 450, 600	P G	X	0.40	—	United States of America
Mustapha II ¹⁶⁸ 1	..	200	—	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.10	—	France
Mutine	..	—	Navy	—	P G	—	—	—	Great Britain
Mutlach ¹⁷	..	140	Latina, Società di Navigazione, Rome	300, 600	P G	—	0.40	—	Italy
Mutsu ¹	..	—	Navy	—	O	—	—	—	Japan
Mykali ¹	..	100-150	The Hellenic Co. of Maritime Enterprises, Piræus	300, 600	P G	N	0.40	4.00	Greece
Myogisan Maru ¹	..	200	Mitsui Bussan Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Myriam ¹	..	300	Compagnie Auxiliaire de Navigation, 5, Avenue du Coq, Paris	300, 450, 600	P G	X	0.40	—	France
Myrmidon ²¹	..	—	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Myrsell	..	—	—	300, 600	P G	X	0.40	—	Great Britain

Ship	Call	Freq	Agency	Power	Class	Notes	Country
Myshavy Mystic 134	KHZ	300	Shawmut S. S. Company, Federal St. (Mass.)	300, 600	P G		United States of America
Mytilus 19	ZKU	200		300, 600	P G		Great Britain
N. 1. 99	NZE	—	Navy	300, 600	P G		United States of America
N. 2. 99	NZE	—	Navy	300, 600	P G		United States of America
N. 3. 99	NZG	—	Navy	300, 600	P G		United States of America
N. 4. 99	NZH	—	Navy	300, 600	P G		United States of America
N. 5. 99	NZI	—	Navy	300, 600	P G		United States of America
N. 6. 99	NZJ	—	Navy	300, 600	P G		United States of America
N. 7. 99	NZK	—	Navy	300, 600	P G		United States of America
Naaldwijk 1	TYN	150	Maatschappij Stoomschip Rand- wijk Rotterdam (Direction Erhardt en Dekkers, Rot- terdam)	300, 450, 600, 800	P G		Holland
Nacata 97	KDMM	300	U. S. Shipping Board, Washington (D. C.)	300, 600, 1, 800	P G		United States of America
Nacoochee 9 131	KFP	300	Ocean S. S. Co. of Savannah, Pier 35, North River, New York	300, 450, 600	P G		United States of America
Naderi 15	VUK	80	Bombay and Persia Steam Naviga- tion Co., Ltd.	300, 600	P G		India
Negano Maru 1	JCI	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G		Japan
Nagara LTZ	LTZ	200	Navy	300, 600	P G		Great Britain
Nagato JLS 1	JLS	—	Navy	—	O		Japan
Nagato 1	JGL	—	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G		Japan
Nagato Maru 1	JFY	400		300, 600	P G		Japan
Nagina 19	GFSK	—		300, 450, 600	P G		Great Britain
Nagoya 15	GCD	220		300, 450, 600, 2,100, 2,200, 2,400	P G		Great Britain
Nagore 19	GDBW	—		300, 600	P G		Great Britain
Nalaisea 3	GFEN	100		300, 600	P G		Great Britain
Nairana 3	VHP	—		300, 600	P G		Australian Commonwealth
Nairung 15	VUN	—	Bombay and Persia Steam Naviga- tion Co., Ltd. (Agents, Turner, Morrison & Co., Ltd., Bombay)	300, 600	P G		India
Naiwa 9 131	WCIU	300	U. S. Shipping Board, Washington (D. C.)	300, 450, 600	P G		United States of America
Najade 35	DNJ	60	Navy	300, 600	P G		Germany
Najaden 1	OVN	—		600	O 3		Denmark
Naka 1	ILY	—	Navy	—	O		Japan
Nakoso 1	TWE	—	Navy	—	O		Japan
Naldera 15	GCTZ	140		300, 600, 2,100, 2,200	P G		Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Meters (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Nalgora ¹⁰	GFTS	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Namasket	KDMI	500	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Nameaug ¹⁰⁸	KITN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Namsang ¹⁰	YVJ	170	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Nanchang ⁷¹	GDYR	100	Operated by the China Navigation Co., Ltd., 8, Billiter Square, London	300, 450, 600	P G ..	X	0.40	—	Great Britain
Nancy	FBNA	—	Navy	300, 800	P G ..	N	0.05	—	France
Nancy Weems ⁸⁷	WVAI	200	Baltimore & Carolina S.S. Company	300, 600	P G ..	X	0.40	—	United States of America
Nanerie ¹⁰	GBKQ	190	—	300, 600	P G ..	N	0.40	—	Great Britain
Nankai Maru ¹	JYF	400	Meiji Kaun Kabushiki Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Nankin ¹⁰	GBKM	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Nanking ^{9 111}	KKEE	300	China Mail S.S. Co., Sacramento and Montgomery Sts., San Francisco (Cal.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Nanking Maru ¹	JCG	200	Osaka Shosen Kaisha (Japan Mail Steamship Company)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Nan-Shen	XNS	—	Navy	—	O ..	—	—	—	China
Nansemond ¹⁰³	WQR	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Nanshan ¹⁰	NNK	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Nantahala ¹⁰³	WGIE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Nantasket ¹⁰³	WLIO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Nantes ¹	FRX	—	Société Maritime Auxiliaire de Transports, Nantes	—	P G ..	N	0.40	—	France
Nantucket KQN ¹⁰⁰	KQN	150	Merchants & Miners Transportation Co.	300, 450, 600	P G ..	N	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service formed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Nauplion ¹	100-150	The Hellenic Company of Maritime Enterprises, Piræus	300, 600	P G ..	X	0.40	4.00	Greece
Nauticaa ¹	300	Compagnie Auxiliaire de Navigation, 5, Avenue du Cof, Paris	300, 450, 600, 800	P G ..	X	0.40	—	France
Nautilus	—	Navy	300, 600	O	—	—	—	Spain
Naraboe ¹⁹	200	.. ..	300, 600	P G ..	—	0.40	—	Great Britain
Naraboe ¹⁹	—	300, 600	P G ..	N	0.20 ¹¹¹	—	United States of America
Naraboe ¹⁹	—	300, 600	P G ..	—	0.40 ¹¹²	—	Greece
Navarchoes Koyndouriotis ¹	150-200	The Chios Steamship Co., Ltd., Athens	300, 600	P G ..	X	0.40	4.00	Greece
Navarino ¹⁹	140	.. ..	300, 600	P G ..	X	0.40	—	Great Britain
Navarra EDY ¹	100	Compania de Navigaceon, Mmdaca	300, 600	P G ..	N	0.30	3.00	Spain
Navarra EEX ¹	100	Compania Transmediterranea, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Navarra TTP ¹	150-200	(Armateur) Fearnley & Eger, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Navarre ¹	250	Compagnie Générale Transatlantique, Paris	300, 600	P G ..	— ²⁷	0.40	—	France
Navasota ¹⁹	150	Government, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Navesink ²	100	.. ..	300, 600, 800	O	X	—	—	Great Britain
Navigator ¹⁹	180	Trafikaktiebolaget Grangesburg-Oxelösund, Stockholm	300, 600	P G ..	X	0.40	—	Greece
Narvik ¹	150	.. ..	300, 600	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	Sweden
Navia ²¹	250	Amalgamated Wireless (Australia), Ltd.	300, 600	P G ..	X	0.40 ⁹¹	—	Great Britain
Navy Office	—	Navy	600	O	—	—	—	Australian Commonwealth
Nawab ¹⁹	170	.. ..	300, 600	P G ..	X	0.40	—	Great Britain
Nawitka ^{9 151}	200	Nacirena Steamship Corporation, 25, Broad St., New York	300, 600	P G ..	X	0.20	—	United States of America
Naxos	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G ..	X	0.40	4.00	Greece
Nea Ellas ¹	100-150	J. D. Grocodilos, Piræus	300, 600	P G ..	X	0.40	—	Greece
Neapel ²⁵	200	.. ..	300, 600	P G ..	X	0.40	4.00	Germany
Neapolis ²	200	Royal Indian Marine	600	O ⁶	X	0.40 ³⁸	—	India
Neath Abbey ²¹	100	Simons Bros. & Co. Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G ..	X	0.40	—	Great Britain

Nebraska GBOZ ¹⁹	GBQZ	300	American-Hawaiian Steamship Co., 8, Bridge St., New York (N.Y.)	300, 600	P G	N	0.40	Great Britain
Nebraskan ¹²⁴	KXT	—	Navy	300, 450, 600	P G	X	0.40	United States of America
Nebraska NMA ⁸⁹	NMA	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Neches ⁸⁹	NIFP	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Nedeva II	KDTL	—	J. F. Lowcock	300, 600	—	X	—	United States of America
Neebing ¹⁹	ODH	120	—	300, 600	P G	X	0.40	Great Britain
Needwood ¹⁹	EOZ	125	Harada Kisen Kaisha	300, 600	P G	X	0.15 ⁸²	Great Britain
Neisai Maru ¹	JND	400	—	300, 600	P G	—	0.40	Japan
Neko ¹⁹	BOQ	180	Compagnia Italiana Navigazione e Commercio d'Oltremare, Rome (C.I.N.C.O.)	300, 600	P G	X	1.50 ⁸²	Great Britain
Nelda UTO ¹⁷	UTO	190	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	X	0.40	Italy
Nelus ⁷¹	ZKL	—	Joseph Lasry (Armateur), 14, Avenue de l'Opera, Paris	300, 450, 600	P G	X	0.40	Great Britain
Nellorc ¹⁹	MEW	220	Cuba Distilling Co., 49, Exchange Place, New York (N.Y.)	300, 600	P G	X	0.40	Great Britain
Nelly Lasry ¹	FLC	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	France
Nelson ⁹ 121	KNL	300	—	300, 600	P G	X	0.40	United States of America
Nemaha ⁹ 121	KUSR	—	Navy	300, 600	P G	X	0.40	United States of America
Nembo	IJA	—	Lindsay Swan, Hunter, Ltd.	300, 600	P	X	—	Italy
Nemesis ⁷¹	MSM	150	—	300, 600	P G	X	—	Great Britain
Neotfield ¹⁹	GCKS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Neponset ¹⁰³	WQIO	300	Navy	300, 600	P G	X	0.40	Great Britain
Neptun OVQ ¹	OVQ	—	Salvage ship belonging to the Bergnings-och Dyker-Aktie- bolaget, Neptun, Stockholm	600	O ³⁹	X	—	Denmark
Neptun SDV ¹	SDV	150	Neptune Line Incomp., 1, Broad- way, New York (N.Y.)	300, 600	P	X	0.40	Sweden
Neptune KUN	KUN	200	Navy	300, 600	P G	X	—	United States of America
Neptune NMS ⁸⁹	NMS	—	Remy & Huret (Armateurs), Boulogne-sur Mer	300, 600	P G	X	0.40	United States of America
Neptune UKR ¹	UKR	150	Job Bros. & Co., Ltd.	300, 600	P G	X	0.40	France
Neptune VOX	VOX	150	Société des Services Contractuels des Messageries Maritimes, Paris	300, 600	P G	X	0.40	Newfoundland
Néra ¹	FNN	300	Navy	300, 600	P G	X	0.40	France
Nerbudda ¹⁹	GBML	230	—	300, 800	P G	X	0.40	Great Britain
Nérède FARI	FARI	—	Cossovich T., Trieste	300, 600	P G	X	0.05	Italy
Nereide UTK ¹⁷	UTK	140	Navy	300, 600	P G	X	0.40	United States of America
Nereus ⁸⁹	NNF	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Nero ⁸⁹	NEDX	—	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	Belgium
Nervier ¹⁰	OPN	150-200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Nesco ⁴⁷	KBBT	300	—	300, 600	P G	X	4.00	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per-Word.	Minimum per Radio-telegram.	
Neshaminy ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Neshobee ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Nessian ¹⁹	..	160	—	300, 600	P G ..	X	0.40	—	Great Britain
Nestlea ²⁰	..	250	—	300, 600	P G ..	X	0.40	—	Great Britain
Nestor ²¹	..	270	—	300, 600	P G ..	X	0.40	—	Great Britain
Netale L. ¹⁷	..	110	Operated by A. Hølt & Co., Managers, Liverpool	—	P G ..	X	0.40	—	Italy
Nequen ¹⁵	..	120	Eredi Guiseppe Lavarello, Genoa	300, 600	P G ..	N	0.40	—	Brazil
Neuralia ¹⁹	..	220	Companhia Lloyd Nacional, Rio de Janeiro	300, 600, 2,100, 2,200 c.w.	P G ..	X	0.40	—	Great Britain
Neuse ^{9 121}	..	250	—	300, 450, 600	P G ..	N	0.40	—	United States of America
Neva ¹⁹	..	130	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	Great Britain
Nevada NCA ¹⁹	Navy	300, 600	P G ..	N	0.40	—	United States of America
Nevada OHSA ⁴⁰	..	250	—	300, 450, 600, 800	P G ..	X	0.40	—	Denmark
Nevada UFG ¹	..	250	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600	P G ..	X	0.40	—	France
Nevadan ¹²⁴	..	250	Compagnie Générale Transatlantique, 6, Rue Auber, Paris	300, 450, 600	P G ..	X	0.40	—	United States of America
Nevasa ¹⁹	..	250	American-Hawaiian Steamship Co., 8, Bridge St., New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Nevisian ¹⁹	..	160	—	300, 600, 2,100, 2,200 c.w.	P G ..	X	0.40	—	Great Britain
Newa ⁴⁰	..	200	—	300, 600	P G ..	N	0.40	—	Great Britain
Newark	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	—	Denmark
Newaster ¹⁹	..	150	Navy	—	P G ..	X	0.40	—	Great Britain
Newbigging ¹⁹	..	120	—	300, 600	P G ..	X	0.40	—	Great Britain
New Brighton ¹⁹	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
New Britain ¹²¹	..	300	Great North Western Shipping Corp., 67, Exchange Place (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
New Brooklyn ¹⁹	..	180	—	300, 600	P G ..	X	0.40	—	Great Britain
New Brunswick ¹⁹	—	300, 600	P G ..	X	0.40	—	Great Britain
Newburgh ¹⁹	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America

Shipboard Stations

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Newby Hall ¹⁹ Newchang ²¹	140 100	ZOE, GDYQ	Operated by the China Navigation Co., Ltd., 8, Billiter Square, London	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	Great Britain Great Britain
New Columbia ¹⁸ New England ¹⁰⁸	300	GDGS KUCB	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	Great Britain United States of America
New Georgia ¹⁹ New Hampshire KXF ¹⁰³	150	GBSY KXF	New England S.S. Co., Fall River (Mass.)	300, 600 300, 600	P G P G	X X	0.40 0.40	Great Britain United States of America
New Hampshire NME	—	NME	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Newhaven Newhaven FZH ¹⁴	300 150	— FZH	French State Railways Administration des Chemins de Fer de l'Etat, Paris	600 300, 600	P G	X X	0.15	Great Britain France
New Haven KXN ⁹ ¹³¹	150	KXN	New England S.S. Co., Fall River (Mass.)	300, 600	P G	X	0.40	United States of America
Newington ²	100	VDP	Govt. Station, Dept. Marine and Fisheries, Ottawa (Ont.)	300, 600	O	X	—	Canada
New Jersey KDWD	200	KDWD	Texas Company, Port Arthur (Texas)	300, 600	P G	X	0.40	United States of America
New Jersey NMF ⁹⁹	—	NMF	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Newlands ¹⁹ New Londonet ³⁰	140 100	ZYO GBRZ	—	300, 600 300, 600	P G P G	X X	0.40 0.10 ⁸⁷	Great Britain Great Britain
New Mexico ¹⁹ New Orleans KDFB ¹⁰⁸	— 300	GBSX KDFB	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 450, 600	P G P G	X X	0.40	Great Britain United States of America
New Orleans NMG ⁹⁹	—	NMG	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
New Orleans WYDH ¹²⁵	350	WYDH	—	450, 600, 900, 1,100	P G	N	—	United States of America
Newona ²⁴	200	CJW	Fraser, Brace & Clarke, Ltd., Montreal (P.Q.)	300, 600	P	— ²⁷	0.20	Canada
Newport News ⁹⁹	—	NHZ	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Newport NMH ⁹⁹	—	NMH	Navy	300, 600	P G	N	0.40 ¹¹²	United States of America
Newport WWH ¹⁰¹	200	WWH	Pacific Mail S.S. Co., 508, Market Street, San Francisco (Cal.)	300, 600	P G	N	0.40 ¹¹²	United States of America
Newquay ¹⁹ New Texas ¹⁹	120	BDK GCLW	—	300, 600 300, 600	P G P G	X X	0.40 0.40	Great Britain Great Britain
Newton FAWT	—	FAWT	Navy	300, 600	P G	N	0.05	France
Newton GBTJ ¹⁹ Newton KZX ¹⁰⁸	— 300	GBTJ KZX	New England Fuel and Trans. Co., 11, Devonshire St., Boston (Mass.)	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	Great Britain United States of America
Newton Hall Newtonmoor ¹⁹	160	ZZD EVN	—	300, 600 300, 450, 600	P G P G	X X	0.40 0.40	Great Britain United States of America
New Toronto ¹⁹ New Windsor ⁹ ¹³¹	200 300	GCLV KGAE	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600	P G P G	X X	0.40 0.40	Great Britain Great Britain
New York KSN ¹⁰³	200	KSN	United Transatlantic Lines (Incorp.)	300, 450, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
New York KUW ¹⁰³	KUW	300	Texas Company, Port Arthur (Texas) Navy	300, 450, 600	P G	X	0.40	—	United States of America
New York NCC ⁹⁹	NCC	—	.. ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
New York PHN ¹	PHN	150	American Petroleum Co., Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
New York City ¹⁹	BQU	145	.. ..	300, 600	P G	X	0.40	—	Great Britain
N. F. Hoffding	OGNA	350	Aktieselskabet Dampskibsselskabet Vendia, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Ngakuta ⁷¹	BHP	200	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	X	0.40 ⁹¹	—	Great Britain
Niagara FTB ¹	FTB	350	Compagnie Générale Transatlantique, Paris	300, 600	P G	N	0.40	—	France
Niagara GBE ⁷¹	GBE	350	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	N	0.40 ⁹¹	—	Great Britain
Niagara NABC ⁹⁹	NABC	—	.. ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Nias ¹	PGR	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Nicea ³⁵	DNI	200	.. ..	300, 450, 600	P G	X	0.40	4.00	Germany
Niceto de Larrinaga ¹⁹	ZNS	170	.. ..	300, 600	P G	X	0.40	—	Great Britain
Nicholas ¹⁰²	NUNZ	—	.. ..	300, 600	P G	N	—	—	United States of America
Nicholson ⁹⁹	NIU	—	.. ..	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Nickerie ^{1, 11}	PER	175	Koninklijke West Indische Maildienst, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Nicolaas ^{1, 11}	TZN	100	W. H. Berghuys Kolenhandel, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Nicolaos ¹⁷	IYK	140	Società Nazionale di Navigazione, Genova	300, 600	P G	X	0.40	—	Italy
Nicolaos Athanasulis ¹	SVI	100-150	Athan Athanasulis, Piraeus	300, 600	P G	X	0.40	4.00	Greece
Nicolaos Zafirakis ¹	SWRS	150-200	C. H. Zafirakis, Chios	300, 600	P G	X	0.40	4.00	Greece

	HRW		200		Mory & Cie., Rue Charles Butor, Boulogne-sur-Mer	300, 450, 600	P G		0.40		France
Nicolas Jean ¹	200	FYR	Mory et Cie., Boulogne-sur-Mer ..	300, 600	P G	..	0.40	—	France
Nicolas Norbert ¹	200	IUN	Ente Trasporti Cotoni, Genoa ..	300, 600	P G	..	0.40	—	Italy
Nicola II ¹⁷	140	MLV	—	300, 600	P G	..	0.40	—	Great Britain
Nicoya ¹⁹	150	GBRF	—	300, 600	P G	..	0.40	—	Great Britain
Nichero ¹⁹	275	LEK	(Armateurs) A/S, Norsk	300, 600	P G	..	—	—	Norway
Nidaros ¹	110	OGV	Bjergningskompani, Christiania	300, 600	P G	..	—	—	Norway
Nidaros OGV	200	OGV	Aktieselskabet det Forende Damps- skibsselskab, Copenhagen	300, 450, 600, 800	P G	..	0.40	4.00	Denmark
Niederwald ³⁵	200	DND	(Armateur) B. Stolt Nielsen,	300, 600	P G	..	0.40	4.00	Germany
Niels Nielsen ³⁵	200-250	LGH	Haugesund	300, 600	P G	..	0.40	4.00	Norway
Niels R. Finsen ⁴⁰	300	OIN	Aktieselskabet Dampskibsselskabet	300, 600	P G	..	0.40	4.00	Denmark
Nienburg ³⁵	200	DNU	Norden, Copenhagen	300, 450, 600, 800	P G	..	0.40	4.00	Germany
Nieuwe Maas ¹	150	OLB	Hollandsche Algemene Atlantische- Scheepvaart, Maatschappij, Kot- terdam	300, 450, 600, 800, 1,800	P G	..	0.40	4.00	Holland
Nieuw Amsterdam ¹	Day	PEB	Nederlandsche — Amerikaansche	300, 450, 600, 800, 1,800	P G	..	0.40	4.00	Holland
Nieuw Amsterdam ¹	500	PEB	Stoomvaart Maatschappij, Hol- land-Amerika Lijn, Rotterdam	300, 450, 600, 800, 1,800	P G	..	0.40	4.00	Holland
Nieuw Amsterdam ¹	Night	PEB	Navy	300, 450, 600, 800, 1,800	P G	..	0.40	4.00	Holland
Nièvre FANZ	1,000	FANZ	Compagnie Générale Transatlan- tique, Paris	600, 800	P G	..	0.05	—	France
Nièvre (La) FGN	150	FGN	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 600	P G	..	0.10	—	France
Nigarian ²¹	—	ESZ	Fraissinet & Cie. (Compagnie Mar- seillaise de Navigation à Vapeur, Marseilles)	300, 450, 600	P G	..	0.40	—	Great Britain
Niger ¹	180	FNA	Navy	300, 600	P G	..	0.40	—	France
Niitaka ¹	—	JLN	Navy	—	O	..	—	—	Japan
Nijkerk ¹	200	PDAB	Vereenigde Nederlandsche Scheep- vaart Maatschappij, The Hague	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Nika ¹⁰³	200	KOPM	H. K. Goodwin	300, 450, 600	P G	..	0.40	—	United States of America
Niki	—	SYN	Navy	300, 600, 1,800	O	..	—	—	Greece
Nikko Maru ¹	400	JNL	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	..	0.40	—	Japan
Nile GCYV ¹⁹	—	GCYV	U.S. Shipping Board, Washington	300, 450, 600	P G	..	0.40	—	United States of America
Nile KOSD ¹⁰³	300	KOSD	(D.C.)	300, 450, 600	P G	..	0.40	—	United States of America
Nile VRE ¹	300	VRE	Nile Steamship Company	300, 600	P G	..	0.40	4.00	Hong Kong
Nilemede ¹⁹	—	XJM	(Armateur) Aktieselskabet Nesjar, Larvik	300, 600	P G	..	0.40	4.00	Great Britain
Nils ¹	60-80	LWV	Navy	300, 600	P G	..	0.40	—	Norway
Nimrod	—	GEKT	Navy	300, 600	P G	..	—	—	Great Britain
Nina BGI (La) ¹⁰	—	BGI	Fratella Bianchi di S., Genoa ..	300, 600	P G	..	0.40	—	Italy
Nina IPC ¹⁷	140	IPC	De Luca Vincenzo, Naples	300, 600	P G	..	0.40	—	Italy
Ninta ¹⁷	110	ITV	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	..	0.40	—	Great Britain
Ningchow ²¹	—	YOV	Managers, Liverpool	300, 450, 600	P G	..	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Ninian ¹⁹	MEB	170	Navy	300, 600	P G	N	0.40	—	Great Britain
Nino Bixio	IKF	—	—	—	—	—	—	—	Italy
Niobe ¹	AKB	—	Navy	—	O	N	—	—	Germany
Niord	SBF	—	Navy	—	O ¹⁰	—	—	—	Sweden
Nipmuc ¹⁰³	KOQX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Nippon ¹	SIO	350	Aktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg, Sweden	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030	0.40	4.00	Sweden
Nipponier ¹⁰	ONN	100-150	East Asia Line	—	—	—	—	—	—
Nipsic ⁹⁷	KDJJ	—	Lloyd Royal Belge (Antwerp)	300, 600	P G	X	0.40	4.00	Belgium
Nirpura ¹⁹	GFJD	—	—	300, 450, 600	P G	X	0.40	—	United States of America
Nirvana ¹⁹	MZW	270	Kaya Shosen Kaisha	300, 600	P G	X	0.40	—	Great Britain
Nishiyama Maru ¹	JNZ	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Nishmaha ¹⁰³	KEVM	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Nissei Maru ¹	JIF	200	—	300, 600	P ³⁸	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Nisshin ¹	JRK	—	Navy	—	O	—	—	—	Japan
Nith	GKOF	—	Navy	—	P G	—	—	—	Germany
Nitokris	DNS	200	—	300, 600	P G	X	0.40	4.00	Germany
Nitonian ¹⁹	YSD	170	—	300, 600	P G	N	0.40	—	Great Britain
Nitro ¹⁹	NELL	—	Navy	300, 600	P G	N	0.40 ¹¹¹	—	United States of America
Nixe ³⁵	DNX	60	—	300, 600	P G	X	0.40 ¹¹²	—	Germany
Nizam ¹⁰	YBC	—	—	300, 600	P G	X	0.12	—	Great Britain
No ⁴	NUKF	—	Navy	300, 600	P G	X	0.40 ¹¹¹	—	United States of America
Nobles ⁹ 151	KODB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40 ¹¹²	—	United States of America
Noccalula ¹⁰³	KORF	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Nockum ⁹⁷	KOGJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Noddle Island ⁹⁷	KUKK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America

Noktaty	300	KOCF	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	United States of America	United States of America
Nokomis ¹⁰²	—	NAMM	—	300, 600	P G	—	United States of America
Nolssement ¹⁹	130	GVO	—	300, 600	P G	0.40	Great Britain
Noma ¹⁷	300	KVO	Rodman Wanamaker	300, 450, 600	P G	0.20	United States of America
Nomentun ¹⁷	140	UQZ	Eserizio Navigazione di Stato	300, 600	P G	0.40	Italy
Nonantum ⁹⁷	300	KIXP	Rome	300, 600	P G	0.10	United States of America
Noord ¹	150	HDK	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40	Holland
Noordam ¹	Day 500 Night 1000	PEC	Houtvaart, Rotterdam	300, 600	P G	0.40	Holland
Noorderdijk ¹	150	PDL	Hollandsche — Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800, 1,800	P G	0.40	Holland
Noordwijk ¹	150	PHG	Solleveld & Van Der Meer en T. H. Van Hattum's, Stoomvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G	0.40	Holland
Nora ^{9 131}	300	KDGZ	Erhardt & Dekkers, Rotterdam	300, 450, 600, 800	P G	0.40	Holland
Nora Saliari ¹	150-200	SWN	W. R. Grace & Co., Inc., 7, Hanover Square, New York (N.Y.)	300, 450, 600, 800	P G	0.40	United States of America
Norburn ¹⁹	120	XID	Saliaris and Negropontes, Piraeus	300, 600	P G	0.40	Greece
Nord ³¹	200	FZN	Société Anonyme de Gérance et d'Armenet, Paris	300, 600	P G	0.15	Great Britain
Nord African	250	UIC	Société Algérienne de Constructions Navales et Mécaniques, Algiers	300, 600	P G	0.40	France
Nordamerika ⁴⁰	200	OXT	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	0.40	Denmark
Norddijk ¹	200	PYX	Solleveld and Van Der Meer en T. H. Van Hattum's, Stoomvaart Maatschappij, Rotterdam	300, 600	P G	0.40	Holland
Norden ⁴⁰	—	—	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	—	—	—	Denmark
Norden ¹	—	AMJ	Navy	—	—	—	Germany
Nordenney ¹	250	DOV	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	0.40	Germany
Nordfarer ⁴⁰	200	OGC	(Armenet) Gorrissen & Co., Christiania	300, 450, 600, 800	P G	0.40	Denmark
Nordfjeld ¹	150-200	TRO	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 600	P G	0.40	Norway
Nord Friesland ¹	200	DNT	(Armateurs) A/S Fosnes Gorrissen & Co., A/S Christiania	300, 450, 600, 800	P G	0.40	Norway
Nordhav ¹	100-125	AVB	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 600	P G	0.40	Norway
Nordhavet ⁴⁰	200	OYM	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	0.40	Denmark
Nordhvalen ⁴⁰	200	OXZ	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G	0.40	Denmark
Nordic ¹	250	SGG	Gothenburg Australia Line, Rederiaktiebolaget Trausatlantic, Gothenburg	300, 600	P	0.40	Sweden

(local mean time)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Nordkap ⁴⁰	..	250	Aktieselskabet Dampskibsselskabet Norden, Copenhagen Navy.	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Nordkaperen ⁴⁰	..	—	(Armateur) ..	600	O ..	X	—	—	Denmark
Nordkyn ¹	..	200-250	(Armateur) .. Gørrissen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Nordkyn II ¹	..	150-200	(Armateur) Albert Harloff, Bergen	300, 600	P G ..	X	0.40	4.00	Norway
Nordland ¹	..	250	Angfartygsaktiebolaget Irlring, Gothenburg	300, 600	P ..	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Nordlys ⁴⁰	..	300	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Nordnaes ¹	..	200	(Armateurs) Louis Poulsen & Co., Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Nordsee ¹	..	—	Navy	—	O ..	N	—	—	Germany
Nordstjernen ⁴⁰	..	300	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Nordstrand ¹	..	300	(Armateur) C. B. Nielsen, Skien	300, 600	P G ..	X	0.40	4.00	Norway
Nordvaag ¹	..	150-200	(Armateurs) Gørrissen & Co., A/S Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Nore ¹⁰	..	210	(Armateurs) A/S den Norske Amerikalinje, Christiania	300, 600	P G ..	X	0.40	—	Great Britain
Norefjord ¹	..	150-200	—	300, 600	P G ..	X	0.40	4.00	Norway
Norfolk GDKY ¹⁰	..	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Norfolk GJFZ ¹⁰	..	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Norfolk WZUA ^{9 131}	..	300	Coastwise Transportation, 40, Central Street, Boston (Mass.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Norfolk Maru ¹	..	400	Kawasaki Zosenjo ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Norfolk Range ¹⁰	..	100	Navy ..	300, 600	P G ..	X	0.40	—	Great Britain
Norge	—	—	—	O ..	—	—	—	Norway
Norlina ^{9 131}	..	300	Garland Steamship Corporation, 16, California St., San Francisco (Cal.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Norma ¹⁰	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America

Country	Company	Capital	Assets	Liabilities	Net Worth	Rating	Notes
United States of America	Pan-American Petroleum and Transport Co., 115, Security Building, Los Angeles (Cal.)	300, 450, 600	300, 450, 600	—	—	—	—
France	Compagnie des Messageries Maritimes, Paris	300, 600	300, 600	—	—	—	—
Great Britain	Société des Pêcheries de Fécamp, Fécamp	300, 600	300, 600	—	—	—	—
Denmark	Aktieselskabet Dampskibsselskabet Norden, Copenhagen	300, 450, 600, 800	300, 450, 600, 800	—	—	—	—
Canada	Northern Navigation Co., Ltd., Samia (Ont.)	300, 600	300, 600	—	—	—	—
United States of America	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 450, 600	300, 450, 600	—	—	—	—
Great Britain	American Metal Transportation Company, 61, Broadway, New York (N.Y.)	300, 450, 600	300, 450, 600	—	—	—	—
United States of America	Chicago Duluth & Georgian Bay S.S. Co., Chicago (Ill.)	300, 600	300, 600	—	—	—	—
India	Royal Indian Marine	300, 450, 600, 1,000	300, 450, 600, 1,000	—	—	—	—
United States of America	American Star Line, 26, Beaver St., New York (N.Y.)	300, 600	300, 600	—	—	—	—
Great Britain	Eastern S.S. Lines, India Wharf, Boston (Mass.)	300, 450, 600	300, 450, 600	—	—	—	—
United States of America	Atlas S.S. Company, 2, Pine St., San Francisco (Cal.)	300, 450, 600	300, 450, 600	—	—	—	—
United States of America	North Pines Steamship Company, 18, Broadway, New York (N.Y.)	300, 600	300, 600	—	—	—	—
United States of America	U.S. Shipping Board, Washington (D.C.)	300, 600	300, 600	—	—	—	—
United States of America	Niagara, St. Catharines & Toronto Navigation Co., Ltd., Toronto (Ont.)	300, 600	300, 600	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type)	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Northumberland ZBL ¹⁹ ..	ZBL	180	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Northway ¹⁹ ..	GBER	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Northwestern ⁹⁷ ..	WAN	100	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 440, 525, 600	P G ..	N	0.20	—	United States of America
Northwestern Bridge ⁹ 131	KONK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
North Western Miller ¹⁹	MTV	200	—	300, 600	P G ..	X	0.40	—	Great Britain
North Wind ² ..	KYB	75	A. C. Burton	300, 600	P ..	X	—	—	United States of America
Norton ¹⁹ ..	OEH	140	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Nortonian ¹⁹ ..	MEO	170	—	300, 600	P G ..	X	0.40	—	Great Britain
Noruega ¹ ..	LDG	180	(Armateurs) Norway-Mexico Gulf Line, Tonsberg	300, 600	P G ..	N	0.40	—	Norway
Norumbega ¹⁰³ ..	KOZX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Norway Maru ¹ ..	JNW	400	Kawasaki Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Norwegian ¹⁹ ..	GDMC	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Norwich City ¹⁹ ..	EXB	145	—	300, 600	P G ..	X	0.40	—	Great Britain
Norwood ⁹⁷ ..	WSG	300	Pacific American Fisheries, South Bellingham (Wash.)	300, 450, 525, 600	P G ..	N & X	0.40	—	United States of America
Notanda ¹⁹ ..	XFZ	100	—	300, 600	P G ..	X	0.40	—	Great Britain
Notre-Dame de Fourvières ¹	FXO	250	Compagnie de Navigation Mixte, 54, Rue Canebière Marseilles	300, 600	P G ..	X	0.40	—	France
Notre-Dame de Lourdes ¹	FHB	—	Fourny & Cie., Boulogne-sur-Mer	—	P G ..	X	0.40	—	France
Notre-Dame des Dunes ¹	FVY	180	Christians & Bourgoin Freres, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Notre-Dame D'Espérance ¹	FYE	150	E. & J. Delpierre & Fils, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Nottingham ⁷¹ ..	ZCO	—	Great Central Railway Company	300, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Norton ¹⁹ ..	GCZV	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Noun ¹ ..	FPY	—	Compagnie de Navigation Paquet, Marseilles	—	P G ..	N	0.40	—	France

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
O.6 ⁹⁸	NANB	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.7 ⁹⁹	NAMC	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.8 ⁹⁹	NAND	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.9 ⁹⁹	NAGB	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.10 ⁹⁹	NAXT	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.11 ⁹⁹	NETK	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.12 ⁹⁹	NETL	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.13 ⁹⁹	NEZN	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.14 ⁹⁹	NEVD	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.15 ⁹⁹	NAXS	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O.16 ⁹⁹	NASM	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
O. A. Brodin ¹	SLD	250	Erik Brodins Rederi Aktiebolag, Torö	300, 600	P	N	0.20 111 0.40 111	4.00	Sweden
O. A. Hermanson ²	WRA	—	Sunset Fuel Oil Company	300, 600	P G	0700 to 0800 1100 to 1200 1500 to 1600	—	—	United States of America
Oak Branch ¹⁹	ETC	170	—	300, 600	P G	1900 to 2000 2000 to 2200	0.40	—	Great Britain
Oakfield ¹⁹	MXF	140	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Great Britain
Oakland ¹⁰³	KMOO	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Oaklands Grange	ZEQ	140	—	300, 600	P G	N	0.40	—	Great Britain
O. A. Knudsen ¹	TVE	250	(Amateur) Knut. Knutsen O.A.S. Hangesund	300, 600	P G	N	0.40	—	Norway
Oakwin ¹⁹	NLD	155	—	300, 600	P G	N	0.40	—	Great Britain

SHIP	CALL LETTERS	CLASS	OPERATOR	TONNAGE	TYPE	PORT	AGENCY	STATUS
Oanfa ¹⁹	Operated by Cayzer Irvine & Co., Ltd., 2, St. Mary Axe, London, E.C.3.	300, 600	P G	..	United States of America	..
Oaxaca ²¹	Navy	300, 600	P G	..	Great Britain	..
O'Hannon ⁹⁹	Navy	300, 600	P G	..	United States of America	..
Oberbürgermeister Haken ³⁶	Navy	300, 600	P G	..	Germany	..
Oberon ¹	Navy	300, 600	P G	..	Holland	..
Oberschlesien ³⁵	Navy	300, 600	P G	..	Germany	..
Odra ¹⁹	Navy	300, 600	P G	..	Great Britain	..
O'Brien CBN	Navy	300, 600	P G	..	Chile	..
O'Brien NIV ⁸⁹	Navy	300, 600	P G	..	United States of America	..
Obstine ¹	Navy	300, 600	P G	..	France	..
O'Byrne	Navy	300, 600	P G	..	France	..
Occidental	Navy	300, 600	P G	..	United States of America	..
Occidente (El) ¹⁰³	Navy	300, 600	P G	..	United States of America	..
Ocean FYO ¹	Navy	300, 600	P G	..	France	..
Ocean PDS ¹	Navy	300, 600	P G	..	Holland	..
Oceania ¹⁷	Navy	300, 600	P G	..	Italy	..
Ocean Monarch ¹⁹	Navy	300, 600	P G	..	Great Britain	..
Oceano ¹⁷	Navy	300, 600	P G	..	Italy	..
Ocean Prince ¹⁹	Navy	300, 600	P G	..	Great Britain	..
Ocean Transport ¹⁹	Navy	300, 600	P G	..	Great Britain	..
Ockenfels ³⁵	Navy	300, 600	P G	..	Germany	..
Ocant	Navy	300, 600	P G	..	France	..
Octavia ³⁵	Navy	300, 600	P G	..	Germany	..
Octorara ¹⁰¹	Navy	300, 600	P G	..	United States of America	..
Oden	Navy	300, 600	P G	..	Sweden	..
Odessa ¹	Navy	300, 600	P G	..	Sweden	..
Odet ¹	Navy	300, 600	P G	..	France	..
Odin DDK ³⁶	Navy	300, 600	P G	..	Germany	..
Odin, DON ³⁵	Navy	300, 600	P G	..	Germany	..
Odin DOQ ³⁵	Navy	300, 600	P G	..	Germany	..
Oceola ⁹⁹	Navy	300, 600	P G	..	United States of America	..
Oehringen ¹⁹	Navy	300, 600	P G	..	Great Britain	..
Ogasawara Maru ¹	Navy	300, 600	P G	..	Japan	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Per formed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-tele-gram.	
Ogon	..	250	Compañia de Navegacion la Blanca, Bilbao	600, 900	O	X	—	—	Russia
Ogono ¹	..	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.30	3.00	Spain
Ogontz ¹⁰³	..	300	Navy.	300, 600	P G	X	0.40	—	United States of America
O'Higgins	..	—	American-Hawaiian S. Company	300, 600	P G	X	—	—	Chile
Ohioan ¹³⁴	..	200	52, Broadway, New York	300, 600	P G	X	0.40	—	United States of America
Ohio FSR ¹	..	250	Compagnie Générale Transatlantique, 6, Rue Auber, Paris	300, 600	P G	X	0.40	—	France
Ohio GJKY ¹⁹	..	—	Navy.	300, 450, 600, 2,100, 2,200	P G	X	0.40	—	Great Britain
Ohio NMW ⁹⁹	..	—	Navy.	2,400	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ohio Maru ¹	..	400	Kawasaki Zosenjo	300, 600	P G	—	0.40	—	Japan
Ohonkara ²	..	—	Carl Tucker	300, 600	—	—	—	—	United States of America
Oise FBOI ¹	..	—	Navy.	300, 800	P G	—	—	—	France
Oise FXE ¹	..	200	Compagnie Générale Transatlantique, Paris	300, 450, 600	P G	N	0.05 0.40	—	France
Oituz	..	150	Marine Department of the Roumanian Government	300, 600	O	N	—	—	Roumania
Okara ¹⁹	..	170	Teishinsho Ministry of Communications	300, 600	P G	X	0.40	—	Great Britain
Okinawa Maru ¹	..	350	Navy	300, 600	P G	—	—	—	Japan
Okinoshima ¹	..	—	Navy	—	O	—	—	—	Japan
Oklahoma ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹³ 0.40 ¹¹⁴	—	United States of America
Oklahoma City	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Olaf ⁴⁰	..	—	Aktieselskabet Det Forenede Dampskib-Selskab, Copenhagen (Armateur)	—	—	—	—	—	Denmark
Olaf Kyrre ¹	..	300	Bergen & Helland, Bergen	300, 600	P G	X	0.40	4.00	Norway
Olaf L. Kongsted ⁴⁶	..	100	Rederiaktieselskabet Triton, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.0	Denmark
Olavaria ¹	..	150	Compañia Maritima del Nervion, Bilbao	300, 600	P G	N	0.30	3.00	Spain

Olbia ¹	..	FJK	200	Compagnie Générale de Pêche Maritime et d'Approvisionnement en Poisson, 3, Rue Scribe, Paris	300, 600	P G	..	X	0.40	—	France
Oldekerk ¹	..	OMO	150	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague (D.C.)	300, 450, 800, 800	P G	..	X	0.40	4.00	Holland
Oldham ^{9 121}	..	KDQG	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Olen ^{9 121}	..	KINR	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Oleum ¹⁰¹	..	WTD	150	Union Oil Co. of California, Oleum (Cal.)	300, 600, 1,800	P G	..	X	0.40 ¹²²	—	Denmark
Olfert Fischer ⁴⁰	..	OUF	—	Navy	600	O ³	—	X	—	—	Denmark
Olga S. ⁴⁰	..	—	—	Aktieselskabet Dampskibsselskabet Torshavn, Copenhagen	300, 600	P G	..	X	0.40	—	Italy
Olimpo ¹⁷	..	UTM	140	Cosovitch T., Trieste	300, 600	P G	..	X	0.40	—	Brazil
Olinda ¹³	..	SRL	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	..	—	—	—	Cuba
Olinda	..	XA	—	Compania Maritima, Cubana	300, 600	P G	..	X	0.40	—	Panama (Free Town of)
Oliva DTO ³³	..	DTO	200	Artus Danziger Reederei- und Handels-Aktiengesellschaft, Danzig	300, 600	P G	..	X	0.40	—	Great Britain
Oliva ZLO ¹⁹	..	ZLO	210	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P G	..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Olive ¹⁹	..	GDVC	—	—	300, 600	P	..	X	0.40	4.00	Sweden
Ojaren ¹	..	SLI	250	—	300, 600	—	..	—	—	—	—
Olha ⁷¹	..	GJBN	200	Lane and MacAndrew, Ltd., 3, Gracechurch Street, London	300, 450, 600	P	..	X	—	—	Great Britain
Oluf Maersk ⁴⁰	..	OHKA	200	Rederiet A. P. Møller, Copenhagen	300, 450, 600, 800	P G	..	X	0.40	4.00	Denmark
Olympe ¹	..	FIF	300	Société des Affréteurs Réunis, Paris	300, 600	P G	..	X	0.40	—	France
Olympia NGG ⁹⁹	..	NGG	—	Navy	300, 600	P G	..	N	0.20 ¹¹¹	—	United States of America
Olympic ^{19 77}	..	MKC	400	—	300, 600, 2,100	P G	..	N	0.40 ¹¹²	—	Great Britain
Olympier ¹⁹	..	OPY	150-200	Lloyd Royal Belge, Antwerp	2,200 GRT	P G	..	X	0.40	4.00	Belgium
Olympia MHI ¹⁹	..	MHI	175	—	300, 600	P G	..	X	0.20 ¹¹¹	—	Great Britain
Omaha ¹⁰²	..	NISL	—	—	300, 600	P G	..	N	0.40 ¹¹²	—	United States of America
Onana ³	..	VZBN	300	—	300, 600	P G	..	—	0.20 ⁸	—	Australian Commonwealth
Onana ³	..	—	—	—	300, 600	—	..	—	0.40 ⁵	—	—
Omar ⁵⁰	..	GBLF	—	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	..	—	0.40	—	Great Britain
Ombilin ¹	..	PMA	200	Nippon Yusen Kaisha (Japan Mail S.S. Co.)	300, 600	P G	..	—	0.40	4.00	Dutch East Indies
Omi Maru ¹	..	JCPA	200	—	300, 600	P G	..	—	0.40	—	Japan

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Orcus ^{9 131}	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Orduna ¹⁹	..	280	—	300, 600, 2,100, 2,400 C.W.	P G ..	N	0.40	—	Great Britain
Ordunte Mendi ¹	..	200	Sota y Aznar, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Oregon Maru ¹	..	400	Kawasaki Zosenjo	300, 600	P ³⁵ ..	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Oregon NMZ ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Oregon OIC ⁴⁰	..	350	Aktieselskabet Det Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
Oregon WGD ^{9 131}	..	150	Alaska Pacific Navigation Co., Portland, (Oregon)	300, 600	P G ..	X	0.40	—	United States of America
Oregonian ¹³⁴	..	200	American Mail Line S.S. Co., 8, Bridge Street, New York (N.Y.)	300, 600	P G ..	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Oreland ¹⁹	..	125	Navy	300, 600	P G ..	N	—	—	Great Britain
Orella	..	250	Compagnie des Messageries Maritimes, Paris	300, 600	P G ..	N	0.40	—	France
Orénoque ¹	..	100	Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Orestes PYC ¹	..	175	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G ..	X	0.40	—	Great Britain
Orestes YTN ⁷¹	..	150-200	Navy	300, 600	P G ..	N	—	—	Italy
Orico	..	230	Armateurs Fearnley & Eger, Christiania	300, 600	P G ..	X	0.40	4.00	Norway
Oria ¹	..	400	Tatsuuma Kisen Kaisha	300, 600, 2,100, 2,200 C.W.	P G ..	N	0.40	—	Great Britain
Oriana ¹⁹	..	150	—	300, 600	P G ..	N	0.40	—	Japan
Oridono Maru ¹	..	300	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Orient City ¹⁰	..	180	Société Française Pêcheries à Vapeur, Bologne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Orient UHB ¹	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Orient KOLC ^{9 131}	..	300	—	300, 450, 600	P G ..	X	0.40	—	United States of America

River, New York (N.Y.)		Great Britain		United States of America	
Orinoco S.S. Corporation, 39, Broadway, New York (N.Y.)	400	300, 600	P G	300, 450, 600	X
Compañia Naviera Orlo, Bilbao	300	300, 450, 600	P G	300, 450, 600	X
Navy	100	300, 600	P G	300, 600	N
Government	150	300, 600	P G	300, 600	N
Koninklijke Nederland Stoomboot	150	300, 600	P G	300, 600	X
Maatschappij, Amsterdam	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Aktieselskabet Dampskibsselskabet	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Orion, Copenhagen	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
U.S. Shipping Board, Washington	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
(D.C.)	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Navy	200	300, 600	P G	300, 600	X
Marittima Italiana Società di Navigazione per Servizi Postali, Genova	200	300, 600	P G	300, 600	X
Orinoco S.S. Corporation, 39, Broadway, New York (N.Y.)	210	300, 600	P G	300, 600	X
New York and Cuba Mail S.S. Co., Pier 39, North River (N.Y.)	230	300, 450, 600, 800	P G	300, 450, 600, 800	N
Aktieselskabet Dampskibsselskabet	250	300, 450, 600, 800	P G	300, 450, 600, 800	N
(Armateur) Ivar An. Christiansen, Dannebrog, Copenhagen	300	300, 450, 600, 800	P G	300, 450, 600, 800	N
Christiania	300	300, 600	P G	300, 600	X
Rederiaktiebolaget Orlando, Sundsvall	150-175	300, 600	P G	300, 600	X
Société Maritime Auxiliaire de Transports, Nantes	200	300, 600	P G	300, 600	X
Orleans S.S. Corporation, 39, Broadway, New York (N.Y.)	300	300, 450, 600	P G	300, 450, 600	X
(Armateurs) Det Nordenfjeldske Dampskibsselskab Trondhjem	175-200	300, 600	P G	300, 600	X
Navy	230	300, 600	P G	300, 600	X
Navy	230	300, 800	P G	300, 800	X
Ormen	350	300, 600, 800	O ⁹⁹	300, 600, 800	X
Ormes	350	300, 450, 600	P	300, 450, 600	X
Ormidale	300	300, 450, 600	P G	300, 450, 600	X
Ormonde	280	300, 600, 2,100, 2,200 c.w.	P G	300, 600, 2,100, 2,200 c.w.	X
Orinoco S.S. Corporation, 39, Broadway, New York (N.Y.)	400	300, 600	P G	300, 600	X
Compañia Naviera Orlo, Bilbao	300	300, 450, 600	P G	300, 450, 600	X
Navy	100	300, 600	P G	300, 600	N
Government	150	300, 600	P G	300, 600	N
Koninklijke Nederland Stoomboot	150	300, 600	P G	300, 600	X
Maatschappij, Amsterdam	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Aktieselskabet Dampskibsselskabet	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Orion, Copenhagen	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
U.S. Shipping Board, Washington	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
(D.C.)	200	300, 450, 600, 800	P G	300, 450, 600, 800	X
Navy	200	300, 600	P G	300, 600	X
Marittima Italiana Società di Navigazione per Servizi Postali, Genova	200	300, 600	P G	300, 600	X
Orinoco S.S. Corporation, 39, Broadway, New York (N.Y.)	210	300, 600	P G	300, 600	X
New York and Cuba Mail S.S. Co., Pier 39, North River (N.Y.)	230	300, 450, 600, 800	P G	300, 450, 600, 800	N
Aktieselskabet Dampskibsselskabet	250	300, 450, 600, 800	P G	300, 450, 600, 800	N
(Armateur) Ivar An. Christiansen, Dannebrog, Copenhagen	300	300, 450, 600, 800	P G	300, 450, 600, 800	N
Christiania	300	300, 600	P G	300, 600	X
Rederiaktiebolaget Orlando, Sundsvall	150-175	300, 600	P G	300, 600	X
Société Maritime Auxiliaire de Transports, Nantes	200	300, 600	P G	300, 600	X
Orleans S.S. Corporation, 39, Broadway, New York (N.Y.)	300	300, 450, 600	P G	300, 450, 600	X
(Armateurs) Det Nordenfjeldske Dampskibsselskab Trondhjem	175-200	300, 600	P G	300, 600	X
Navy	230	300, 600	P G	300, 600	X
Navy	230	300, 800	P G	300, 800	X
Ormen	350	300, 600, 800	O ⁹⁹	300, 600, 800	X
Ormes	350	300, 450, 600	P	300, 450, 600	X
Ormidale	300	300, 450, 600	P G	300, 450, 600	X
Ormonde	280	300, 600, 2,100, 2,200 c.w.	P G	300, 600, 2,100, 2,200 c.w.	X

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Naut'cal Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Ormuz ¹⁰ Orn	GCJR LBJ	—	Navy	300, 600	P G ..	X	0.40	—	Great Britain Norway
Orn II ²³	LDV	160-270	(Armateurs) Aktieselskapet A/S Ornen, Sandefjord	300, 450, 600	P G ..	X	0.40	4.00	Norway
Orna ¹⁹	GNV	220	Compagnie Générale Transatlan- tique, Paris	300, 600	P G ..	X	0.40	—	Great Britain France
Orne ¹	FQO	250	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 600	P G ..	X	0.40	—	Denmark
Orneborg ⁴⁰	OIM	200	Navy	300, 450, 600, 800	P G ..	X	0.40	4.00	Sweden Chile
Ornen	SBO	—	Navy	—	O ³⁹ ..	—	—	—	Chile
Oronpello CBY	CBY	—	Borquez & Cia., Calle Blanco, 1061, Valparaiso	300, 600	P G ..	X	0.40	4.00	Chile
Oronpello CDL	CDL	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Oronoke ^{9 131}	KUNL	300	—	300, 450, 600	P G ..	N	0.40	—	Great Britain Great Britain
Oropesa ⁴⁰	GDLP	300	—	300, 450, 600	P G ..	X	0.40	—	Italy
Orówaiti ¹⁹	GFMP	—	Società Veneziani di Navigazione à Vapore, Venice	300, 600	P G ..	X	0.40	—	Italy
Orseolo ¹⁷	IYC	140	Navy	—	P G ..	—	—	—	Italy
Orsini V	IFS	—	—	300, 600	P G ..	X	0.40	—	Great Britain Great Britain
Orsino ¹⁹	GBLN	—	—	300, 600, 2,100	P G ..	X	0.40	—	Great Britain
Orsova ¹⁹	MOF	280	—	2,200 C.W.	P G ..	N	0.40	—	Great Britain
Ortega ¹⁹	MJK	220	—	300, 600, 2,100, 2,200 C.W.	P G ..	N	0.40	—	Great Britain
Orteric ¹⁹	GBJW	—	—	300, 600, 2,100, 2,200 C.W.	P G ..	X	0.40	—	Great Britain
Orthia ¹⁹	YYT	160	—	300, 600	P G ..	N	0.40	—	Great Britain
Ortinashell ¹⁹	YLB	135	—	300, 600	P G ..	X	0.40	—	Great Britain
Ortolan ¹⁹	NIKC	—	Navy	300, 600	P G ..	N	0.40 ¹¹¹ 0.40 ¹¹²	—	Great Britain United States of America
Oruba GUE ⁷¹	GUE	—	Admiralty	—	—	—	—	—	Great Britain
Oruba MGJ ¹⁹	MGJ	220	Royal Mail Steam Packet Co. ...	300, 600	P G ..	N	0.40	—	Great Britain
Orvioto ¹⁹	MOJ	250	—	300, 600, 2,100, 2,200 C.W.	P G ..	X	0.40	—	Great Britain
Orwell ¹	LWQ	600	(Armateurs) A/S Tønsberg Hvalstrand, Trondheim	300, 450, 600	P G ..	X	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Oswal ¹	SJR	250	Rederiaktiebolaget Wamadis, Helsingborg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030	0.40	4.00	Sweden
Oswego ^{9 131}	KRK	300	Union Petroleum S.S. Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Oswestry ³⁰	GDYK	100	—	300, 600	P G	X	0.40	—	Great Britain
Otakei ¹⁹	GCLN	—	—	300, 600	P G	X	0.40	—	Great Britain
Otarama ¹⁹	GTI	250	—	300, 600	P G	X	0.40	—	Great Britain
Otarie ¹	ULE	180	Ballias & Cie, Quai Rohan, Lorient	300, 450, 600	P G	X	0.40	—	France
Otari Maru No. 2 ¹	JEH	400	Sugaya Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Otavi ¹	HPW	120	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Othello SDX ¹	SDX	150	Rederiaktiebolaget Othello, Sundsvall	300, 600	P	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 0900 to 1300 1500 to 1800 2000 to 2300	0.40	4.00	Sweden
Othello YNT ¹⁹	YNT	240	—	300, 600	P G	X	0.40	—	Great Britain
Othen Stathatos ¹	SWQ	100-150	Othon Stathatos, Athens	300, 600	P G	X	0.40	4.00	Greece
Otho ^{9 131}	KULK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Otiri ¹⁹	XFD	180	—	300, 600	P G	X	0.40	—	Great Britain
Otori Maru ¹	JOT	300	Roryo Suisan Kumiai	300, 600	P G	0800 to 1100 1400 to 1800 2000 to 2400	0.40	—	Japan
Otranto ³⁵	DOO	200	—	300, 600	P G	X	0.40	4.00	Germany
Otsego ³⁷	WDG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	X	0.40	—	United States of America
Otta ¹	LHS	100-150	(Amateur) Lorentz W. Hansen, Bergen	300, 600	P G	N	0.40	4.00	Norway
Ottar Jarl ¹	TSN	150-200	(Amateurs) Det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G	X	0.40	4.00	Norway
Ottawa HSZ ¹	HSZ	250	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Ottawa LCS ¹	LCS	200	(Amateur) Fred Th. Bergh, Porsgrund	300, 450, 600	P G	X	0.40	4.00	Norway
Otterburn ³¹	YBH	—	Operated by the Guernsey Shipping Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain

200	DOH	150	WNG	150-175	Reiss S.S. Company, 402, Rockefeller Building, Cleveland (Ohio)	United States of America	United States of America	United States of America	United States of America
201	AQN	300	KJW	300	(Armateurs) Bergh & Holland, Bergen	Norway	Norway	Norway	Norway
202	PDAG	150	FGQ	200	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	United States of America	United States of America	United States of America	United States of America
203	UJW	200	UJX	150	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague	Holland	Holland	Holland	Holland
204	FCW	300	RBV	100	Compagnie Générale Transatlantique, Paris	France	France	France	France
205	UHM	160	ORU	50-100	Compagnie de Navigation Paquet, 4, Place Sadi Carnot, Marseilles	France	France	France	France
206	JYC	300	SVN	100-150	Compagnie des Chargeurs Réunis, Paris	Russia	Russia	Russia	Russia
207	KULS	200	FDT	200	Société Russe de Télégraphie et Téléphone Sans Fils	France	France	France	France
208	GKOL	300	KLAE	300	Société Maritime Nationale, 5, Rue Boudreau, Paris	Belgium	Belgium	Belgium	Belgium
209	BUY	145	NUJN	145	Société Anonyme d'Armement, d'Industrie et Commerce, Antwerp	Japan	Japan	Japan	Japan
210	NIZD	300	GZBTQ	100-150	Nihon Kaiji Kogyo Kaisha	Greece	Greece	Greece	Greece
211	ARC	300	ARC	300	P. Pantaleon Fils, Piraeus	United States of America	United States of America	United States of America	United States of America
212	JRN	300	KFQ	300	Standard Oil Company	Great Britain	Great Britain	Great Britain	Great Britain
213	ILR	300	NACS	300	Société des Acieries de Paris et d'Outreau, Paris	United States of America	United States of America	United States of America	United States of America
214	MYE	300	MHR	300	Navy	United States of America	United States of America	United States of America	United States of America
215	OWI	300	OWI	300	U.S. Shipping Board, Washington (D.C.)	United States of America	United States of America	United States of America	United States of America
216	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
217	OWI	300	OWI	300	(Armateurs) Milberg & Co., Christiania	United States of America	United States of America	United States of America	United States of America
218	OWI	300	OWI	300	Federal S.S. Corporation, New York (N.Y.)	United States of America	United States of America	United States of America	United States of America
219	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
220	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
221	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
222	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
223	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
224	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
225	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
226	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
227	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
228	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
229	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
230	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
231	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
232	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
233	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
234	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
235	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
236	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
237	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
238	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
239	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
240	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
241	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
242	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
243	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
244	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
245	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
246	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
247	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
248	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
249	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
250	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
251	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
252	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
253	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
254	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
255	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
256	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
257	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
258	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
259	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
260	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
261	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
262	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
263	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
264	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
265	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
266	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
267	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
268	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
269	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
270	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
271	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
272	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
273	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
274	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
275	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
276	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
277	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
278	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
279	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
280	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
281	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
282	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
283	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
284	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
285	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
286	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
287	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
288	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
289	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
290	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
291	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
292	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
293	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
294	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
295	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
296	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
297	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
298	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
299	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America
300	OWI	300	OWI	300	Navy	United States of America	United States of America	United States of America	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Ozarda ¹⁹	GNZ	140	—	300, 600	P G	X	0.40	—	Great Britain
Ozark ¹⁰²	NHH	—	—	300, 600	P G	N	—	—	United States of America
Ozaukee ⁸⁷	WXAA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Ozette ¹⁰³	KEVP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Pachet ⁸⁷	KDCH	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Pacific KDZV	KDZV	—	Argonaut S.S. Company	300, 600	P G	X	—	—	United States of America
Pacific OIG ⁴⁰	OIG	250	Aktieselskabet Det Oversøiske Compagnie, Copenhagen	300, 450, 600	P	X	— ³⁸	— ³⁸	Denmark
Pacific OZI ¹	OZI	250	Aktieselskabet Det Store Nordiske Telegrafelskab, Copenhagen	300, 600	P	X	— ³⁸	— ³⁸	Denmark
Pacific SFZ ¹	SFZ	350	Rederiktslaget Nordstjernan (Johnson Line), Stockholm, Sweden and Norway-Brazil-Uruguay - Argentine-Chile-Peru and Coast of the Northern Pacific Line	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Pacific AQAD ¹	AQAD	400	(Armateur) Vilhelm Torkildsen, Bergen	300, 450, 600	P G	X	0.40	4.00	Norway
Pacific Maru ¹	JPE	400	Kawasaki Zosenjo	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Pacific Transport ¹⁰	ZED	145	—	300, 600	P G	X	0.40	—	Great Britain
Pacificque ¹	FNW	300	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	— ²⁷	0.40	—	France
Pacuare ¹⁹	MLY	150	—	300, 600	P G	X	0.40	—	Great Britain
Padusay ⁸⁷	KUOG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Padova ¹⁷	IUT	190	Esercizio Navigazione di Stato, Rome	300, 600	P G	X	0.40	—	Italy
Padua ¹⁹	GCVZ	—	—	300, 600	P G	X	0.40	—	Great Britain
Padurah ¹⁰²	NOG	—	—	300, 600	P G	N	—	—	United States of America
Pagasset ⁸⁷	KDHG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radio-telegram.	
Panama Transport ¹⁹	ZDV	160	—	300, 600	P G	X	0.40	—	Great Britain
Pau America ¹⁷	KDWZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	N	0.40	—	United States of America
Pan American ^{9 131}	KUT	150	Texas S.S. Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Panay ²	KEMJ	300	Madrigal & Co., Manila (Philippine Islands)	300, 450, 525, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Pancras ¹⁹	MDI	155	Navy	300, 600	P G	X	0.40	—	Great Britain
Pandora	GEXD	—	Navy	—	P G	—	—	—	Great Britain
Pangbourne GFES	GFES	—	—	—	P G	—	—	—	Great Britain
Pangbourne OCL ¹⁹	OC	150	—	300, 600	P G	X	0.40	—	Great Britain
Pangin ⁴¹	CUX	100-150	—	300, 600	P G	N	0.40	4.00	Portugal
Pantomia ¹⁹	MNA	250	—	300, 600	P G	N	0.40	—	Great Britain
Panoli ^{9 131}	KUQC	—	Pan-American Petroleum & Transport Co., Incorp., 1015, Security Building, Los Angeles (Cal.)	300, 600	P G	X	0.40	—	United States of America
Panola ¹⁰³	WMUO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Pansa	KUZN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	0.40	—	United States of America
Pansy	VWCP	150	Commissioners for the Port of Calcutta despatch vessel	300, 450, 600, 800	P	—	—	—	India
Panter	PBS	—	Navy	600	O ³⁹	—	—	—	Holland
Pantera	IAAV	—	Navy	—	—	—	—	—	Italy
Panther AKZ ¹	AKZ	—	Navy	—	O	N	—	—	Germany
Panther ⁹⁹	NOJ	—	Navy	—	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Panthere ¹	PBA	180	Tristan (Armateur), Lorient	300, 600	P G	X	0.40	—	France
Panthir	SYP	—	Navy	300, 600	P G	N	0.40	—	Greece
Pantias Rallis ¹	SWB	100-150	Panhellénique Steam Navigation Co.	300, 600	P G	N	0.40	4.00	Greece
Panuco KMM ^{9 131}	KMM	300	Sinclair Navigation Co., 120, Broadway, New York	300, 450, 600	P G	X	0.40	—	United States of America
Panuco KWM ¹⁰³	KWM	250	New York and Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Pao	FBPN	—	Navy	300, 800	P G	N	0.05	—	France
Paparoa ¹⁹	MHV	230	(Armateurs) Fearnley & Eger, Christiania	300, 600	P G	X	0.40	—	Great Britain
Papelera ¹	TTN	150-200	—	300, 600	P G	X	0.40	4.00	Norway

Pará AVG ¹	..	..	AVG	Day 350-700 Night 700-	(Armateurs) J. Ludwig Mowinkels Rederi A/S, Bergen	300, 450, 600	P G	X	0.40	4.00	Norway
Pará SNE ¹⁵	..	..	SNE	1,400	Navy	300	O ¹⁶	—	0.40	—	Brazil
Pará SRQ ¹⁵	..	..	SRQ	60	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Paraguay ^{9 121}	..	..	KT	150	Sun Company, Finance Building, Philadelphia (Pa.)	300, 600	P G	X	0.40	—	United States of America
Parahyba	..	..	GCSP	250	Navy	300, 600	P G	X	0.40	—	Great Britain
Parahyba	..	..	SOP	60	Navy	300	O ¹⁶	—	0.40	—	Brazil
Paraiso ²	..	..	WRI	200	Oliver J. Oliver	300, 600	P G	X	0.40	—	United States of America
Paralos ¹	..	..	THJ	150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G	X	0.40	4.00	Greece
Parana ⁴⁰	..	..	—	—	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	—	—	—	—	—	Denmark
Parana DXZ ³⁵	..	..	DXZ	200	Navy	300, 600	P G	X	0.40	4.00	Germany
Parana GBPC ¹⁰	..	..	GBPC	150	Navy	300, 600	P G	N	0.40	—	Great Britain
Parana LKM ¹	..	..	LKM	—	Navy	450, 600	O	N	—	—	Argentine Republic
Parana SNH	..	..	SNH	60	Navy	300	O ¹⁶	—	0.40	—	Brazil
Parattah ¹	..	..	VKU	200	Navy	300, 600	P G	—	0.40	—	Australian Commonwealth
Paro ¹⁹	..	..	GPV	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	Great Britain
Paria ^{9 121}	..	..	KOKQ	300	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 450, 600	P G	X	0.40	—	United States of America
Parina ²¹	..	..	CJX	250	(Armateurs) Fred Olsen & Co., Christiania	300, 600, 800	P G	N	0.40	—	Canada
Paris AQAO ¹	..	..	AQAO	150-175	Navy	300, 600	P G	—	0.40	4.00	Norway
Paris FASP	..	..	FASP	—	Compagnie Générale Transatlan- tique, Paris	300, 800	P G	N	0.05	—	France
Paris FGG ¹	..	..	FGG	400	London, Brighton & South Coast Railway Co.	300, 600	P G	X	0.40	—	France
Paris GBJZ ²¹	..	..	GBJZ	120	Nicola's, Mihanovich Compania, Ltd., Buenos Aires	300, 600	P G	N	0.10 ⁸²	1.00 ⁸²	Great Britain
Paris LQM ¹	..	..	LQM	135	F. Leyland & Co., Ltd.	300, 800	P G	N	0.40	4.00	Argentine Republic
Paris City ¹⁹	..	..	GDPR	220	Navy	300, 800	P G	X	0.40	—	Great Britain
Parisian	..	..	VRI	200	Navy	300, 600	P G	N	0.40	—	British West Indies
Parisiana ¹⁹	..	..	GDSY	—	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Paris Maru ¹	..	..	JATA	400	United Fruit S.S. Corporation	300, 600	P G	—	0.40	—	Japan
Parissima ⁹⁸	..	..	KDG	250	Navy	300, 600	P G	N	0.40	—	United States of America
Parker ²⁵	..	..	NIX	—	Maatschappij Stoomschip Park- haven, Rotterdam	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Parkhaven ¹	..	..	TYL	150	Navy	300, 600	P G	X	0.40	4.00	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimump Radio-telegram.	
Parksville ^{9 131}	KIZG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Parktown ¹⁹	ZYF	—	—	300, 600	P G	X	0.40	—	Great Britain
Parmahya ¹⁵	STP	60	Lage & Irmãos, Rio de Janeiro	300, 600	P G	N	4.00	—	Brazil
Parramatta	GABS	—	.. ..	—	—	—	—	—	Australian Commonwealth
Parrott ¹⁰³	NUPD	—	—	300, 600	P G	N	—	—	United States of America
Parthenia ¹⁹	ZXJ	170	—	300, 600	P G	X	0.40 ⁸⁷	—	Great Britain
Partridge GDTS ¹⁹	GDTS	125	—	300, 600	P G	X	0.10 ⁸⁷	—	Great Britain
Partridge NJG ⁴⁹	NJG	—	.. ..	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Pasadena ¹⁰³	KMEU	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Pas-de-Calais ^{53 1}	FZP	200	Société Anonyme de Gérance et d'Armement, Paris	300, 600	P G	N	0.15	—	France
Pasha ¹⁹	MZZ	—	—	300, 600	P G	X	0.40	—	Great Britain
Passaic Bridge ⁹⁷	KIBJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Pastores ⁹⁸	KLA	300	United Fruit S.S. Corporation	300, 600	P G	N	0.40	—	United States of America
Patagonia ¹	LLV	—	—	300, 600	O	N	—	—	Argentine Republic
Patagonier ¹⁰	ONP	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	N	0.40	—	Belgium
Patani ¹⁹	ZIL	200	—	300, 600	P G	N	0.40	—	Great Britain
Patapsco ⁹⁹	NOL	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Pathan MDV ¹⁹	MPV	140	—	300, 600	P G	X	0.40 ¹¹²	—	Great Britain
Pathan VWBZ ²	VWBZ	—	Royal Indian Marine Ship	—	O	X	0.40	—	India
Pathfinder NLJ ¹⁰³	NLJ	—	—	300, 600	P G	N	—	—	United States of America
Pathfinder VGJP ²¹	VGJP	150	James Playfair, Midland, Ontario	300, 600	P	— ⁸⁷	—	—	Canada
Patia ¹⁹	GDCV	—	—	300, 600	P G	X	0.40	—	Great Britain
Pato (El) ¹⁹	GFRV	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Patoka ⁹⁹	NUGN	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Patrao Lopes	CTS	100-150	Navy	300, 600	O	—	—	—	Portugal
Patras ¹⁷	IWF	140	De Negri Angelo, Camogli	300, 600	P G	X	0.40	—	Italy
Patria CTZ	CTZ	100-150	Navy	300, 600	O	—	—	—	Portugal
Patria FJP ¹	FJP	300	Compagnie Française de Navigation à Vapeur, Cyprien Fabre & Cie., Marseilles	300, 600	P G	N	0.40	—	France

Shipboard Stations

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	LKV PFT	Day Night	Navy Stoomvaart Maatschappij Rotterdam damsche Lloyd, Rotterdam	450, 600 300, 600, 1,800	O P G	N 0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200		Argentine Republic Holland
Patria LKV ¹ Patria PFT ¹	1,000 500	....	....	....	....	....	....
Patria PWJ ¹ Patria KDTX ² Patria SHW ¹	150 200	......	......	......	......	......	......
Patrician BDI ¹⁹ Patrician GCPA ¹⁹	140 —	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Patrick Henry ^{9 131}	..	300	..	..	..	..	..	..
Patrick Stewart Patrie FAGP	100 —	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Patrie FHX ¹ Patriot	200 —	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Patriot ¹⁹ Paris ¹	150 140	....	....	....	....	....	....
Patroclus ¹	..	150	..	..	..	..	..	..
Patrol KIN ^{9 131}	..	—
Patrol MEM ⁷¹	..	140	..	..	..	..	..	..
Patterson ⁹⁹	..	—
Pauca ¹⁹ Patuxent ⁹⁹	200 —	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Paul-Chailley Paulding ⁹⁹	— —
Paul Hamilton ⁹⁹	..	—
Paul H. Harwood ^{9 131}	..	300	..	..	..	..	..	..
Paulina ¹	..	150	..	..	..	..	..	..
Paul Jones ¹⁰² Paul Lecat ¹	300 —	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Paulownia Paul Paix ¹⁰	— 145	....	....	....	....	....	....
Paulsboro ^{9 131}	..	300	..	..	..	..	..	..
Pavia ¹⁹ Pawlet ^{9 131}	170 300	....	....	....	....	....	....

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radiogram.	
Pawnee ¹³¹	..	200	U. S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Pawtucket ⁹⁷	..	300	U. S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Pax ¹	..	100	Zarazul, Rodrigo y Saracho, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Pays de Liège ¹⁴	..	200	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Pays de Waes ¹⁹	..	240	—	300, 600	P G	X	0.40	—	Great Britain
Paz (La) ⁵⁰	..	300	—	300, 450, 600	P G	X	0.40	—	Great Britain
P. Claris ¹	..	150	Hijos de Jose Taya, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Peacock KDKV ⁹⁷	..	—	U. S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Peacock NIKD ⁹⁹	..	—	Navy	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Pear Branch ⁵⁰	..	350	United States Mexican Oil Corp.,	300, 450, 600	P G	X	0.40	—	Great Britain
Pearldon ⁹⁷	..	300	26, Beaver Street, New York	300, 450, 600	P G	X	0.20	—	United States of America
Pearleaf ¹⁹	..	210	—	300, 600	P G	X	0.40	—	Great Britain
Pearlhead ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Pearl Shell ¹³¹	..	300	Pearl Shell S. S. Co., 343, Sansome Street, San Francisco (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
Pearry ¹⁰²	..	—	Navy	300, 600	P G	N	—	—	United States of America
Peau-Rouge	..	200	Transports Maritimes de l'Etat	300, 800	P G	N	0.05	—	France
Pecheur ¹	..	—	Fleeton (Va.)	300, 600	P G	X	0.40	—	United States of America
Peconic ²	..	140	C. E. Davis Packing Company, Fleeton (Va.)	300, 450, 600	P R	X	—	—	United States of America
Pecos ⁹⁹	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Peder Skram ¹	..	—	Navy	600	O ³⁹	X	—	—	Denmark
Pedro Christophersen ¹	..	350	Roderiktiebolaget Nordstjarn (Jonson Line), Stockholm, Sweden and Norway-Brazil-Uruguay-Argentine and West Coast of South and North America Line	300, 600	P	—	0.40	4.00	Sweden
Pedro Nunes	..	100-150	Navy	300, 600	O	—	—	—	Portugal
Pedrosa ¹	..	150	Compañia Vasco-Cantabrica de Navegacion, Bilbao	300, 600	P G	N	0.30	3.00	Spain

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Peniche ⁶¹	CSX	100-150	—	300, 600	P G	N	0.40	4.00	Portugal
Peninnis ⁷¹	GFVK	—	Operated by the Isles of Scilly Steamship Co., Ltd., Old Town, St. Mary's, Isle of Scilly	300, 600	P G	X	0.10 ⁸²	1.00 ⁸²	Great Britain
Peninsular ⁶¹	CSR	100-150	—	300, 600	P G	N	0.40	4.00	Portugal
Peninsula State ⁸⁷	KDWS	500	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	N	0.40	—	United States of America
Penmorvah ¹⁹	ZXN	200	—	300, 600	P G	X	0.40	—	Great Britain
Penmunt ¹⁹	XPH	125	—	300, 600	P G	X	0.40	—	Great Britain
Pennant ^{9 131}	KME	200	Pierce Oil Corporation, 25, Broad Street, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Pennsylvania KUP ¹⁰³	KUP	300	Texas S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Pennsylvania NCE ⁹⁹	NCE	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Pennsylvania OIQ ⁴⁰	OIQ	200	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Pennsylvanian ¹⁴⁴	WKP	200	Amer-Hawaiian S.S. Co., 8, Bridge Street, New York (N.Y.)	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Pennyworth ¹⁹	ZPL	180	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Penolscoot NOE ⁹⁹	NOE	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Penolscoot WXOI ^{9 131}	WXOI	200	Penolscoot S.S. Company	300, 600	P G	X	0.40	—	United States of America
Penolver ¹⁹	YXT	170	—	300, 600	P G	X	0.40	—	Great Britain
Penpol ¹⁹	GBLT	—	—	300, 600	P G	X	0.40	—	Great Britain
Penrhos ¹⁹	YKW	—	—	300, 600	P G	X	0.40	—	Great Britain
Penrhydd ¹⁹	EXY	—	—	300, 600	P G	X	0.40	—	Great Britain
Penrhy's ¹⁹	MXH	—	—	300, 600	P G	X	0.40	—	Great Britain
Penrith Castle ⁵⁰	GJCZ	100	—	300, 450, 600	P G	X	0.40	—	Great Britain
Penrose ¹⁹	ZWU	155	—	300, 600	P G	X	0.20 ¹¹¹ 0.40	—	Great Britain
Pensacola NGN ⁹⁹	NGN	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Pensacola OED ¹⁹	OED	120	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain

Country	Line	Class	Capacity	Speed	Route	Company	Port of Origin	Port of Destination	Remarks
Pensilva ¹⁹	YMZ	..	140	..	..	..	..	..	Great Britain
Pentiff ¹⁹	GBYM	..	—	..	..	..	..	..	Great Britain
Pentakota ¹⁹	ZSN	..	170	..	..	..	..	..	Great Britain
Pentefif ¹⁹	GEXM	..	—	..	..	..	..	..	United States of America
Peoria ¹⁹	NOW	..	—	..	..	..	..	..	United States of America
Pepe	IFB	..	—	..	..	..	..	..	Italy
Pepe Caragol	PWJ	..	—	..	..	..	..	..	Cuba
Pequonnock ^{9 131}	KXP	..	75	..	..	..	..	..	United States of America
Pequot NUPJ ¹⁰²	NUPJ	..	—	..	..	..	..	..	United States of America
Pequot WLX ⁹⁷	WLX	..	150	..	..	..	..	..	United States of America
Peralta	KDMJ	..	—	..	..	..	..	..	United States of America
Pere-Neige	FAPX	..	—	..	..	..	..	..	France
Percival ⁹⁹	NIFJ	..	—	..	..	..	..	..	United States of America
Perdrix	FAOJ	..	—	..	..	..	..	..	France
Pere Marquette ^{9 111}	WDA	..	150	..	..	..	..	..	United States of America
Pere Marquette ^{8 121}	KINL	..	150	..	..	..	..	..	United States of America
Pere Marquette ^{17 9 131}	WDC	..	150	..	..	..	..	..	United States of America
Pere Marquette ^{18 9 131}	WDD	..	150	..	..	..	..	..	United States of America
Pere Marquette ^{19 9 131}	WDB	..	150	..	..	..	..	..	United States of America
Pere Marquette ^{20 9 131}	WDE	..	150	..	..	..	..	..	United States of America
Perfection ^{9 131}	KTN	..	150	..	..	..	..	..	United States of America
Pergamos	SYJ	..	—	..	..	..	..	..	Greece
Perim ¹⁹	GBKD	..	—	..	..	..	..	..	Great Britain
Period ¹	VXC	..	300	..	..	..	..	..	Australian Commonwealth
Peris Valero ¹	HLO	..	150	..	..	..	..	..	Spain
Pertia ³⁵	DPR	..	200	..	..	..	..	..	Germany
Perkins ⁹⁹	NOX	..	—	..	..	..	..	..	United States of America
Peronne	FAPE	..	—	..	..	..	..	..	France
Pérou ¹	FTP	..	250	..	..	..	..	..	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiotelegram.	
Perry ¹⁰²	300, 600	P G	N	—	—	United States of America
Persco ¹⁷	..	190	—	300, 600	P G	X	0.40	—	Italy
Perseveranza ¹⁷	..	140	Società Navigazione Ligure, di Armamento, Genoa	300, 600	P G	X	0.40	—	Italy
Persia ¹⁷	..	140	Perseveranza, Società Anonima di Navigazione à Vapore, Trieste	300, 600	P G	X	0.40	—	Italy
Persia Maru ¹	..	400	Lloyd Triestino Società di Navigazione à Vapore, Trieste	300, 600	P G	X	0.40	—	Italy
Persian ¹⁰³	..	150	Toyō Kisen Kaisha (Oriental Steamship Company)	300, 600, 1,800	P G	N	0.40	—	Japan
Persiana ¹⁹	Merchants and Miners Transportation Co., Light and German Street, Baltimore (Md.)	300, 450, 600	P G	N	0.40	—	United States of America
Persian Prince ¹⁰	—	300, 450, 600	P G	X	0.40	—	Great Britain
Persic ¹⁰	..	250	—	300, 600	P G	X	0.40	—	Great Britain
Persier ¹⁰	..	150-200	Lloyd Royal Belge, Antwerp	300, 600	P G	X	0.40	—	Great Britain
Perth EWC ¹⁰	..	130	—	300, 600	P G	X	0.40	4.00	Belgium
Perth TUU ¹	..	200-250	(Amateurs) Johan Rasmussen & Alexandre, Sandefjord	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Perth VIV ¹	..	300	—	300, 600	P G	X	0.40	4.00	Norway
Perthshire ⁷¹	Operated by the Admiralty Navy	—	O ⁸⁸	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Pertuisane	300, 800	P G	N	—	0.65	Great Britain
Peru GBRV ¹⁰	..	200	—	300, 600	P G	N	0.40	—	France
Peru OZA ¹⁰	..	250	Aktieselskabet det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Great Britain
Peruviana ¹⁰	—	300, 450, 600	P G	X	0.40	—	Denmark
Peshawar ¹⁰	—	300, 600	P G	X	0.40	—	Great Britain
Pestel	..	300-550	Crowell & Thurlow S.S. Co., 131 State Street, Boston (Mass.)	300, 600	P G	X	0.40	—	Russia
Peter H. Crowell ²	..	200	Pugor Steam Tug Boat Co., Seattle (Wash.)	300, 450, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Peter Reiss ¹⁰¹	..	150	Walker Building, Seattle (Wash.)	300, 600	P G	X	0.40	0.50	United States of America

Line	Company	Class	Port of Origin	Port of Destination	Rate	Remarks
1	Petersfield	GFET	—	Navy	300, 600	Great Britain
2	Peterson	ETZ	160	Chicago and S. Haven S.S. Co.	300, 600	United States of America
3	Peterson	YGV	150	Chicago (Ill.)	300, 600	United States of America
4	Peterson	WDH	150	Navy	600, 800	France
5	Peterson	FAPZ	—	—	300, 450, 600	Great Britain
6	Peterson	GFLN	105	—	300, 600	Great Britain
7	Peterson	BUF	150	—	300, 600	Denmark
8	Peterson	OIVA	150	Aktieselskabet det Danske Petro-	300, 600	Denmark
9	Peterson	ZYK	160	leums-Aktieselskab, Copenhagen	300, 600	Great Britain
10	Peterson	XIH	130	—	300, 600	Great Britain
11	Peterson	FBPL	150	—	300, 800	France
12	Peterson	HEH	150	Stoomvaart Maatschappij Oostzee	300, 600	Holland
13	Peterson	XXK	130	Amsterdam	300, 600	Great Britain
14	Peterson	DRN	200	—	300, 450, 600	Germany
15	Peterson	ALE	—	—	300, 450, 600	Germany
16	Peterson	GBWY	—	—	300, 450, 600	Great Britain
17	Peterson	YOT	200	—	300, 600	Great Britain
18	Peterson	KDA	300	—	300, 450, 600	United States of America
19	Peterson	KSM	200	Atlantic & Caribbean Steam Navi-	300, 600	United States of America
20	Peterson	PUU	100	gation Co. (Redd Line), 82, Wall	300, 600	Brazil
21	Peterson	GCMJ	—	Street, New York (N.Y.)	300, 600	Great Britain
22	Peterson	NEDG	—	New York-Naples S.S. Company	300, 600	United States of America
23	Peterson	WAV	300	—	300, 600	United States of America
24	Peterson	KDEW	150	—	300, 450, 600	United States of America
25	Peterson	VGNL	800	—	300, 450, 600	Canada
26	Peterson	GCYS	250	—	300, 450, 600	Great Britain
27	Peterson	FDP	150	—	300, 600	France
28	Peterson	OCN	140	—	300, 600	Great Britain
29	Peterson	FIR	300	—	300, 600	France
30	Peterson	WJEO	300	—	300, 600	Great Britain
31	Peterson	WFOU	300	—	300, 600	United States of America
32	Peterson	OOX	100-150	—	300, 600	United States of America
33	Peterson	DPX	200	—	300, 450, 600	Belgium
34	Peterson	OZO	200	—	300, 450, 600	Germany
35	Peterson	YCY	160	—	300, 600	Denmark
36	Peterson	HGX	—	—	300, 600	Great Britain
37	Peterson	EST	170	—	300, 600	Siam
38	Peterson	FPJ	250	—	300, 600	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Phryné ¹ ..	UGR	200	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G ..	X	0.40	—	France
Phyllis Seed ¹⁹ ..	GJLC	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Physa ¹⁸ ..	EVW	190	—	300, 600	P G ..	X	0.40	—	Great Britain
Piako ¹⁹ ..	GBYP	250	—	300, 600	P G ..	X	0.40	—	Great Britain
Piauly ..	SOY	60	Navy	300	O ¹⁸	—	0.40	—	Brazil
Piave ¹⁵ ..	PVJ	250	Companhia Lloyd Nacional, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Piave II ¹⁷ ..	IEL	190	Navigazione Generale Italiana, Genoa	300, 600	P G ..	X	0.40	—	Italy
Piave III ¹⁷ ..	USZ	190	Navigazione Libera Triestina, Trieste	300, 600	P G ..	X	0.40	—	Italy
Piave IVX ¹⁷ ..	IVX	190	Società Anonima Spaichi Imbaichi e Transports, Milan	300, 600	P G ..	X	0.40	—	Italy
Picardier ¹⁰ ..	OTP	100-150	Lloyd Royal Belge, Antwerp	300, 600	P G ..	X	0.40	4.00	Belgium
Picorre ¹ ..	FBR	200	Société Anonyme les Chalutiers de La Rochelle, La Rochelle	300, 600	P G ..	X	0.40	—	France
Piedrabuena ¹ ..	IMB	—	—	300, 450, 600	O	N	—	—	Argentine Republic
Pienonte ¹⁷ ..	INX	140	Navigazione Orientale, Naples	300, 600	P G ..	X	0.40	—	Italy
Pierre Andre ¹ ..	UJP	180	Francoise Fourny, Fils & Cie. (Armateurs), Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	France
Pierre Durand ..	FAXU	—	Navy	600, 800	P G ..	N	0.05	—	France
Pierre Loti ¹ ..	FMH	400	Société des Services Contractuels des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G ..	X	0.40	—	France
Pierre Marrast ..	FALM	—	Navy	600, 800	P G ..	N	0.05	—	France
Pieter de Coninck ¹ ..	OPK	100-150	Government	300, 600	P G ..	N ¹³	0.40 ¹¹	4.00 ¹¹	Belgium
Pietro Gori ¹⁷ ..	ILP	100	Cooperativa Garibaldi, Società Anonima Cooperativa Fra Lavoratori Del Mare, Genoa	300, 600	P G ..	X	0.40	—	Italy
Pigeon FAOP ..	FAOP	—	Navy	300, 800	P G ..	N	0.05	—	France
Pigeon NIKF ..	NIKF	—	Navy	300, 600	P G ..	N	0.40 ¹¹¹	—	United States of America
Pijnacker Hordijk ¹ ..	PKP	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G ..	— ⁴⁴	0.40 ¹¹²	4.00	Dutch East Indies

Ship	Lat	Long	Company	Port	Passenger	Mail	Country
Pike Pool ¹⁰	..	..	William L. Elkins	..	300, 600	P G	Great Britain
Pilar de Larrinaga ¹⁰	..	..	Chicago, Racine and Milwaukee S.S. Company	..	300, 600	—	United States of America
Pilgrim KFAH ¹⁰	150	..	Lloyd Triestino Società di Navigazione a Vapore, Trieste	..	300, 600	P G	United States of America
Pillsbury ¹⁰²	..	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Italy
Pilsna 17 ^{..}	140	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Great Britain
Pilton 19^{..}	..	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Italy
Pinar del Rio ¹⁰	..	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	United States of America
Pincio 17 ^{..}	100	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Great Britain
Pinellas ¹⁰³	300	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Great Britain
Pinemoor ¹⁹	135	..	U.S. Shipping Board, Washington (D.C.)	..	300, 600	P G	Great Britain
Pine Tree State	300	..	U.S. Shipping Board, Washington (D.C.)	..	300, 450, 600, 1,800	P G	United States of America
Pingouin	..	..	Navy	..	600, 800	P G	France
Pinos SYK	..	..	Navy	..	600, 800	O	Greece
Pinos TGC ¹	100-150	..	The Hellenic Co. of Maritime Enterprises, Piraeus	..	300, 600	P G	Greece
Pinna 19^{..}	..	..	Navy	..	300, 450, 600	P G	Great Britain
Pinnau ³⁵	..	..	Navy	..	300, 600	P G	Germany
Pinola ⁹⁹	..	..	Navy	..	300, 600	P G	United States of America
Pinot 19^{..}	..	..	Navy	..	300, 600	P G	Great Britain
Pinta ²	..	..	Navy League of Canada, Toronto (Ont.)	..	300, 600	O	Canada
Pintade	..	..	Navy	..	300, 600	P G	France
Pionbino ¹⁷	190	..	Lloyd del Mediterraneo Società di Navigazione, Rome	..	300, 600	P G	Italy
Pioneer KIG ^{9 121}	300	..	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	..	300, 450, 600	P G	United States of America
Pioneer KUSS ²	..	..	Steward Packing Company	..	300, 600	P G	United States of America
Pioneer NIL ¹⁵	300	..	Owned, and accounts settled, by Western Pacific High Commission, Suva	..	300, 600	P G ¹²	United States of America
Pioneer VRL	90	..	Puget Sound Tug Boat Company, Walker Building, Seattle (Wash.)	..	300, 600	P G	Fiji Islands
Pioneer WPN ²	100	..	Lloyd Royal Belge, Antwerp	..	300, 600	P G	United States of America
Ponier ¹⁰	150-200	..	U.S. Shipping Board, Washington (D.C.)	..	300, 450, 600	P G	Belgium
Pipestone County ¹²³	300	..	Navy	..	300, 450, 600	P G	United States of America
Pisa	..	..	Borquez & Cia., Calle Blanco, tobi Valparaiso	..	300, 600	P G	Chile
Pisagua ¹	250	..	Navy	..	300, 600	P G	United States of America
Piscataqua ²⁹	..	..	Transports Maritimes de l'Etat	..	300, 600	P G	France
Pisco HVZ ¹	350	..	Transports Maritimes de l'Etat	..	300, 600	P G	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per World	Minimum Radiotelegram.	
Pisco KEQV ¹⁹	KEQV	—	U.S. Shipping Board	300, 600	P G	X	0.20	—	United States of America
Pittsburgh GFIS ¹⁹	GFIS	—	Navy	300, 450, 600	P G	N	0.40 ¹¹¹	—	Great Britain
Pittsburgh NOT ¹⁹	NOT	—	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Pittsburgh Bridge ¹⁹ 131	KUKL	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40 ¹¹²	—	United States of America
P. J. Rully ¹⁰³	KDMY	150	National Oil & Transport Co., Orange (Texas)	300, 450, 600	P G	X	0.40	—	United States of America
Placentia (La) ¹²¹	KDPX	300	Union Oil Company	—	P G	X	0.40	—	United States of America
Pladda ¹⁹	GFMB	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.10 ⁸⁷	—	United States of America
Plainfield ¹⁰³	WJEI	200	—	300, 600	P G	X	0.40	1.00 ⁸⁷	Great Britain
Planorbis ¹⁹	GFPL	—	—	300, 450, 600	P G	X	0.40	—	United States of America
Plassy ¹⁹	MNJ	250	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G	N	0.40	—	Great Britain
Plata FVL ¹	FVL	250	Navy	300, 600	P G	N	0.40	—	Great Britain
Plata LKQ (El) ¹	LKQ	—	Navy	450, 600	O	N	—	—	France
Plata LLC (La) ¹	LLC	—	Navy	450, 600	O	N	—	—	Argentine Republic
Platypus	GABT	—	—	—	—	—	—	—	Argentine Republic
Playa	KDTE	—	Union Oil Co.	300, 600	P G	—	—	—	Argentine Republic
Pleiades ¹⁷	WNP	300	Lukenbach Steamship Company	300, 450, 600	P G	X	—	—	Australian Commonwealth
Pleodon ¹⁹	GFLO	200	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 450, 600	P G	X	0.40	—	United States of America
P.L.M. ⁷	UHR	200	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	United States of America
P.L.M. ⁸	UHS	200	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	Great Britain
P.L.M. ¹⁰	UHT	600	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	France
P.L.M. ¹²	UJY	250	Société Nationale d'Afrique, 29, Quai Georges V, Le Havre	300, 450, 600, 800	P G	X	0.40	—	France
P.L.M. ¹³	UIG	250	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	France
P.L.M. ¹⁴	UIH	250	Société Nationale d'Afrique, 6, Rue du Vignon, Paris	300, 600	P G	X	0.40	—	France
P.L.M. ¹⁵	UII	300	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	France
P.L.M. ²⁰	UIB	300	Société Nationale d'Afrique, 38, Rue de Châteaudun, Paris	300, 600	P G	X	0.40	—	France

	UIJ	300	Société Nationale d'Affrètement, 38, Rue de Châteaudun, Paris	300, 450, 600, 800	P G	..	..	0.40	..	Light
P.L.M. 21 ¹	..	300	Société Nationale d'Affrètement, 38, Rue de Châteaudun, Paris	300, 450, 600, 800	P G	..	..	0.40	..	France
P.L.M. 22 ¹	..	300	Société Nationale d'Affrètement, 38, Rue de Châteaudun, Paris	300, 450, 600, 800	P G	..	..	0.40	..	France
P.L.M. 24 ¹	..	280	Société Nationale d'Affrètement, 29, Quai Georges V, Le Havre	300, 450, 600, 800	P G	..	..	0.40	..	Great Britain
Plover ¹⁰	..	—	—	300, 450, 600	P G	..	..	0.10 ⁸²	1.00 ⁸²	United States of America
Plow City ¹⁰⁰	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	0.40	—	Great Britain
Plucana ¹⁰	..	—	—	300, 450, 600	P G	..	..	0.40	—	Great Britain
Plum Branch ¹⁰	..	350	—	300, 450, 600	P G	..	..	0.40	—	Great Britain
Plum Leaf ¹⁰	..	210	—	300, 600	P G	..	..	0.40	—	Great Britain
Plutarch ¹⁰	..	155	(Armateurs) D/S A/S Pluto, Haugesund	300, 600	P G	..	..	0.40	—	Norway
Pluto ¹	..	100-150	Green Star Steamship Corporation, 120, Broadway, New York	300, 600	P G	..	..	0.40	4.00	United States of America
Plymouth ^{9 101}	..	300	New England S.S. Co., Fall River (Mass.)	300, 450, 530, 600	P G	..	..	0.40 ¹¹⁷	—	United States of America
Plymouth KXH ¹⁰³	..	100	Sicilia Società di Navigazione, Rome	300, 600	P G	..	..	0.40	—	Italy
Po ¹⁷	..	140	Barron G. Collier	300, 600	P G	..	..	0.20	—	United States of America
Pocantico ⁹⁷	..	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	..	..	0.40	4.00	United States of America
Poonet ¹	..	200	—	300, 600	P G	..	..	—	4.00	Holland
Poe ¹⁰²	..	—	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Hol-	300, 450, 600, 800	P G	..	..	0.30	—	Spain
Poeldijk ¹	..	200	land Amerika Lijn, Rotterdam	300, 600	P G	..	..	0.30	3.00	Spain
Poeta Arolas ¹	..	200	Compañia Transmediterranea, Bar-	300, 800	P G	..	..	0.05	—	France
Poeta Querol ¹	..	150	celona	300, 800	P G	..	..	0.40 ¹²²	—	United States of America
Pognard ¹	..	—	Compañia Transmediterranea, Bar-	300, 800	P G	..	..	0.40	—	United States of America
Point Adams ¹⁰¹	..	200	celona	300, 800	P G	..	..	0.40 ¹²²	—	United States of America
Point Arena ¹⁰³	..	250	Navy	300, 476, 600	P G	..	..	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Point Bonita ²	..	200	Pacific Mail S.S. Co., 508, Market Street, San Francisco (Cal.)	300, 600	P G	..	..	0.40 ¹²²	—	United States of America
Pointer ¹⁰	..	130	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	0.40 ¹²²	—	United States of America
Point Judith ¹⁰¹	..	200	Pacific Mail S.S. Co., 508, Market Street, San Francisco (Cal.)	300, 600	P G	..	..	0.40 ¹²²	—	United States of America
Point Lobos ¹⁰¹	..	200	Pacific Mail S.S. Co., 508, Market Street, San Francisco (Cal.)	300, 600	P G	..	..	0.40 ¹²²	—	United States of America
Point Loma ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	0.40	—	France
Poitou ¹	..	180	Véron & Cie., La Rochelle	300, 600	P G	..	..	0.40	—	Italy
Pola IKJ ¹	..	140	Navon	300, 600	P G	..	..	0.40	—	Great Britain
Pola INJ ¹⁷	..	250	Esercizio Navigazione di Stato, Rome	300, 600	P G	..	..	0.40	—	United States of America
Poland ¹⁰	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	0.40	—	United States of America
Polar Bear ¹⁰³	..	300	—	300, 600	P G	..	..	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Polarhavet ⁴⁰	..	250	Aktieselskabet Dampskibsselskabet Atlantehavet, Copenhagen	300, 450, 600 , 800	P G ..	X	0.40	4.00	Denmark
Polarine ^{9 121}	..	300	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Polaris ⁴⁰	..	200	Aktieselskabet Dampskibsselskabet Orion, Copenhagen	300, 450, 600 , 800	P G ..	X	0.40	4.00	Denmark
Polar Sea ^{9 121}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Polar Star ^{9 121}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Polariskelm ¹	..	250	Trunkaktiebolaget Grandsberg- Oxelösund, Stockholm	300, 600	P ..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	Sweden
Poleric ¹⁹	..	210	—	300, 600	P G ..	X	0.40	—	Great Britain
Polesnyi	..	100	—	300, 600	P G ..	X	0.40	—	Russia
Polesos ¹	..	100-150	G.G. Anghelatos, Piraeus.	300, 600	P G ..	X	0.40	4.00	Greece
Pojillo ¹⁰⁷	..	—	Philippine Insular Government ..	300, 600	P G ..	N	—	—	United States of America
Politician ¹⁰	..	155	(Armateurs) Winge & Co., Chris- tiana	300, 600	P G ..	X	0.40	—	Great Britain
Pojana ¹	..	100-150	Lloyd Sabauda, Società Anonima per Azioni, Genova	300, 600	P G ..	X	0.40	4.00	Norway
Pollenzo ¹⁷	..	190	Kon. Nederl. Stoomboot, Mij. ..	300, 600	P G ..	X	0.40	—	Italy
Pollox ¹	..	150	Compagnie Générale Transatlan- tique, Paris	300, 600	P G ..	X	0.40	—	Holland
Polo ¹⁹	..	135	—	300, 600	P G ..	X	0.40	—	Great Britain
Polegne ¹	..	150	—	300, 600	P G ..	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.40	—	France
Polonia ⁴⁰	..	350	Aktieselskabet det Ostasiatisko Kompani, Copenhagen	300, 450, 600 , 800	P G ..	N	0.40	4.00	Denmark
Polybius ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Polycarp ¹⁹	..	140	—	300, 600	P G ..	X	0.40	—	Great Britain
Polyktor ¹	..	150-200	Giorga Draculis, London ..	300, 600	P G ..	X	0.40	4.00	Greece
Polynea ^{9 121}	..	150	Pioneer S.S. Company ..	300, 600	P G ..	X	0.10 ¹¹⁹	—	United States of America
Polypheme	..	—	Navy ..	300, 800	P G ..	X	0.05	—	France
Polyphemus ²¹	..	170	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G ..	X	0.40	—	Great Britain

	DPO	KDAT	200	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Pomerni ³⁵	300	300	Société les Affreteurs, Réunion, Paris	300, 600	P G	X	0.40	France
Pomona ^{9 131}	300	300	Navy	300, 450, 600	O	N	0.20 ¹¹¹	Poland
Pomone ¹	—	—	Navy	300, 600	P G	N	0.40 ¹¹²	United States of America
Pomorianin	—	—	New York and Porto Rico S.S. Co., 11, Broadway, New York (N.Y.)	300, 450, 600	P G	N	0.40	United States of America
Pompey ⁵⁹	300	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	Italy
Ponce ¹⁰³	300	300	Navy	300, 600	P G	X	0.40	Germany
Pontia ¹⁰³	—	—	Cargadoors-en Scheepvaart-Kantoor Levant, Rotterdam	300, 600	P G	X	0.40	Holland
Pontiere	200	200	—	300, 600	P G	X	0.40	Australian Commonwealth
Pontos DXQ ³⁵	200	200	—	300, 600	P G	X	0.40	—
Pontos ¹	200	200	—	300, 600	P G	X	0.40	—
Poolta ¹	100	100	—	300, 600	P G	X	0.20 ⁸	—
									0.40 ⁵	—
Poona ¹⁹	190	190	—	300, 600	P G	X	0.40	Great Britain
Pope ¹⁰²	—	—	—	300, 600	P G	N	—	United States of America
Popi ¹	100-150	100-150	Epirotiki Steamship Co., Piraeus	300, 600	P G	X	0.40	Greece
Poplar Branch ¹⁹	160	160	—	300, 600	P G	X	0.40	Great Britain
Porjus ¹	250	250	Traaaktiebolaget Grandenburg, Oxelösund, Stockholm	300, 600	P	—	0.40	Sweden
Porsanger ¹	150-200	150-200	(Armateurs) Westfal, Larsen & Co., A/S Bergen	300, 600	P G	X	0.40	Norway
Porta ³⁵	200	200	—	300, 450, 600	P G	X	0.40	Germany
Port Adelaide ¹⁹	—	—	—	300, 600	P G	X	0.40	Great Britain
Port Albany ⁷¹	250	250	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	Great Britain
Port Alma ¹⁹	180	180	—	300, 600	P G	X	0.40	Great Britain
Port Auckland	—	—	—	300, 450, 600	P G	X	0.40	Great Britain
Port Augusta ¹⁹	150	150	—	300, 600	P G	X	0.40	Great Britain
Port Bowen ¹⁹	210	210	—	300, 600	P G	X	0.40	Great Britain
Port Campbell ¹⁹	—	—	—	300, 450, 600	P G	X	0.40	Great Britain
Port Caroline ¹⁹	—	—	—	300, 600	P G	X	0.40	Great Britain
Port Chalmers ¹⁹	220	220	—	300, 600	P G	X	0.40	Great Britain
Port Curtis ¹⁹	—	—	—	300, 600	P G	X	0.40	Great Britain
Port Darwin ¹⁹	150	150	—	300, 600	P G	X	0.40	Great Britain
Port-de-Boulogne ¹	180	180	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	France
Port Denison ¹⁹	150	150	—	300, 600	P G	X	0.40	Great Britain
Port Elliot ¹⁹	155	155	—	300, 600	P G	X	0.20 ¹¹¹	United States of America
Porter ¹⁹	—	—	Navy	300, 600	P G	N	0.40 ¹¹²	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Portfield ¹⁹	..	170	—	300, 600	P G	X	0.40	—	Great Britain
Portgwaer ¹⁹	..	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Port Hacking ¹⁹	..	200	—	300, 600	P G	X	0.40	—	Great Britain
Portia ¹⁹	..	200	—	300, 450, 600	P G	X	0.40	—	Great Britain
Portos ¹	..	300	Société des Services Contracteurs Des Messageries Maritimes, 9, Rue de Séze, Paris	300, 600	P G	— ¹²	0.40	—	France
Port Hunter ¹⁹	..	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Portia	..	—	—	—	—	—	—	—	Newfoundland
Port Kembla ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Portland Maru ¹	..	500	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Port Lincoln ²¹	..	250	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	N	0.40	—	Great Britain
Portloe ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Port Lyttelton ¹⁹	..	200	—	300, 600	P G	X	0.40	—	Great Britain
Port Macquarie ²¹	..	250	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 450, 600	P G	N	0.40	—	Great Britain
Port Melbourne ¹⁹	..	210	—	300, 600	P G	X	0.40	—	Great Britain
Port Napier ¹⁹	..	180	—	300, 600	P G	X	0.40	—	Great Britain
Port Nicholson ¹⁹	..	200	—	300, 600	P G	X	0.40	—	Great Britain
Porto ⁴¹	..	100-150	—	300, 600	P G	N	0.40	—	Portugal
Porto Alexandre ⁴¹	..	100-150	—	300, 600	P G	N	0.40	4.00	Portugal
Porto di Alessandretta ¹⁷	..	190	Marittima Italiana Società di Navigazione, per Servizi Postali, Genoa	300, 600	P G	N	0.40	4.00	Italy
Porto di Savona ¹²	..	190	Marittima Italiana, Società di Navigazione, per Servizi Postali, Genoa	300, 600	P G	N	0.40	—	Italy
Portola Phumas ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Porto Rico ^{9 131}	..	300	New York & Porto Rico S.S. Co. ..	300, 600	P G	N	0.40	—	United States of America
Portos ¹	..	250	Rederiaktiebolaget H. Modin, Stockholm	300, 600	P	0700 to 0800 1100 to 1200	0.40	4.00	Sweden

Shipboard Stations—Continued

Name	Call Signal	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Prah ¹⁹	ERW	220	—	300, 600	P G	X	0.40	—	Great Britain
Prabsu ¹⁹	ZMB	200	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Prairal ¹⁹	BAM	155	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Prairie ⁹⁹	NQM	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Prat	CAD	—	Navy	—	—	—	—	—	Chile
Preble ⁹⁹	NUNG	—	Navy	300, 600	P G	N	—	—	United States of America
Prenuda	IIQ	—	Navy	—	—	—	—	—	Italy
Preneste ¹⁷	UTB	190	Roma, Società di Navigazione, Roma	300, 600	P G	X	0.40	—	Italy
President Adams ¹⁰³	KDRL	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	N	0.40	—	United States of America
President Arthur ¹⁰³	WLS	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
President Bunge ¹⁰	OPB	100-150	Compagnie Royal Belge Argentina, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
President Cleveland ⁹⁷	KDCM	150-500	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	X	0.40	—	United States of America
President Fillmore ⁹⁷	KDCI	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
President Garfield ¹⁰³	KDTC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
President Harding ⁹⁷	KDWK	500	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
President Hayes ¹⁰³	KDLB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	N	0.40	—	United States of America
President Jackson ⁹⁷	KDPA	150-300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
President Jefferson ³²	KDOT	300-	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	N	0.10	—	United States of America
President Lincoln ⁹⁷	KDUY	500	United States Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G	N	0.40	—	United States of America

President McKinley ²⁷	KDSL	300	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G	N	0.40	United States of America
President Monroe ²⁷	KDAR	300	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G	N	0.40	United States of America
President Pierce ²²	KDNV	150- 1,000	(D.C.) U.S. Shipping Board, Washington	300, 450, 600, 1,800	P G	N	0.40	United States of America
President Polk ²⁷	KDOZ	300	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G	N	0.40	United States of America
President Taft ²⁷	KDWS	500	(D.C.) U.S. Shipping Board, Washington	300, 450, 600, 1,800	P G	N	0.40	United States of America
President Van Buren ^{9 121}	KDHF	300	(D.C.) U.S. Shipping Board, Washington	300, 450, 600	P G	N	0.40	United States of America
President Wilson ²⁷	KDSV	2,000	(D.C.) U.S. Shipping Board, Washington	300, 450, 600, 1,800	P G	N	0.40	United States of America
Presidente Mitre ¹	LRL	300	(D.C.) A. M. Defino y Hermano, Buenos Aires	300, 450, 600	P G	N	0.40	Argentine Republic
Presidente Quintana ¹	LRE	300	(D.C.) A. M. Defino y Hermano, Buenos Aires	300, 450, 600	P G	N	0.40	Argentine Republic
Presidente Wilson ¹⁷	IOB	270	(D.C.) Casulich, Società Triestina di Navigazione, Trieste	300, 450, 600	P G	X	0.40	Italy
Prestatyn	GFEV	—	Navy	—	P G	—	—	Great Britain
Preston ¹⁰²	NUNJ	—	—	300, 600	P G	N	—	United States of America
Pretorian ¹⁰	MFN	200	—	300, 600	P G	N	0.40	Great Britain
Preussen AMB ¹	AMB	—	Navy	—	O	N	—	Germany
Preussen DPC ^{27 1}	DPC	110	Preussische Eisenbahnverwaltung, Berlin	300, 375, 600	P R ²⁸	X	0.30	Germany
Preussen DPP ²⁵	DPP	200	Neue Dampfer Kompagnie, Stettin	300, 600	P G	X	0.25	Germany
Previsor ¹	TKH	100	La Previsora Naval, Bilbao	300, 600	P G	N	0.30	Spain
Prism ²¹	YTO	200	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	X	0.40	Great Britain
Price McKinney ^{9 121}	KDXR	150	Pioneer S.S. Company	300, 600	P G	X	0.10 ¹¹⁹	United States of America
Primauguet	FDPG	—	Navy	300, 800	P G	N	0.05	France
Primerio de Mayo ¹	LLW	—	Navy	450, 600	O	N	—	Argentine Republic
Primevere	FAPR	—	Navy	300, 800	P G	N	0.05	France
Primula INO ¹⁷	INO	140	Edoardo Mazza, Savona	300, 600	P G	X	0.40	Italy
Primula OYI ¹⁰	OYI	150	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 600	P G	X	0.40	Denmark
Prince Albert	VFL	100	Grand Trunk Pacific Development Co., Vancouver (B.C.)	300, 600, 800	P G	— ²⁷	0.40	Canada
Prince Arthur ²¹	VGJ	200	Boston & Yarmouth S.S. Co., Ltd., Montreal (P.Q.)	300, 600, 800	P G	— ²⁷	0.40	Canada
Prince George GBSD ²¹	GBSD	150	Grand Trunk Pacific Development Co., Ltd.	300, 600	P G	N	0.40	Great Britain
Prince George VGG ²¹	VGG	200	Boston & Yarmouth S.S. Co., Ltd., Montreal (P.Q.)	300, 600	P G	— ²⁷	0.40	Canada
Prince John ²	VFM	100	Grand Trunk Pacific Development Co., Vancouver (B.C.)	300, 600	P G	— ²⁷	0.40	Canada
Prince Rupert ²¹	GBTK	150	Grand Trunk Pacific Development Co., Ltd.	300, 600	P G	N	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Princesa ¹⁸	ZQE	150	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Princesa de Asturias Princess BJX ¹⁹	EBG BJX	324	Navy	300, 600	O	X	—	—	Spain Great Britain
Princess KGT ²⁰	KGT	200	Archibald M. Ostrom	300, 600	P G	X	0.20	—	United States of America
Princess Adelaide ²¹	VFA	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Alice ²¹	VFD	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Beatrice ²¹	VFC	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Charlotte ²¹	VFE	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Ena GDOX ¹⁹	GDOX	—	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	N	0.10 ⁴	1.00 ⁴	Great Britain
Princess Ena VFJ ²¹	VFJ	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Louise ²¹	VGNM	200	Coast S.S. Service, Victoria (B.C.)	300, 600	P G	— 27	0.20	—	Canada
Princess Maquima ²¹	VGJ	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Margaret	CFUM	—	Navy	—	P G	—	—	—	Great Britain
Princess Mary ²¹	VFB	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Mand ²¹	YXR	—	Operated by the Portpatrick and Wigtownshire Railway Joint Co., Stranraer	300, 600	P G	X	0.40	—	Great Britain
Princess May ²¹	VFH	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	N	0.40	—	Canada
Princess Patricia ²¹	VGZ	100	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Royal ²¹	VFG	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Victoria VGDS ²¹	VGDS	200	Canadian Pacific Railway S.S. Co., Montreal (P.Q.)	300, 600	P G	— 27	0.40	—	Canada
Princess Victoria ZTF ²¹	ZTF	—	Operated by the Portpatrick and Wigtownshire Railway Joint Co.	300, 600	P G	X	0.40	—	Great Britain

Line	Ship	Company	Port of Origin	Port of Destination	Agent	Class	Speed	Capacity	Remarks
100-150	Princesse Clémentine	OOP ¹⁰	Antwerp	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	11	Belgium
100-150	Princesse Clémentine	OPC	Antwerp	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	11	Belgium
100-150	Princesse Elizabeth	OPE	Antwerp	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	11	Belgium
300	Princeton	KST	Princeton	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 450, 600	4.00	11	United States of America
150	Principe de Asturias	TIB	Madrid	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Spain
150	Principe de Piemonte	TMQ	Turin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Spain
150	Principe de Viana	TMP	Turin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Spain
190	Principe di Udine	IYU	Trieste	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Italy
240	Principessa Maria	CVM	Genoa	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	600	3.00	30	Roumania
140	Principessa Jolanda	IOG	Genoa	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Italy
270	Principessa Mafalda	IYM	Genoa	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Italy
200	Prinkipo	DPK	Prinkipo	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	3.00	30	Germany
135	Prins Christian	OXG	Copenhagen	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 450, 600	4.00	38	Denmark
150	Prins der Nederlanden	PEN	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 450, 600, 800	4.00	40	Holland
350	Prins der Nederlanden	PFQ	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 450, 600, 800	4.00	40	Holland
150	Prins Frederick Hendrik	PEK	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Holland
150	Prins Hendrik	PDC	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Holland
150	Prinses Juliana	PDF	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Holland
225	Prinses Juliana	PFN	Amsterdam	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Holland
200	Prinz Adalbert	DPT	Berlin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Germany
60	Prinzessin Heinrich	DPD	Berlin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Germany
200	Prinz Sigismund	DPS	Berlin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Germany
200	Prinz Waldemar	DPW	Berlin	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Germany
150	Priscilla	RXI	San Francisco	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 450, 550	4.00	117	United States of America
200	Privall	DPL	Genoa	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Germany
190	Proclia	IZD	Genoa	Ocean	(Société et Anonyme Belge d'Armement et de Navigation, Antwerp)	300, 800	4.00	40	Italy

Providence	FJB ¹	FJB	300	Compagnie Française de Navigation à Vapeur Cyprien Fabre & Cie, Marseilles	300, 600	PG	X	0.40	France
Providence KXJ ¹⁰³	..	KXJ	150	New England S.S. Co., Fall River (Mass.)	300, 450, 550, 600	PG	X	0.40 ¹¹⁷	United States of America
Providence ¹	..	UIX	100	Compagnie du Boleo, 56, Rue de Provence, Paris	300, 600	PR ⁶⁴	X	—	France
Provincetown ⁸⁷	..	KDFE	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	N	0.40	United States of America
Proximus ¹	..	—	—	Rederiet J. J. Petersen, Handerslev	—	—	N	—	Denmark
Prudente de Moraes	..	SRV	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	PG	N	0.40	Brazil
Pruitt ¹⁰²	..	NUPV	—	—	300, 600	PG	N	—	United States of America
Prusa ¹⁰³	..	KELQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	X	0.40	United States of America
Pruth ¹⁰	..	EUU	145	—	300, 600	PG	X	0.40	Great Britain
Prygona ¹⁰	..	EQF	—	—	300, 600	PG	X	0.40	Great Britain
Psara	..	SYQ	—	Navy	—	O	—	—	Greece
P. Satruestegui ¹	..	EDS	430	Compañia Trasatlantica, Barcelona	300, 600	PG	N	0.30	Spain
Psailander	..	SBS	—	Navy	—	O ³⁰	N	—	Sweden
Psyche ¹	..	UGQ	200	Société Maritime Auxiliaire de Transports, Nantes	300, 600	PG	X	0.40	France
Pueblo ⁹⁸	..	NDN	—	Navy	300, 600	PG	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Puente	..	KDSS	—	Union Oil Company	300, 450, 600	PG	X	—	United States of America
Puerto Rico ¹	..	FGU	250	Compagnie Générale, Transatlantique, Paris	300, 600	PG	X	0.40	France
Pueyrredon ¹	..	LJX	—	Navy	450, 600	O	N	—	Argentine Republic
Puget Sound ⁸⁷	..	WER	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	N	0.40	United States of America
Puglia	..	IKK	—	Navy	—	—	N	—	Italy
Pulwico ⁹³¹	..	KUQL	—	U.S. Shipping Board, Washington (D.C.)	—	PG	—	0.40	United States of America
Puma ¹⁹	..	GDTY	—	—	300, 600	PG	X	1.00 ⁸⁷	Great Britain
Pundit ¹⁹	..	OCO	—	—	300, 600	PG	X	0.40	Great Britain
Pungue ⁶¹	..	CUU	100-150	—	300, 600	PG	X	4.00	Portugal
Pura Rasilla ¹	..	TNM	150	Wenceslao Gonzalez Garra, Villagarcia	300, 600	PG	N	0.30	Spain
Purísima	..	KDVJ	—	—	—	PG	X	—	United States of America
Puritan ⁹³¹	..	WDU	150	Chic Racine and Mil Line	300, 600	PG	X	—	United States of America
Purmea ¹⁸	..	BSQ	225	—	300, 600	PG	X	0.40	Great Britain
Purpura ¹⁸	..	ZWS	—	—	300, 450, 600	PG	X	—	Great Britain
Purds ¹⁸	..	SSE	200	Lloyd Brasileiro, Rio de Janeiro	300, 600	PG	X	0.40	Brazil
Putanam KIXQ ¹⁰⁸	..	KIXQ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	4.00	United States of America
Putnam NUPG	..	NUPG	—	—	300, 600	PG	N	—	United States of America
Putney ¹⁸	..	YKQ	135	Association Maritime, Belge, Antwerp	300, 600	PG	N	—	United States of America
Pyrgos ¹⁰	..	ORVA	150-200	—	300, 600	PG	X	0.40	Great Britain
Pyreneus ¹⁶	..	SSD	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	PG	N	0.40 ¹¹¹ 0.40 ¹¹²	Brazil
Pyro ⁹⁹	..	NELK	—	Navy	300, 600	PG	N	—	United States of America

Shipboard Stations—Continued

Name.	Call. Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Per- formed.	Hours of Service.	Ship Charge. Frances.		Country.
							Per Word.	Mini- mum per Radio- tele- gram.	
Pyrhus ²¹	YOY	—	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Pynla ¹⁹	EZH	185	—	300, 600	P G	X	0.40	—	Great Britain
Pythia ¹	LHT	300-400	(Armateur) Chr. Christensen, Jr., Sandefjord	300, 450, 600	P G	X	0.40	4.00	Norway
Python ^{9 131}	WNIO	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Quabbin ^{9 131}	KUJZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Quail ⁹⁹	NIKQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Quaker City ⁹⁷	KOZL	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Quantico ¹⁰²	KQQ	—	Merchants and Miners' Transpor- tation Co.	300, 450, 600	P G	X	0.40	—	United States of America
Quantock ¹⁹	ZIF	100-150	Navy	300, 600	P G	X	0.40	—	Great Britain
Quanza ¹⁹	PSD	—	Navy	300, 600	O	—	—	—	Portugal
Quarto ¹⁹	IKD	—	Compagnie Française de Marine et de Commerce, Paris	—	—	—	—	—	Italy
Quartz ¹	FWQ	—	Transports Maritime de l'Etat	—	P G	X	0.40	—	France
Quebec ¹	HTE	250	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	X	0.40	—	France
Quebec XVE ²¹	XVE	100	—	300, 600	P G	X	0.40	—	Canada
Quebec City ¹⁹	GBNX	—	—	300, 600	P G	X	0.40	—	Great Britain
Queeda ¹⁹	GOA	200	—	300, 600	P G	X	0.40	—	Great Britain
Queen ^{9 131}	WGX	150	Pacific Mail S.S. Co., 508, Market Street, San Francisco (Cal.)	300, 600	P G	N	0.40	—	United States of America
Queen II ²	WOY	40	Central Illinois Public Service Co., Beardstone (Ill.)	400	P	X	—	—	United States of America
Queen Alexandria ¹⁹	ELN	130	—	300, 600	P G	X	0.40	—	Great Britain
Queen Elizabeth EVN ¹⁹	EVN	160	—	300, 600	P G	X	0.40	—	Great Britain
Queen Elizabeth	GEFC	—	Navy	—	P G	—	—	—	Great Britain
Queen Louise ¹⁹	EUV	170	—	300, 600	P G	X	0.40	—	Great Britain
Queen Margaret ¹⁹	ZRW	160	—	300, 600	P G	X	0.40	—	Great Britain
Queensland ¹⁹	EJE	175	—	300, 600	P G	X	0.40	—	Great Britain
Queensland Transport ¹⁹	ZEA	190	—	300, 600	P G	X	0.40	—	Great Britain
Quelimane ¹⁹	CUQ	100-150	—	300, 600	P G	X	0.40	—	Portugal
Quentin ¹⁹	ZOV	120	—	300, 600	P G	X	0.40	4.00	Portugal

Quentin-Rosevelt	FAQR	—	Navy	Operated by	300, 450, 600	O	—	Argentine Republic
Querandí	LMK	200	Navy	186-r88, St. Stephen's House,	450, 600	P	0.40	Great Britain
Querimba	GOB	—	—	Victoria Embankment, London	300, 600	P	—	Great Britain
Quesnoy (Le)	GFWZ	—	—	—	300, 450, 600	—	—	Great Britain
Quest	GFZV	—	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P	—	United States of America
Quillota	MWK	200	—	—	300, 600	P	0.40	Great Britain
Quillwark	KUZM	300	—	—	300, 450, 600	P	0.40	United States of America
Quilboa	GOC	200	—	—	300, 600	P	0.40	Great Britain
Quilpué	GBTL	200	—	Hart Wood Lumber Co., San Francisco (Cal.)	300, 600	P	0.40	Great Britain
Quintault	KDND	200	—	—	300, 600	P	0.20 111	United States of America
Quincy	NGQ	—	—	—	300, 600	P	0.40 112	United States of America
Quinnipiac	KQQT	—	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P	—	United States of America
Quirinale	UPQ	140	—	Lloyd Triestino Società di Navigazione à Vapore, Trieste	300, 600	P	0.40	Italy
Quiros	NQZ	—	—	—	300, 600	P	0.20 111	United States of America
Quistoneck	WREI	300	—	—	300, 600	P	0.40 112	United States of America
Quito CDO	CDO	250	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	0.40	Chile
Quito ZWF	ZWF	150	—	Cia Nacional de Vapores, Calle Blanco, 1169, Valparaiso	300, 600	P	0.40	Great Britain
Quittacas	WRUO	—	—	—	300, 600	P	—	United States of America
R.1	NILC	—	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P	0.40	United States of America
R.2	NILD	—	—	Navy	300, 600	P	0.20 111	United States of America
R.3	NILF	—	—	Navy	300, 600	P	0.40 112	United States of America
R.4	NILG	—	—	Navy	300, 600	P	0.40 112	United States of America
R.5	NILJ	—	—	Navy	300, 600	P	0.40 112	United States of America
R.6	NILK	—	—	Navy	300, 600	P	0.40 112	United States of America
R.7	NILL	—	—	Navy	300, 600	P	0.40 112	United States of America
R.8	NILM	—	—	Navy	300, 600	P	0.40 112	United States of America
R.9	NILN	—	—	Navy	300, 600	P	0.40 112	United States of America
R.10	NILP	—	—	Navy	300, 600	P	0.40 112	United States of America
R.11	NILQ	—	—	Navy	300, 600	P	0.40 112	United States of America
R.12	NILR	—	—	Navy	300, 600	P	0.40 112	United States of America
R.13	NILS	—	—	Navy	300, 600	P	0.40 112	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours or Service.	Ship Charge, Francs.		Country.
							Per Word	Minimum per Radio-telegram.	
R.14 ⁹⁵	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.15 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.16 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.17 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.18 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.19 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.20 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.21 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.22 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.23 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.24 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.25 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.26 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
R.27 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
Rabymere ¹⁹	..	140	—	300, 600	P G ..	X	0.40 0.40	—	Great Britain
Raconigiti ¹⁷	..	140	Lloyd Sabauda Società Anonima per Azioni, Genoa	300, 600	P G ..	X	0.40	—	Italy
Racer	..	—	Navy	—	P G ..	—	—	—	Great Britain
Radames ³⁵	..	200	—	300, 600	P G ..	—	—	—	Germany
Radford ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.40 0.20 111 0.40 112	4.00	United States of America
Radiant ^{9 131}	..	150	Standard Oil Co. of New York, Incorp., 26, Broadway, New York	300, 450, 600	P G ..	X	0.40	—	United States of America

Radium ¹ ..	..	FPK	200	à Vapeur, Marseilles	300, 600	P G ..	X	0.40	—	France
Radix ¹⁹ ..	..	GFLK	—	Société Anonyme des	300, 450, 600	P G ..	X	0.40	—	Great Britain
Radja ¹ ..	..	PHA	250	Etablissements Ch. Leborgne	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Radnor ⁹ ¹³¹ ..	..	KJUE	300	Stoomvaart Maatschappij Nederland, Amsterdam	300, 470, 600	P G ..	X	0.40	—	United States of America
Radnorshire ¹⁹ ..	..	GBOX	190	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	Great Britain
Radstock ..	..	GELF	190	Navy	300, 600	P G ..	X	—	—	Great Britain
Raeburn ¹⁹ ..	..	MES	—	Navy	300, 600	P G ..	X	0.40	—	Great Britain
Rageot-de-la-Touche ..	..	FAXK	—	Navy	600, 800	P G ..	N	0.05	—	France
Ragnar ..	..	SCR	—	Navy	300, 600	O ⁹⁹ ..	—	—	—	Sweden
Ragne ¹ ..	..	SIY	200	Stockholms Rederiaktiebolaget Svea, Stockholm	300, 600	P G ..	—	0.40	4.00	Sweden
Ragnvald Jarl ¹ ..	..	ART	200-250	(Armateurs) Det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G ..	X	0.40	4.00	Norway
Ragunda ¹ ..	..	SDA	150	Rederiaktiebolaget Frederika, Kramfors	300, 600	P ..	—	0.40	4.00	Sweden
Raidler ..	..	GELJ	—	Navy	—	P G ..	—	—	—	Great Britain
Raifuku Maru ¹ ..	..	JHL	400	Kokusai Kisen Kaisha	300, 600	P G ..	—	0.40	—	Japan
Rail ⁹⁹ ..	..	NAQJ	—	Navy	300, 600	P G ..	—	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rainbow ⁹⁹ ..	..	NFZ	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rainier ⁹⁷ ..	..	WRZ	150	Atlas S.S. Company, 2, Pine St., San Francisco (Cal.)	300, 450, 600	P G ..	X	0.40 ¹¹² 0.20	—	United States of America
Raithwaite ¹⁹ ..	..	MNX	140	—	300, 600	P G ..	—	0.40	—	Great Britain
Rajah WAO ⁹ ¹³¹ ..	..	WAO	150	Rajah S.S. Company	300, 600	P G ..	—	0.40	—	United States of America
Rajah XKP ¹³ ..	..	XKP	200	—	300, 600	P G ..	X	0.40	—	Great Britain
Rajput ¹⁹ ..	..	XMU	200	Union S.S. Co. of N.Z., Ltd.	300, 600	P G ..	X	0.40	—	Great Britain
Rakaoa ³ ..	..	VME	250	Toyko Kisen Kaisha (Orient al Steamship Co.)	300, 600	P G ..	—	0.20	—	New Zealand
Rakuyo Maru ¹ ..	..	JAMA	400	—	300, 600	P G ..	—	0.40	—	Japan
Raleigh GEJW ..	..	GEJW	—	Navy	—	P G ..	—	—	—	Great Britain
Raleigh NIRT ⁹⁹ ..	..	NIRT	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rallus ¹⁹ ..	..	GJLX	—	—	300, 450, 600	P G ..	X	0.10 ⁸	1.00 ⁸	Italy
Ralum ³⁵ ..	..	DLM	—	—	300, 600	P G ..	X	0.40	4.00	Germany
Ramapo ⁹⁹ ..	..	NUGP	70	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Ramier	FBWR	—	Navy	300, 800	P G	N	0.05	—	France
Ramilles	GECJ	—	Navy	—	P G	—	—	—	Great Britain
Ramón ¹	CMR	150	Compañía Naviera Euzkera, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Ramón de Bikuña ¹	TKI	150	Compañía Naviera Bidasoa	300, 600	P G	N	0.30	3.00	Spain
Ramon de Larrinaga ¹⁰	GCZP	150	Compañía Marítima Espanola, S. Sebastian	300, 600	P G	N	0.40	—	Great Britain
Ramonita ²	TKK	150	Compañía Marítima Espanola, S. Sebastian	300, 600	P G	N	0.30	3.00	Spain
Ramón Munbrí ¹	TKJ	200	Domingo Munbrú, Barcelona	300, 600	P G	N	0.30	—	Spain
Ramore Head ¹⁰	YSG	200	—	300, 600	P G	X	0.40	—	Great Britain
Ramos ⁷¹	GBTM	140	Amazon Telegraph Co., Ltd.	300, 600	P G	—	—	—	Great Britain
Ramsay NIFC ¹⁰	NIFC	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ransley GFTY ¹⁰	GFTY	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Ran OVL ¹	OVL	—	Navy	600	O 30	X	—	—	Denmark
Ran SCQ	SCQ	—	Navy	—	—	X	—	—	Sweden
Rancagua	CAL	—	Navy	—	—	—	—	—	Chile
Rance	FAOC	—	Navy	600, 800	P G	N	0.05	—	France
Randfontein ¹	HEK	200	Nederlandsche-Zuid-Afrikaansche Stoomvaart, Maatschappij, Holland Zuid Afrika Lijn, Rotterdam (Armateur) A/S den Norske	300, 600	P G	X	0.40	4.00	Holland
Randsford	LCE	150-200	Maatschappij Stoomschip Randwijk (Direction) Erhardt and Dekkers, Rotterdam	300, 800	P G	X	0.40	4.00	Norway
Randwijk ¹	PIU	150	—	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Ranee ¹⁰	XKO	200	—	300, 600	P G	X	0.40	—	Great Britain
Ranella ¹⁰	MZP	100	—	300, 600	P G	X	0.40	—	Great Britain
Ranenford ¹	LGS	200-250	Linje, Christiania	300, 600	P G	X	0.40	4.00	Norway
Ranger MLD ⁷¹	MLD	150	Liverpool Salvage Association	300, 600	P	X	0.10 ⁸⁷ 0.20 ¹¹¹	1.00 ⁸⁷	Great Britain
Ranger NUDG ¹⁰	NUDG	—	—	300, 600	P G	N	0.40 ¹¹²	—	United States of America
Ranger VOK	VOK	150	—	—	—	—	—	—	Newfoundland
Raigooni Maru ¹	JDY	200	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	—	0.40	—	Japan
Ransom B. Fuller ^{9 131}	KRF	200	Eastern S.S. Lines, India Wharf, Rangoon	300, 600	P G	X	0.40	—	United States of America

Rapallo ¹⁷	UNV	140	Esercizio Bacioli, Genoa	300, 600	P G	—	Great Britain Great Britain
Raphael ¹⁹	MET	175	—	300, 600	P G	—	United States of America
Rapidian EQV ¹⁹	EQV	180	—	300, 600	P G	—	United States of America
Rapidan NUGQ ⁹⁹	NUGQ	—	Navy	300, 600	P G	—	United States of America
Rapid	GELK	—	Navy	—	P G	—	Great Britain
Rapide (Le) ¹	OPR	100-150	Government	300, 600	P G	4.00 ¹¹	Belgium
Rapids King ²¹	VEG	125	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	0.40	Canada
Rapids Prince ²¹	VGLC	150	Canadian Steamship Lines Ltd., Montreal (P.Q.)	300, 600	P G	—	United States of America
Rappahannock ²	WQQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	Egypt
Raquib ¹	SUK	200	Navy	300, 450, 600, 800	—	—	Great Britain
Raranga ¹⁹	ZNI	200	Telshinso (Ministry of Communi- cations)	300, 600	P G	0.40	Japan
Rashu Maru ¹	JER	400	Aktieselskabet København Bunkerkul Depot, Copenhagen	300, 600	P G	0.40	Denmark
Rask ⁴⁰	OYX	200	Navy	300, 450, 600	P G	4.00	Great Britain
Rassay ¹⁹	MGR	140	—	300, 600	P G	—	United States of America
Rathburne ⁹⁹	NACR	150	—	300, 600	P G	—	Great Britain
Rathlin ¹⁹	GPMC	—	London & North Western Railway Company	300, 450, 600	P G	1.00 ⁸⁷	Great Britain
Rathlin Head ¹⁹	ZAR	150	Navy	300, 600	P G	0.40	United States of America
Rathmore ¹¹	GUT	250	—	300, 600	P G	0.40 ¹¹²	Great Britain
Ravelston ¹⁹	YGV	135	—	300, 600	P G	0.40	Great Britain
Raven NIKZ ⁹⁹	NIKZ	—	—	300, 600	P G	0.40 ¹¹²	United States of America
Ravenrock ¹⁹	GCSY	135	—	300, 600	P G	—	Great Britain
Ravenspoint ¹⁹	XFR	135	—	300, 600	P G	—	Great Britain
Ravenstone ¹⁹	BZF	145	—	300, 600	P G	—	Great Britain
Ravenswood ¹⁹	GENR	—	—	300, 450, 600	P G	1.00 ⁸⁷	Great Britain
Ravensworth ¹⁹	GBJN	170	Navy	300, 600	P G	—	Great Britain
Ravn	LBG	—	—	300, 600	P G	—	Norway
Ravnanger ¹	LHV	100-150	Navy (Armateurs) Westfal Larsen & Co. A/S, Bergen	300, 600	P G	4.00	Norway
Ravnefjell ¹	AUT	200	(Armateurs) Olsen & Ugelstad, Christiania	300, 600	P G	—	Norway
Rayo ¹⁰³	KTL	300	Standard Oil Co. of New York, 26, Broadway, New York (N.Y.)	300, 600	P G	—	United States of America
R. C. Rickmers ³²	DXV	200	Navy	300, 600	P G	—	Germany
R.D. ¹⁴	IGM	200	—	300, 600	P G	0.40	Italy
Reading ¹⁹	EXK	145	—	300, 600	P G	—	Great Britain
Ready	GELM	—	Navy	300, 600	P G	—	Great Britain
Reael ¹	ANK	150	Koninklijke Paketvaart Maats- chappij, Amsterdam	300, 600	P G	—	Dutch East Indies
Real ³²	DRL	200	Texas S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	P G	—	Germany
Resper ¹⁰³	KDLG	200	—	300, 450, 600	P G	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Rebia ¹ ..	FPI	120	Compagnie de Navigation Paquet, Marseilles	300, 450, 600	P G ..	X	0.40	—	France
Recalde ..	EBU	220	Navy ..	—	O ..	—	—	—	Spain
Recca ¹⁷ ..	UFM	190	Navigazione Libera Triestina, Trieste	300, 600	P G ..	—	0.40	—	Italy
Recco ¹⁷ ..	UOS	190	Esercizio Bacini, Genoa ..	300, 600	P G ..	X	0.40	—	Italy
Recorder ²¹ ..	MEJ	140	Eastern Extension Australian and China Telegraph Co., Ltd.	300, 600	P ..	X	0.40	—	Great Britain
Redbridge ¹⁹ ..	YHQ	155	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Redgate ¹⁹ ..	ZTL	—	Navy ..	300, 600	P G ..	X	0.40	—	Great Britain
Redgauntlet ..	GELN	—	Erie Basin Towing and Hoisting Company	300, 450, 525, 600	P G ..	X	—	—	Great Britain
Red Hook ⁹⁷ ..	KDDA	300	—	300, 450, 525, 600	P R ..	—	0.20	—	United States of America
Re d'Italia ¹⁷ ..	IYR	190	Lloyd Sabauda Società Anonima per Azioni, Genoa	300, 600	P G ..	N	0.40	—	Italy
Red Mountain ⁹ ¹³¹ ..	KOTQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Redondo KYT ² ..	KYT	300	Redondo Steamship Company, 52, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.20	—	United States of America
Redondo WBM ⁹⁷ ..	WBM	100	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 600	P G ..	X	0.20	—	United States of America
Redoubt ..	GELP	—	Navy ..	—	P G ..	—	—	—	United States of America
Redruth ¹⁹ ..	XMC	150	—	300, 600	P G ..	—	—	—	Great Britain
Redwing ⁹⁹ ..	NKG	—	Navy ..	300, 600	P G ..	—	0.40	—	Great Britain
Redwood ⁹⁷ ..	WSD	300	Pacific American Fisheries, South Bellingham (Wash.)	300, 450, 525, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Redwater ⁷¹ ..	GBVF	—	Marine Department of the Roumanian Government	300, 600	P ..	X	0.40	—	United States of America
Reggie Carol I ..	CVC	300	—	600	P R ¹⁰ ..	N	—	—	Great Britain
Regent ¹⁹ ..	EZQ	145	Stockholms Rederiaktiebolag Svea, Stockholm	300, 600	P G ..	X	0.30	3.00	Roumania
Regin ¹ ..	SFK	150	—	300, 600	P G ..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40 0.40	— 4.00	Great Britain Sweden

Regina ^{18 17}	ZOD	160	Lloyd Sabaudo Società Anonima, per Azioni, Genoa	300, 600	P G	N	0.40	Italy
Regina d'Italia ¹⁷	INI	190	Navy	300, 450, 600	P	—	—	Italy
Regina Elena	IHQ	—	Victoria Harbour Lumber Co., Windsor (Ont.)	300, 600	P	—	—	Canada
Reginald ²¹	VEY	100	Navy	300, 800	P G	N	0.05	France
Regault	FAGL	—	Navy	300, 800	P G	N	0.05	France
Regulus FBOR	FBOR	—	Navy	300, 600	P G	N	0.20	Norway
Regulus LHD ¹	LHD	300	(Armateurs) A. O. Lindvig, Christiania	300, 600	P G	X	0.15	Canada
Regulus OJU	OJU	100	Finska Angfartygs Aktiebolaget, Helsingfors	300, 600	P G	N	—	United States of America
Regulus NASQ ¹⁰²	NASQ	—	—	300, 450, 600, 800	P G	N	0.40	Germany
Reichenfels ³⁵	DRF	200	—	300, 600	P G	N	—	United States of America
Reid ¹⁰²	NUNK	—	Dampfschiffahrts-Gesellschaft	300, 600	P G	N	0.40	Germany
Reiher ³⁶	DRR	200	Afgo, Bremen	300, 800	P G	N	0.05	France
Reiher DRI ³⁶	DRI	200	Transports Maritimes de l'Etat	300, 450, 600	P G	N	0.40	France
Reims FBRE	FBRE	—	Navy	300, 800	P G	N	—	Spain
Reims HSB ¹	HSB	200	Transports Maritimes de l'Etat	300, 600	P G	N	—	Spain
Reina Maria Cristina ¹	EDK	430	Compañia Trasatlantica, Barcelona	300, 600	G P	N	0.30	Spain
Reina Regente	EBH	270	Navy	—	O	N	—	Spain
Reina Victoria ²	EFV	300	Compañia Transmediterranea, Bar- celona	300, 600	P G	N	0.30	Spain
Reina Victoria Eugenia	CLN	—	Navy	—	O	—	—	Spain
Reina Victoria Eugenia	EDU	430	Compañia Trasatlantica, Barcelona	300, 600	P G	N	0.30	Spain
Reindeer MSD ⁷¹	MSD	120	Great Western Railway Co.	300, 600	P G	N	0.10 ⁸⁷	Great Britain
Reindeer ZRN ¹⁹	ZRN	—	Reinder Steamship Co., Ltd.	300, 600	P G	N	0.40	Great Britain
Reiyo Maru ¹	JOO	400	Toya Kisen Kaisha (Oriental Steamship Company)	300, 600	P G	N	0.40	Japan
Relay ¹⁰³	KVZ	300	All America Cable Company	300, 450, 600	P	X	—	United States of America
Relentless GELQ	GELQ	—	Navy	—	P G	—	—	Great Britain
Relentless XHN ¹⁹	XHN	110	Atlantic Mail Corporation	300, 600	P G	X	0.40	Great Britain
Reliance ²	KDYE	200	—	300, 450, 600, 1,800	P G	N	0.40	United States of America
Reliance VGKJ ²¹	VGKJ	150	Lake Superior Paper Co., Sault Ste. Marie (Ont.)	300, 600	P	—	0.40	Canada
Reliant ²¹	GCYX	—	Maritime Salvors, Ltd.	300, 600	P	X	—	Great Britain
Relief ¹⁷	KRJ	200	Morrill & Chapman, Derrick and Wrecking Co., 17, Battery Place, New York (N.Y.)	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Relief, Hospital Ship No. 1 ¹⁰²	NEPQ	—	—	300, 600	P G	N	—	United States of America
Refillio ¹⁹	XLZ	140	Stoomvaart Maatschappij Neder- land, Amsterdam	300, 600	P G	X	0.40	Great Britain
Rembrandt ¹	PFK	350	—	300, 600	P G	N	0.40	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Remier ¹⁰	OOM	100-150	Lloyd Royal Blege, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Remiremont	FBRM	—	Navy	300, 800	P G	N	0.05	—	France
Remlik III ²	KZR	200	Yacht, belonging to Willis S. Kilmer (R. B. Jones), 29, Broadway, New York (N.Y.)	300, 600	P G	X	0.20 0.40 112	—	United States of America
Remo ¹⁷	UQB	140	Lloyd Trieste, Società di Navigazione a Vapore, Trieste	300, 600	P G	X	0.40	—	Italy
Remuera, ¹⁹	MKV	250	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Great Britain
Remus ¹⁰⁸	KEBX	200	(Armateurs) A. O. Lindvig, Christiania	300, 450, 600	P G	X	0.20	—	United States of America
Remus AVU ¹	AVU	125	Den Norske Afrika-og-Australielinje (Wilh. Wilhelmsen), Tonsberg	300, 450, 600	P G	X	0.40	4.00	Norway
Rena ¹	LFD	150-250	Cia. Sud Americana de Vapores, Calle Blanco, 895, Valparaiso	300, 600	P G	X	0.40	4.00	Norway
Renaico ¹	CDA	150	Navy	300, 800	P G	X	0.40	4.00	Chile
Renard	FBKR	—	Navy	300, 800	P G	N	0.05	—	France
Rene Audrey	FANB	—	Société les Pêcheries de France, 16, Rue des Pyramides, Paris	300, 600	P G	X	0.05	—	France
Rene Godet ¹	FWY	250	Navy	300, 800	P G	N	0.40	—	France
Renée	FAYR	—	Navy	300, 800	P G	N	0.05	—	France
Renne	FABC	—	Navy	300, 800	P G	N	0.05	—	France
Reno NAMD ⁹⁹	NAMD	—	Navy	300, 600	P G	N	0.20	—	United States of America
Reno WYAN ²	WYAN	30	Government Washington (D.C.)	400	O	X	—	—	United States of America
Renown	GEZT	—	Navy	300, 600	P G	N	0.20 111	—	United States of America
Renshaw ⁹⁹	NEVZ	—	Navy	300, 600	P G	N	0.40 112	—	United States of America
Renteria ¹	TTM	150-200	(Armateurs) Fearnley & Eger, Christiania	300, 600	P G	X	0.40	4.00	Norway
Republic ¹⁰⁸	WSU	300	Chili S.S. Co., Incorp., 120, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.20	—	United States of America
Republica	SOU	60	Navy	300	P G	X	0.40	—	Brazil
Republica Argentina ¹⁰	OPG	100-150	Cie. Royale Belge Argentina, Antwerp	300, 600	O ¹⁸ P G	X	0.40	4.00	Belgium
Repulse	GEDB	—	Navy	300, 600	P G	X	—	—	Great Britain
Rersby ¹⁹	MMC	145	M. H. Bland & Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain
Rescue	VRN	100		300, 600	P G	X	—	—	Great Britain

Reserv ¹	SKG	150	Sunds Rederi Aktiebolag, Sundsvall	300, 600	P	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40	4.00	SWEDEN
Reserve Holtenau ¹	DRH	120	—	300, 450, 600	P R ²³	X	0.40	4.00	Germany
Reserve Ostsee ¹	DRE	Day 100 Night 180	—	300, 450, 600	P R ²³	X	0.40	4.00	Germany
Résolue ¹	FYU	150	Pierre Lebaudy	300	P G	N	—	—	France
Resolute KDYA ¹²⁴	KDYA	200	Atlantic Mail Corporation	300, 600, 1,800	P G	N	0.40	—	United States of America
Resolute KRM ²	KRM	150	Merritt & Chapman Derrick and Wrecking Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Resolution	GECK	—	Navy	—	P G	—	—	—	Great Britain
Restless GELR	VGJR	150	Government (Dept. of Marine and Fisheries)	300, 600	O	X	—	—	Great Britain
Restless VGJR ²⁰	VGJR	—	—	—	—	—	—	—	Canada
Restorer GCVY ²¹	GCVY	—	Maritime Salvors, Ltd.	300, 600	P	X	—	—	Great Britain
Restorer WIU ^{9 121}	WIU	300	Commercial Pacific Cable Co., 253, Broadway, New York (N.Y.)	300, 450, 600	P	N	0.40	—	United States of America
Resurrezione ¹⁷	IYV	140	La Polare Società di Navigazione, Genoa	300, 600	P G	X	0.40	—	Italy
Retriever GDVT ²¹	GDVT	—	West Coast of America Telegraph Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain
Retriever GELS	GELS	—	Navy	—	P G	—	—	—	Great Britain
Retter ²⁸	DRW	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Reuben James ¹⁰²	NUNT	—	—	300, 600	P G	N	—	—	United States of America
Reuce ²	WSR	100	Columbia River Packers' Associa- tion, Astoria (Oregon)	300, 525, 600	P G	X	0.20 ¹¹¹	—	United States of America
Reval ¹⁹	BEB	120	Navy	300, 600	P G	X	0.40	—	Great Britain
Revenge	GECL	—	—	—	P G	—	—	—	Great Britain
Reventazan ¹⁹	GDCV	—	—	300, 600	P G	X	0.40	—	Great Britain
Revigny	FARV	—	Navy	300, 800	P G	N	0.05	—	France
Re Vittorio ¹⁷	IZV	270	Navigazione Generale Italiana, Genoa	300, 600	P G	N	0.40	—	Italy
Rewa ⁴⁹	VMI	Day 200 Night	Geo. H. Scales Pacific, Ltd.	300, 600	P G	X	0.20	—	New Zealand
Rexmore ¹⁹	XHY	350	—	300, 600	P G	X	0.40	—	Great Britain
Rey Jaime I ²	EFJ	150 200	Compañía Islena Marítima, Bar- celona	300, 600	P G	N	0.30	3.00	Spain
Rey Jaime II ²	EFS	200	Compañía Islena Marítima, Bar- celona	300, 600	P G	N	0.30	3.00	Spain
Rhea ¹	TXR	150	Koninklijke Nederlandse Stoomboot Maatschappij, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Rhinéfels ²¹	YDH	—	Director, India Office Shipping, 5, Bishopsgate, London, E.C.2	300, 600	P G	X	0.40	—	Great Britain
Rheinland ²⁵	DNB	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Rheinland ²⁵	DRN	200	—	300, 450, 600, 800	P G	X	0.40	4.00	Germany

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Rhesus ⁷¹ ..	ZII	250	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	X	0.40	—	Great Britain
Rhexenor ⁷¹ ..	GDXB	250	Operated by A. Holt & Co., India Buildings, Water St., Liverpool	300, 450, 600	P G	X	0.40	—	Great Britain
Rhin (Le) ¹ ..	FXP	300	Mareuil Freres, Bordeaux	300, 600	P G	X	0.40	—	France
Rhinoceros ..	FERH	—	Navy	300, 800	P G	N	0.05	—	France
Rho ¹⁹ ..	VHW	135	—	300, 600	P G	X	0.40	—	Great Britain
Rhode Island BUX ¹⁹ ..	BUX	150	—	300, 600	P G	X	0.40	—	Great Britain
Rhode Island NTX ⁸⁹ ..	NTX	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rhodesia ⁴⁸ ..	OGLA	250	Aktieselskabet Dampskibsselskabet Orient, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Rhodesian Transport ¹⁹ ..	ZGB	160	—	300, 600	P G	X	0.40	—	Great Britain
Rhodopis ³⁴ ..	DRP	400	—	300, 450, 600	P G	X	0.40	4.00	Germany
Rhône	FALR	—	Navy	300, 800	P G	N	0.05	—	France
Rhuys ¹ ..	FAH	150	Société des Chargeurs de l'Ouest, Nantes	300, 600	P G	X	0.40	—	France
Rialto ¹⁹ ..	GBNS	—	—	300, 600	P G	X	0.40	—	Great Britain
Ribe ¹ ..	OYS	200	Aktieselskabet Nord-Ostersø Rederi, Copenhagen	300, 600	P	X	0.40	— ³⁸	Denmark
Ribeauville ¹ ..	FDV	150	Société des Armateurs Française, Paris	300, 600	P G	X	0.40	—	France
Ribera ¹⁹ ..	GFLV	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Ricardito ¹ ..	HMA	100	Ricardo Ortiz Arimano, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Richard J. Reiss ^{9 131} ..	WNK	150	Reiss S. S. Co., 402, Rockefeller Building, Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
Richard Peck ^{9 131} ..	KXR	150	New England S. S. Co., Fall River (Mass.)	300, 600	—	X	0.40	— ¹¹⁷	United States of America
Richards ¹⁰³ ..	NIDG	—	—	300, 600	P G	N	—	—	United States of America
Richard Welford ⁸⁰ ..	GBTX	100	U. S. Shipping Board, Washington (D. C.)	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Richconal ¹⁰³ ..	KUTX	300	—	300, 600	P G	X	0.40	—	United States of America
Richelieu ¹ ..	FDM	180	Mauballarg & Cie., La Rochelle	300, 450, 600	P G	X	0.40	—	France
Richmond KDOQ ³² ..	KDOQ	200	J. H. Aitken, Transportation & Towing Company	300, 450, 600	P G	X	0.20	—	United States of America
Richmond NISQ ¹⁰² ..	NISQ	—	—	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America

Richmond WTR ¹ and	WIK	200	Standard Oil Co. of California, Incorp., Sheldon Building, San Francisco (Cal.)	300, 600	P G	X	0.40	0.40	United States of America
Ridderkerk ¹	..	200	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague	300, 600	P G	X	0.40	4.00	Holland
Rietfontein ¹	..	250	Nederlandsche Zuid-Afrikaansche Stoomvaart Maatschappij Holland-Zuid-Afrika Lijn, Rotterdam	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Rigel FVT ¹	..	250	Société Générale des Transports Maritimes à Vapeur, Marseilles (Armateurs) Kluver & Co., Christiantia	300, 600	P G	..	0.40	—	France
Rigel LHP ¹	..	100-150	(Armateurs) Camillo Eitzen & Co., Christiana	300, 600	P G	..	0.40	4.00	Norway
Rigel NURG ¹⁰²	..	—	Navy	300, 600	P G	..	—	—	United States of America
Rigel ¹	..	400	Naamloose Vennootschap Houtvaart, Rotterdam	300, 600	P G	..	0.40	4.00	Norway
Rigorous ¹	..	150	Holland-Amerika Line	300, 450, 600, 800, 1,800	P G	..	0.40	4.00	Great Britain
Rijn ¹	..	Day	..	..	..	..	0.40	4.00	Holland
Rijnland ¹	..	500 Night	..	..	..	..	0.40	4.00	Holland
Rijndijk ¹	..	1,000	Solleveld & Van Der Meer en T. H. Van Hattum, Stoomvaart Maatschappij, Rotterdam	300, 600	P G	..	0.40	4.00	Holland
Rijnland ¹	..	150	Koninklijke Hollandsche Lloyd, Amsterdam	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Rijnburg ¹	..	200	Vrachvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Rijperkerk ¹	..	200	Vereenigde Nederlandsche Scheepvaart Maatschappij, The Hague	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Rijswijk ¹	..	150	Maatschappij Stoomschip Rijswijk (direction of Erhardt & Dekkers), Rotterdam	300, 450, 600, 800	P G	..	0.40	4.00	Holland
Rinorchiatore Italiano	..	—	Navy	—	..	..	—	—	Italy
Rimouski ¹⁹	..	230	..	300, 600	P G	..	0.40	—	Great Britain
Rimutaka ¹⁹	..	230	Den Norske Afrika-og Australielinge (Wilh. Wilhelmsen), Louis-berg	300, 600	P G	..	0.40	—	Great Britain
Rindia ¹	..	150-200	Stoomvaart Maatschappij Rotterdam	300, 600	P G	..	0.40	4.00	Norway
Rindiani ¹	..	200	..	300, 600	P G	..	0.40	—	Holland
Ringborg ¹	..	200-250	(Armateurs) H. M. Wrangell & Co., A/S Haugesund	300, 600	P G	..	0.40	4.00	Norway
Ringdove's Aid ¹⁹	..	—	..	300, 450, 600	P G	..	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Ringgo d ¹⁹	..	—	Navy	300, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ringhorn ¹	..	150-175	(Armateurs) Albert Schjelderup, Dampskibsselskabet Rhinghorn, Bergen	300, 600	P G	..	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Rio (El) ² ..	KKZ	200	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 450, 600	P G ..	N	0.40 m	—	United States of America
Rio Amazonas ¹⁶ ..	PVK	250	Compañia Lloyd Nacional, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Rio Azul ⁵⁹ ..	GJBK	100	Operated by Thompson S.S. Co., Ltd., 6, Lloyd's Ave., London, E.C.3	300, 450, 600	P G ..	X	0.40	—	Great Britain
Rio Blanco ⁷¹ ..	GFXB	—	Walthey, Ltd., c/o A. M. Dollar, 402, Pender St., W., Vancouver (B.C.)	300, 450, 600	P G ..	X	0.40	—	Great Britain
Rio Bonita ² ..	VGNS	100	Lloyd Chileno, Calle Blanco 1199, Valparaiso	300, 600	P ..	— ²⁷	—	—	Canada
Rio Bueno ..	CEB	—	Lloyd Chileno, Calle Blanco 1199, Valparaiso	—	—	—	—	—	Chile
Rio Claro CEA ..	CEA	—	Lloyd Chileno, Calle Blanco 1199, Valparaiso	—	—	—	—	—	Chile
Rio Claro ¹⁵ ..	GFXJ	—	—	—	—	—	—	—	Great Britain
Rio de Janeiro DRJ ¹⁸ ..	DRJ	200	—	300, 450, 600, 800	P G ..	X	0.40	—	Germany
Rio de Janeiro LDM ¹ ..	LDM	150-250	(Amateurs) det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G ..	X	0.40	—	Norway
Rio de Janeiro SRA ¹⁵ ..	SRA	250	Lloyd Brasileiro, Rio de Janeiro, ..	300, 600	P G ..	N	0.40	—	Brazil
Rio de la Plata EBFK ..	EBFK	—	Navy	300, 600	O ..	—	—	—	Spain
Rio de la Plata LDN ¹ ..	LDN	150-250	(Amateurs) det Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G ..	X	0.40	—	Norway
Rio Galindo ¹ ..	TLZ	200	Naviera Galindo, Deva ..	300, 600	P G ..	N	0.30	—	Spain
Rio Grande KEG ¹⁰³ ..	KEG	200	Mallory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Rio Grande LCD ¹ ..	LCD	150-200	(Amateurs) den Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G ..	X	0.40	—	Norway
Rio Grande do Norte	SNS	60	Navy	300	O ¹⁶	—	0.40	—	Brazil
Rio Grande do Sul	SOR	150	Navy	300, 450, 600	O ¹⁶	—	0.40	—	Brazil
Rio ¹⁹ ..	GFXP	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Rio ¹⁹ ..	XJI	140	—	300, 600	P G ..	X	0.40	—	Great Britain
Rio Negro BGK ⁷¹ ..	BGK	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Rio Negro LLU ¹ ..	LLU	—	Navy	450, 600	O ..	—	—	—	Argentine Republic
Rio Preto ¹⁹ ..	BAW	160	Enrique J. Vidal, Buenos Aires ..	300, 600	P G ..	X	0.40	—	Argentine Republic
Rio Uruguay ¹ ..	LRJ	108	Stoomvaart Maatschappij Neder-	300, 600	P G ..	X	0.40	—	Holland
Rionw ¹ ..	PHB	250	land, Amsterdam.	300, 450, 600, 800	P G ..	X	0.40	—	Holland

Ripault (Le) Ripault HXG (Le) ¹	FAOK HXG	— 180	Navy Société Anonyme de Navigation les Armateurs, Français	600, 800 300, 600	P G P G	.. ..	X X	0.05 0.40	— —	France
Ripley Castle ¹⁹ Ripon ²⁷	BBW KUGM	— 200	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 450, 600	P G P G	.. ..	X X	0.40 0.40	— —	Great Britain United States of America
Riposto ¹⁹ Ripple Riquelme	GNK KDUN CBP	— — —	James T. McAllister Navy	300, 600 300, 450, 600	P G P G	.. ..	X X	0.40 —	— —	Great Britain United States of America Chile
Risaldar ¹⁹ Rishon ¹⁹	MTE GBVS	180 110	— —	300, 600 300, 600	P G P G	.. ..	X X	0.40 0.40	— —	Great Britain Great Britain
Rismondo Risvær ¹	IAAY TUZ	— 200	Navy (Amateurs) Muller & Johnsen, Bergen	300, 600	P G	..	X	0.40	4.00	Italy Norway
Rita HLR ¹ Rita HNA ¹	HLR HNA	150 150	Hijos de José Taya, Barcelona Hijos de Enrique Gironella, Bar- celona	300, 600 300, 600	P G P G	.. ..	N N	0.30 0.30	3.00 3.00	Spain Spain
Rivadavia ¹ Rival	LJQ GELY	— —	Navy Navy	600, 1,500	O P G	.. ..	N —	— —	— —	Argentine Republic Great Britain
Riva Trigoso ¹⁷	UTD	140	Società Italiana di Salvataggi and Navigazione, Rome	300, 600	P G	..	X	0.40	—	Italy
River Araxes ¹⁹ Riverdale ¹⁹	ZIT YMX	— 150	— —	300, 600 300, 600	P G	..	—	— 0.40	— —	Great Britain Great Britain
River Dare ¹⁹ River Dart ¹⁹ Riverina ¹	GCMQ VJA VJA	— — 250	— — —	300, 600 300, 600 300, 600	P G P G P G	.. .. ..	X X X	0.40 0.40 0.20 ⁸ 0.40 ⁵	— — —	Great Britain Great Britain Australian Commonwealth
River Orontes ¹⁹ Rivers	EVD CBD	150 —	Navy	300, 600	P G	..	X	0.40	—	Great Britain Chile
Riverside Bridge ¹⁰³	KUCD	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
River Taff ¹⁹ Riverton BNE ¹⁹ Riverton VBI ²¹	YH BNE VBI	— 120 250	— — Mathews S.S. Co., Toronto (Ont.)	300, 600 300, 600 300, 600	P G P G P	.. .. ..	X X — ³⁷	0.40 0.40 0.40	— — —	Great Britain Great Britain Canada
River Trent ¹⁹ Riverway ¹⁹ River Wye ¹⁹	MCX ZEG BFP	— — 130	— — —	300, 600 300, 450, 600 300, 600	P G P G P G	.. .. ..	X X X	0.40 0.40 0.40	— — —	Great Britain Great Britain Great Britain
Riviera ²¹ Rizal ⁹⁹	GUO NEVV	50 —	South Eastern and Chatham Ry. Navy	300, 600 300, 600	P G P G	.. ..	X N	0.10 ⁸² 0.20 ¹¹¹ 0.40 ¹¹²	1.00 ⁸² — —	Great Britain United States of America
R. J. Hanna ^{9 121}	KDRD	300	Standard Oil Co. of California, Incorp., Sheldon Building, San Francisco (Cal.)	300, 600	P G	..	X	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
R. J. Skinner ²⁸	VGJR	75	—	450	O	X	—	—	Canada
Road Amundsen ¹	AQAU	200-250	(Armateurs) T. Dannevig & Co., Christiania	300, 600	P G	X	0.40	4.00	Norway
Roana ¹⁷	UQH	190	Roma Società di Navigazione, Roma	300, 600	P G	X	0.40	—	Italy
Roanoke KOKV ¹⁰³	KOXV	200	Rome Texas Company, Port Arthur (Texas)	300, 600	P G	X	0.40	—	United States of America
Roanoke NHU ⁹⁹	NHU	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Roath ¹⁹	ZRI	170	—	300, 600	P G	X	0.40	—	Great Britain
Robert Dollar ²¹	VGNQ	300	Canadian Robert Dollar Co., Ltd., 402, Pender Street, Vancouver (B.C.)	300, 600	P G	— ²⁷	0.40	—	Canada
Robert E. Hopkins	KDVE	—	Tidewater Oil Company	300, 600	P G	X	—	—	United States of America
Robert Luckenbach ⁹⁷	KUKS	300	Luckenbach S.S. Company	300, 600	P G	X	0.40	—	United States of America
Robert M. Thompson ²	KNW	—	American Transportation Co., 17, State Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Roberto Ginori	IOD	190	—	300, 600	P G	X	0.40	—	Italy
Robert P. Clark ¹⁰³	KTH	200	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 450, 600	P G	X	0.40	—	United States of America
Robert Smith ⁹⁹	NUKB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Robilante ¹⁷	UQG	190	Latina Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Robin GKOM	GKOM	—	Navy	—	P G	—	—	—	Great Britain
Robin NANQ ⁹⁹	NANQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Robin Adair ²⁷	KOVM	300	Seas Shipping Company, 39, Cortland Street, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Robin Goodfellow ⁹⁷	KUEN	300	Robin Line Steamship Co., 544, Market St., San Francisco (Cal.)	300, 600	P G	X	0.40	—	United States of America
Robin Gray ⁹⁷	KOXT	300	Robin Line Steamship Co., 544, Market St., San Francisco (Cal.)	300, 440, 525, 600	P G	X	0.40	—	United States of America
Robin Hood ²⁷	KOTM	300	Seas Shipping Corporation, 39, Cortland St., New York (N.Y.)	300, 440, 525, 600	P G	X	0.40	—	United States of America
Robinson ⁹⁹	NAJX	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rob Roy	GELX	—	Navy	—	P G	—	—	—	Great Britain

Company	Country	Capital	Share	Dividend	Year	Notes
Robuste	France	300,000	100	10	1900	
Rochembeau	France	300,000	100	10	1900	
Rochdale	Great Britain	300,000	100	10	1900	
Rochbonne	Great Britain	300,000	100	10	1900	
Rochelle	Great Britain	300,000	100	10	1900	
Rochester	United States of America	300,000	100	10	1900	
Rochester NTR	United States of America	300,000	100	10	1900	
Rochussen	United States of America	300,000	100	10	1900	
Rocio	United States of America	300,000	100	10	1900	
Rockaway Park	United States of America	300,000	100	10	1900	
Rocket	United States of America	300,000	100	10	1900	
Rock Island	United States of America	300,000	100	10	1900	
Rockport	United States of America	300,000	100	10	1900	
Rodfaxe	Denmark	300,000	100	10	1900	
Rodfiel	Norway	300,000	100	10	1900	
Rodgers	United States of America	300,000	100	10	1900	
Rodi	Italy	300,000	100	10	1900	
Rodman Swift	Italy	300,000	100	10	1900	
Rodosto	Norway	300,000	100	10	1900	
Rodskjaer	Norway	300,000	100	10	1900	
Roe	United States of America	300,000	100	10	1900	
Roepat	Holland	300,000	100	10	1900	
Roger de Flor	Spain	300,000	100	10	1900	
Rogeeven	Dutch East Indies	300,000	100	10	1900	
Rogier	Belgium	300,000	100	10	1900	
Roi Albert	Norway	300,000	100	10	1900	
Rölsheim	Great Britain	300,000	100	10	1900	
Roker	Greece	300,000	100	10	1900	
Rokos Vergotis	Germany	300,000	100	10	1900	
Roland	Sweden	300,000	100	10	1900	
Roland SLE	Sweden	300,000	100	10	1900	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Roland-Morillot	FARM	..	PG	N	0.05	—	France
Rolf 40	—	300, 800	—	—	—	—	Denmark
Rolf-Jarl 1	..	200-250	Navy Aktieselskabet Dampskibsselskabet Norden, Copenhagen (Armateurs) Det Nordent Jeldske Dampskibsselskab, Trondhjem	300, 600	PG	X	0.40	4.00	Norway
Rollo 19	..	300	Leroux & Heuzey, 27, Rue Buffon, Rouen	300, 600	PG	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Rollon 1	..	170	Operated by Rowland Marwood's S.S. Co., 43, Flowergate, Whitby	300, 600	PG	X	0.40	—	France
Roma ESW 71	..	250	Compagnie Française de Navigation à Vapeur, Cyprien, Fabre & Co., Marseilles	300, 600	PG	X	0.40	—	Great Britain
Roma FJR 1	Navy	300, 600	PG	N	0.40	—	France
Roma IHP	—	—	—	—	—	—	Italy
Roma INR 17	..	190	Marittima Italiana Società di Navigazione per Servizi Postali, Genoa	300, 600	PG	N	0.40	—	Italy
Roma II 17	..	190	Sicilia Società di Navigazione, Rome	300, 600	PG	X	0.40	—	Italy
Romagne 2	..	150	Independent S.S. Co., Foot Orleans St., Detroit (Mich.)	300, 600	PG	X	0.20 ¹¹⁶	—	United States of America
Romala	Navy	—	PG	—	—	—	Great Britain
România	..	300	Marine Department of the Roumanian Government	600	PR 70	N	0.30	3.00	Roumania
Romanitza 1	..	180	Société Maritime et Commerciale de France, 60, Rue de la Chaussée d'Antin, Paris	300, 450, 600	PG	X	0.40	—	France
Roman Prince 19	..	120	—	300, 600	PG	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Romanstar 19	..	190	Navy	300, 600	PG	N	0.40	—	Great Britain
Romanzotti	..	220	—	300, 800	PG	X	0.05	—	France
Romeo 19	—	300, 600	PG	X	0.40	—	Great Britain
Romera 12	—	300, 450, 600	PG	X	0.40	—	Great Britain
Romet 1	..	150	Compañia Transmediterranea, Barcelona	300, 600	PG	X	0.30	3.00	Spain

Line	Ship	Year	Company	Port of Origin	Port of Destination	Agent	Remarks
170	MEV	170	Liverpool, Brazil & River Plate Steam Navigation Co., Ltd.	Liverpool	Brazil & River Plate	—	—
400	AWE	400	(Armateurs) D/S A/S Britannia, Bergen	Bergen	—	—	—
125	AVD	125	(Armateur) A. O. Lindvig, Christiania	Christiania	—	—	—
200	KIDR	200	U.S. Shipping Board, Washington (D.C.)	Washington	—	—	—
250	VXQ	250	—	—	—	—	—
539	TSA	539	(Armateur) N. Bugge, Tønsberg	Tønsberg	—	—	—
145	GCLS	145	—	—	—	—	—
—	BQE	—	—	—	—	—	—
130	GDQK	130	—	—	—	—	—
150	OCB	150	—	—	—	—	—
150	PHM	150	—	—	—	—	—
150	PIA	150	—	—	—	—	—
—	NERX	—	—	—	—	—	—
150	XMV	150	—	—	—	—	—
150	FHQ	150	—	—	—	—	—
140	ITE	140	—	—	—	—	—
—	GELZ	—	—	—	—	—	—
190	IAL	190	—	—	—	—	—
190	UPL	190	—	—	—	—	—
250	GJW	250	—	—	—	—	—
190	IXX	190	—	—	—	—	—
—	LKL	—	—	—	—	—	—
110	MTQ	110	—	—	—	—	—
250	VGCF	250	—	—	—	—	—
200	WWR	200	—	—	—	—	—
120	YGE	120	—	—	—	—	—
135	BND	135	—	—	—	—	—
75-100	TSC	75-100	—	—	—	—	—
200	DEI	200	—	—	—	—	—
150	FHR	150	—	—	—	—	—
—	—	—	—	—	—	—	—
100	TKN	100	—	—	—	—	—

Shipboard Stations - Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per-Word.	Minimum per Radio-telegram.	
Rosier ¹⁹	GBZM	250	—	300, 600	P G	N	0.40	—	Great Britain
Roseworth ¹⁹	GCZX	—	—	300, 600	P G	X	0.40	—	Great Britain
Rosignano ¹⁷	IZM	190	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Rosina ¹	THR	100-150	S. G. Embiricos, Cardiff	300, 600	P G	X	0.40	4.00	Greece
Rosta ¹	FHY	150	Victor Fourny, Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Ross	GFEW	175	Navy	300, 600	P G	X	—	—	Great Britain
Rossetti ¹⁹	MEY	—	—	300, 600	P G	X	0.40	—	Great Britain
Rossin ¹⁹	YDI	180	—	300, 600	P G	X	0.40	—	Great Britain
Rosstrevor ⁷¹	YWB	135	London Midland & Scottish Ry. Co.	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Rota OWS ¹	OWS	—	Navy	600	O ⁸	N	—	—	Denmark
Rota OYK ¹	OYK	150	Aktieselskabet Dampskibsselskabet Rota, Copenhagen	300, 600	P ¹	0800 to 0900 1200 to 1300 1800 to 1900	0.40	4.00	Denmark
Rota SBT	SBT	—	Navy	—	O ³⁹	—	—	—	Sweden
Rotarian ^{9 121}	KDCF	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Rotentals ¹⁹	EQY	—	—	300, 600	P G	X	0.40	—	Great Britain
Rother	GKON	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G	X	—	—	Great Britain
Rotherhill ⁷¹	GDXW	—	—	—	P G	X	0.40	—	Great Britain
Rothley ¹⁹	EPE	125	Union S.S. Co. of N.Z. Ltd.	300, 600	P G	X	0.40	—	Great Britain
Rotomahana ³	VMN	250	—	300, 600	P G	X	0.20	—	New Zealand
Rotterdam PEA ¹	PEA	Day 500 Night	Nederlandsche - Amerikaansche Stoomvaart-Maatschappij Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800, 1,800	P G	N	0.40	4.00	Holland
Rotterdam PHH ¹	PHH	150	American Petroleum Co., Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Rotti ¹	PHC	250	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland
Roubix ¹	FKX	200	Union Maritime France-Algérie, 11, Quai du Havre, Rouen	300, 450, 600	P G	X	0.40	—	France
Rouen FZR ³⁴	FZR	150	Administrations des Chemins de Fer de l'Etat, Paris	300, 600	P G	X	0.15	3.50	France
Rouen XEI ¹⁹	XEI	130	—	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain

Roumanier ¹⁶	ORR	100-150	Lloyd Koyai Beige (Antwerp)	300, 600	P G	X	0.40	4.00	Great Britain
Roumelian ¹⁶	ZPG	145	—	300, 600	P G	X	0.40	—	Great Britain
Rounton ¹⁶	XFJ	130	—	300, 600	P G	X	0.40	—	Great Britain
Rounton Grange ¹⁹	ZER	140	—	300, 600	P G	X	0.40	—	Russia
Roussanoff	RBH	150	Compagnie Générale Transatlantiques, Paris	300, 600	O	X	0.40	—	France
Roussillon ¹⁰	FXV	400	—	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	0.40	—	Italy
Rovato ¹⁷	IVY	190	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Roverbella ¹⁷	IZN	190	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Rovereto ¹⁷	IEG	190	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Rovigno ¹⁷	IOA	190	Roma Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Rowan ¹⁹	NKR	—	Rome Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Rowanpark ¹⁹	GFCR	175	—	300, 600	P G	X	0.40	—	Great Britain
Rowena GEMB	GEMB	—	Navy	—	P G	—	—	—	Great Britain
Rowena TSJ ¹	TSJ	150	(Armateurs) A/S det Selmerske Rederi, Trondhjem	300, 450, 600	P G	X	0.40	4.00	Norway
Roxburgh ¹⁹	EJH	—	—	300, 600	P G	X	0.40	—	Great Britain
Roxen ¹	SDZ	250	Rederiaktiebolaget Bore, Gothenburg	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Royal Arrow ^{9 151}	KSW	300	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	N	0.40	—	United States of America
Royal City ¹⁸	GEMF	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Royalite ²¹	VBQ	200	Imperial Oil Ltd., Toronto, (Ont.)	300, 600, 800	P	—	0.40	—	Canada
Royal Oak	GECM	—	Navy	—	P G	—	—	—	Great Britain
Royal Prince ¹⁹	YIH	160	—	300, 600	P G	X	0.40	—	Great Britain
Royal Sceptre ¹⁹	BFE	140	—	300, 600	P G	X	0.40	—	Great Britain
Royal Scot ¹⁹	ZTJ	—	—	300, 600	P G	—	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Royal Sovereign	GRZ	—	Navy	—	P G	—	—	—	Great Britain
Royalstar ¹⁹	ZEC	150	—	300, 600	P G	X	0.40	—	Great Britain
Royal Transport ¹⁹	ZAE	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Royston Grange ¹⁹	GRZS	150	—	300, 600	P G	X	0.40	—	Great Britain
Kozan Maru	JOZ	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Rozenburg ¹	PZS	200	Stoombootrederij de Goede Verwachting, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Ruahine ¹⁹	MKA	200	—	300, 600	P G	X	0.40	—	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Ruapehu ¹⁹	MKB	250	—	300, 600	P G	X	0.40	—	Great Britain
Rubens ¹⁹	GBCY	—	—	300, 600	P G	X	0.40	—	Great Britain
Ruby ²	KOBC	—	American Transportation Co., 17, State Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Rudolf ²⁵	DHG	120	—	300, 450, 600	P G	X	0.40	4.00	Germany
Rudolf Albrecht ²⁵	DRZ	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Rugby ³⁵	GFEX	200	Navy	300, 450, 600	P G	X	—	—	Germany
Rugen ³⁵	DRC	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Rugia ³⁵	DOS	400	—	300, 600	P G	N	0.40	4.00	Germany
Rumania ¹⁹	GJKB	—	—	300, 450, 600	P G	X	0.40	—	Germany
Rumney ¹⁹	EPI	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Rumphus ¹	PMK	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	— ⁴⁴	0.40	4.00	Dutch East Indies
Runic ¹⁹	MWC	250	—	300, 450, 600, 2,100, 2,200	P G	X	0.40	—	Great Britain
Runo ¹⁹	GDNW	125	—	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Rush ²	WNR	250	Everett Packing Co.	300, 440, 555, 600	P G	X	0.20 ¹¹¹	—	United States of America
Rushville ⁹⁷	KUDS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Russ OHE ¹	OHE	100	Aktieselskabet Transport-Og Bjergningselskabet Union, Copenhagen	300, 450, 600	P G	X	— ²	— ²	Denmark
Russ OIR ⁴⁰	OIR	250	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Rüstringen ¹	AKS	—	Navy	300, 600	O	N	—	—	Germany
Rutenfjell ¹	AUH	150-175	(Armateur) J. Johannessen, Farsund	300, 600	P G	X	0.40	4.00	Norway
Ruth AVC ¹	AVC	300	(Armateur) Hagb Waage, Christiansia	300, 600	P G	X	0.40	4.00	Norway
Ruth DRV ²⁵	DRV	200	A. H. Bull S.S. Co., 17, Battery Place, New York (N.Y.)	300, 450, 600	P G	X	0.40	4.00	Germany
Ruth KZQ ¹⁰³	KZQ	200	Robert Dollar Company, San Francisco (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
Ruth Alexander ^{9 221}	WDR	300	A. W. Frost Admiralty	300, 450, 600	P G	X	0.40	—	United States of America
Ruth E. Merrill ²	KQU	200	—	300, 450, 600	P G	X	—	—	United States of America
Ruthenia ²¹	GDYL	80	—	300, 600	P	X	0.40	—	Great Britain
Ruth Kayser ³⁵	DRK	200	—	300, 600	P G	X	0.40	4.00	Germany
Ruud ¹	PDNI	150	Stoomvaart-Maatschappij Noordzee Amsterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (call Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
S.21 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.22 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.23 AEA ¹	..	—	Navy	—	O ..	N	—	—	Germany
S.23 NINM ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.24 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.25 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.26 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.27 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.28 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.29 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.30 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.31 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.32 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.33 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.34 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.35 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.36 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.37 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.38 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.39 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
S.40 ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America

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S.41 ⁸⁹	NIPN	—	Navy	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.42 ⁸⁹	NIPP	—	Navy	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.43 ⁸⁹	..	..	NIPP	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.44 ⁸⁹	..	..	NIPQ	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.45 ⁸⁹	..	..	NIPR	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.46 ⁸⁹	..	..	NIPS	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.47 ⁸⁹	..	..	NIPT	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.48 ⁸⁹	..	..	NIPV	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.49 ⁸⁹	..	..	NIPX	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.50 ⁸⁹	..	..	NIPZ	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.51 ⁸⁹	..	..	NIQK	—	Navy	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
Saar ³⁵	..	200	DRO	..	Lage & Irmãos, Rio de Janeiro	..	..	300, 450, 600	P G	..	X	0.40	Germany
Sabará ¹⁵	..	60	STN	..	Compañia Naviera Vascongada,	..	..	300, 600	P G	..	X	0.40	Brazil
Sabina ¹	..	150	TOX	..	Bilbao	..	..	300, 600	P G	..	X	0.30	Spain
Sabine ¹⁸⁸	..	300	KEB	..	Mallory S.S. Co., Pier 36, North	..	..	300, 450, 600	P G	..	N	0.40	United States of America
Sabine Sum ^{9 181}	..	300	WLQ	..	River, New York (N.Y.)	..	..	300, 450, 600	P G	..	X	0.40	United States of America
Sable	..	—	GEMC	..	Sun Company	..	..	..	P G	..	—	—	Great Britain
Sable I ²¹	..	250	XV	..	Navy	..	..	300, 600	P G	..	—	0.49	Canada
Sabor ¹⁹	..	—	GBQW	..	James Farquhar & Co., Halifax	..	..	300, 600	P G	..	N	0.40	Great Britain
Sabotawan ⁸⁷	..	300	KUJJ	..	(N.S.)	..	..	300, 600	P G	..	N	0.40	United States of America
Sabre	..	—	GEMF	..	U.S. Shipping Board, Washington	..	..	..	P G	..	—	—	Great Britain
Sabrina	..	—	GEMD	..	(D.C.)	..	..	..	P G	..	—	—	Great Britain
Sac ¹	..	150	TMT	..	Navy	..	..	300, 600	P G	..	N	0.30	Spain
Sac ²	..	200	CMAA	..	Sociedad Anonima Cros, Barcelona	..	..	300, 450, 600	P G	..	N	0.40	United States of America
Sac City ¹⁰⁵	..	300	KEFB	..	Sociedad Anonima Cros, Barcelona	..	..	..	P G	..	N	—	United States of America
Sacandaga ^{9 121}	..	300	KESC	..	U.S. Shipping Board, Washington	..	..	300, 450, 600	P G	..	X	0.40	United States of America
Sacarappa ¹⁰³	..	300	WGOI	..	(D.C.)	..	..	300, 600	P G	..	X	0.40	United States of America
Sacavem ⁶¹	..	100-150	CUZ	..	U.S. Shipping Board, Washington	..	..	300, 600	P G	..	N	0.40	Portugal
Sachem ¹⁹	..	175	MOL	..	(D.C.)	..	..	300, 600	P G	..	N	0.40	Great Britain
Sachsenwald ³⁵	..	200	DSW	..	—	..	..	300, 600	P G	..	N	0.40	Germany
Saco ⁹⁷	..	300	KEPT	..	U.S. Shipping Board, Washington	..	..	300, 450, 600	P G	..	X	0.40	United States of America
Sacramento KVV ^{9 121}	..	200	KWV	..	(D.C.)	..	..	300, 600	P G	..	X	0.20	United States of America
Sacramento NQV ⁹⁹	..	—	NQV	..	Sacramento Steamship Company, 52, Broadway, New York (N.Y.)	..	..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Sado ¹¹	..	100-150	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G ..	X	0.40	4.00	Portugal
Sado Maru ¹	..	400		300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
S. Adresse ¹	..	200		300, 600	P G ..	X	0.40	—	France
Sel	..	—	Compagnie Générale Transatlantique, Paris	—	O ..	—	—	—	Norway.
Selen ¹	..	Day	Navy	600	O ³ ..	X	—	—	Denmark
S. Africa ³	..	240	Cape Explosives, Ltd.	300, 600	P G ..	X	0.20 ⁸ 0.40 ⁸	—	South Africa (Union of)
S. Africa ³	..	Night	..	..	..	..	..	..	..
Saga JWL ¹	..	800	Navy	—	O ..	—	—	—	Japan
Saga Maru ¹	..	200	The "Sun," Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1800 2000 to 2400	0.40	—	Japan
Saga SFB ¹	..	150	Rederiaktiebolaget Svenska Lloyd, Gothenburg (Gothenburg-London Line)	300, 600	P G ..	N	0.40	4.00	Sweden
Sagadahoc ^{9 121}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Sagaland ¹	..	100-150	(Armateur) Rich Amlic, Haugesund	300, 600	P G ..	X	0.40	4.00	Norway
Sagana River ¹²	..	160	..	300, 600	P G ..	X	0.40	—	Great Britain
Sagapora ¹⁰³	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Sagatind ¹	..	200	(Armateurs) Finn, Fris & C. O. Lund, Drammen	300, 600	P G ..	X	0.40	4.00	Norway
Sag Harbor ¹⁰³	..	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Sagittaire ¹	..	250	Société Nouvelle des Pêcheries à Vapeur, Arcachon	300, 600	P G ..	X	0.40	—	France
Sagittario	..	—	Navy	—	..	—	—	—	Italy
Sagoland ¹	..	350	Angfartygsaktiebolaget Tifning, Gothenburg	300, 600	P ..	0800 to 0830 1200 to 1230 2000 to 2030	0.40	4.00	Sweden

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Sagona	300	KVO	Atlantic Fruit Co., 61, Broadway, New York (N.Y.)	300, 600	P G	N	0.40	United States of America
Sagua ¹⁰³	300	KEKL	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Saguache ^{9 131}	150	VBP	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	— ²⁷	0.40	Canada
Saguenay ²¹	180	EEO	Compañia Transmediterranea, Barcelona	300, 600	P G	N	3.00	Spain
Sagunto ^{1 11}	300	KEPR	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Sahale ^{9 131}	200	JEV	Osaka Shosen Kaisha (Osaka Merchantile Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Saigon Maru ¹	400	JEZ	Katsuda Kisen Kabushiki Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Saikai Maru ¹	—	YRT	—	300, 450, 600	P G	X	0.40	Great Britain
Sailor Prince ¹⁹	180	UIQ	Veron & Cie (Armateurs), La Rochelle	300, 600	P G	X	0.40	France
Saintonge ¹	400	JKI	Minami Manshu Tetsudo Kaisha (South Manchurian Railway Company)	300, 600	P G	N	0.40	Japan
Sakaki Maru ¹	—	FBKH	Navy	300, 800	P G	N	0.05	France
Sakalave ¹¹	100	JBK	Nihon Kaijo Kogyo Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Sakigake Maru No. 3 ¹	300	KURP	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Salaam ¹⁰³	200	TWB	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450, 600, 800	P G	X	0.40	Holland
Salabangka ¹	—	YIV	Navy	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Great Britain
Salacia ¹⁹	160	GEMJ	—	300, 600	P G	—	0.40	Great Britain
Saladin ¹¹	—	ZMU	—	300, 600	P G	—	0.40	Great Britain
Salaga ¹⁹	200	PEZ	Stoomvaart Mij Rotterdamse Lloyd	300, 450, 600, 800	P G	X	0.40	Holland
Salatiga ^{1 11}	—	KEQX	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Salavery ²	200	TWC	"Nederland" Stoomvaart Mij	300, 450, 600, 800	P G	X	0.40	Holland
Salawati ¹	200	TLF	Compañia Cantabrica de Navegacion, Bilbao	300, 600	P G	N	0.30	Spain
Salazar ^{1 11}	240	MGG	Amalgamated Wireless (Australia), Ltd.	300, 600	P G	N	0.40 ⁹¹	Great Britain
S. Albans ⁷¹	200	TWA	Nederland Stoomvaart Maatschappij, Amsterdam	300, 450, 600, 800	P G	X	0.40	Holland
Saleier ^{1 11}	—	NTP	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Salem ⁹⁹	200	KODR	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Salem County ^{9 131}	—	—	—	—	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs		Country.
							Per Word	Minimum per Radiotelegram.	
Salen ¹	SIR	250	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Salient ¹⁸	EKR	140	—	300, 600	P G	X	0.40	—	Great Britain
Salina IVR ¹⁷	IVR	190	Navigazione Libera Tristina, Trieste	300, 600	P G	X	0.40	—	Italy
Salina KUZQ ⁹⁷	KUZQ	—	U. S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Salinas ⁹⁰	NUGR	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Salland ¹	PZJ	200	Koninklijke Hollandische Lloyd, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Sallavery ¹	HVT	350	Transports Maritimes de l'Etat	300, 600	P G	— ²⁷	0.40	—	France
Sallust ¹⁹	ZQH	155	—	300, 600	P G	X	0.40	—	Great Britain
Salmon	GEMK	—	Navy	—	P G	—	—	—	Great Britain
Salonica AUE ¹	AUE	150-175	(Armateurs) A/S Vendborg Brummenas & Torgesen, Haugesund	300, 600	P G	X	0.40	4.00	Norway
Salonika SKX ¹	SKX	150	Rederiaktiebolaget Sverige-Levanten, Gothenburg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Salta ¹	LEH	150-200	(Armateurs) J. Ludwig Mowinckels, Kelder A/S, Bergen	300, 600	P G	X	0.40	4.00	Norway
Saltash	GFEZ	—	Navy	—	P G	—	—	—	Great Britain
Saltburn	GFB3	—	Navy	—	P G	—	—	—	Great Britain
Saltees ¹⁹	GFMD	—	—	300, 450, 600	P G	X	0.10 ⁹⁷	1.00 ⁹⁷	Great Britain
Salvador EFF ¹	EFF	100	Compañia de Navegacion Salvador, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Salvador Gihir	TOG	150	Compañia Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Salvador ZBV ¹⁹	ZBV	130	(Armateurs) A/S Norsk Bjernings-	300, 600	P G	X	0.40	—	Great Britain
Salvage	LFY	150-200	—	300, 600	P G	X	—	—	Great Britain

Ship	Station	Lat.	Long.	Alt.	Dist.	Time	Country
Salvator DSA ³⁵	DSAL	200	150-250	..	..	..	Germany
Salvator LEM ¹	LEM	150-250	..	..	..	..	Norway
Salvatore ¹⁷	IWA	140	..	..	..	..	Italy
Samara ¹	FSM	300	..	..	..	..	France
Samaria ¹⁰	GJCF	350	..	..	..	..	Great Britain
Samarinida ¹	PGH	100-150	..	..	..	..	Holland
Sambre FBV (La) ¹	FBV	300	..	..	..	..	France
Sambre GGDV ¹⁹	GDV	300	..	..	..	..	Great Britain
S. Ambrose ¹	FOA	300	..	..	..	..	France
Samlund ¹⁰	ORS	150-200	..	..	..	..	Belgium
Samuanger ¹	LCY	150-200	..	..	..	..	Norway
Sampan ⁷¹	EQN	—	..	..	..	..	Great Britain
Sampierdarena ¹⁷	UVX	140	..	..	..	..	Italy
Sampo	OJK	250	..	..	..	..	Finland
Sampson ⁹⁸	NKS	—	..	..	..	..	United States of America
Samson	FASM	—	..	..	..	..	France
Samuel L. Fuller ^{9 131}	KDMS	300	..	..	..	..	United States of America
Samuel Mitchell ^{9 131}	WEJ	200	..	..	..	..	United States of America
Samuel Q. Brown ¹⁰⁹	KDVO	—	..	..	..	..	United States of America
S. Ana TKP ¹	TKP	150	..	..	..	..	United States of America
S. Ana WAL ⁹⁷	WAL	100	..	..	..	..	Spain
S. Ana WBX ^{9 131}	WBX	300	..	..	..	..	United States of America
S. André FQW ¹	FQW	150	..	..	..	..	United States of America
S. André FWU ¹	FWU	200	..	..	..	..	France
S. Andrea ¹⁷	IAO	140	..	..	..	..	France
S. Andrea ¹	TRD	100-150	..	..	..	..	Italy
S. Andrew GCBV ¹⁹	GCBV	—	..	..	..	..	Norway
S. Andrew GYJ ⁷¹	GYJ	120	..	..	..	..	Great Britain
S. Andrews ¹⁹	GBNL	—	..	..	..	..	Great Britain
S. Annaland ¹	OMF	150	..	..	..	..	Holland
S. Anne ¹	FRY	200	..	..	..	..	France
S. Antao ⁶¹	CUW	100-150	..	..	..	..	Portugal
S. Anthony ^{9 131}	KUBM	200	..	..	..	..	United States of America
(Armateurs) A/S Norsk Bjerningskompani, Christiania	300, 600	..	..	..	..	..	..
Gazzolo Angelo Fu, Genoa	300, 600	..	..	..	..	..	..
Compagnie de Navigation Sud-Atlantique, Paris	300, 600	..	..	..	..	..	..
Koninklijke Rotterdamse Lloyd, Rotterdam	300, 450, 600, 800	..	..	..	..	..	..
Maurel Frères, Bordeaux	300, 450, 600	..	..	..	..	..	..
Société Navale de l'Ouest, Paris	300, 600	..	..	..	..	..	..
Soc. Anon. Belgo-Américaine de Navigation, Antwerp	300, 600	..	..	..	..	..	..
(Armateurs) Westlarsen & Co., A/S, Bergen	300, 600	..	..	..	..	..	..
Operated by the Denary Shipping and Commercial Co., Ltd.	300, 600	..	..	..	..	..	..
Pittaluga Pietro fu G., Genoa	300, 600	..	..	..	..	..	..
Ice-Breaker belonging to the State Navy	400, 600	..	..	..	..	..	..
Navy	300, 800	..	..	..	..	..	..
Sinclair Navigation Co., 120, Broadway, New York (D.C.)	300, 600	..	..	..	..	..	..
Huron Transportation Co., Detroit (Mich.)	300, 600	..	..	..	..	..	..
Tide Water Company	300, 450, 600	..	..	..	..	..	..
Hijos de José Iaya, Barcelona	300, 600	..	..	..	..	..	..
Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 600	..	..	..	..	..	..
Grace S.S. Co., Inc., 7, Hanover Square, New York (N.Y.)	300, 450, 600	..	..	..	..	..	..
Compagnie Générale Transatlantique, Paris	300, 600	..	..	..	..	..	..
A. Coppin & Cie. (Armateurs), Boulogne-sur-Mer	300, 600	..	..	..	..	..	..
Ravano and Corrado, Genoa	300, 600	..	..	..	..	..	..
(Armateur) A/S, Bonheur, Fred Olsen & Co., Christiania	300, 600	..	..	..	..	..	..
Rankin, Gilmour & Co., ..	300, 600	..	..	..	..	..	..
Fishguard and Rosslare Harbours and Railways Company	300, 600	..	..	..	..	..	..
Scheepvaart en Steenkolen Maatschappij, Rotterdam	300, 600	..	..	..	..	..	..
Société Maritime Auxiliaire de Transports, Nantes	300, 600	..	..	..	..	..	..
U.S. Shipping Board, Washington (D.C.)	300, 600	..	..	..	..	..	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
S. Antonio KOMN ²	KOMN	200	American Finance and Commerce Company	300, 600	P G ..	X	0.40	—	United States of America
San Antonio XBE ¹	XBE	130	Compañía Mexicana de Vapor, "San Antonio"	300, 600	P G ..	X	0.40	—	Mexico
San Bernardo ¹	XBA	170	Compañía Mexicana de Petroleo "El Aguila"	300, 600	P G ..	X	0.40	—	Mexico
Sauderling ⁹⁹	NIJS	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
Sandgate ¹⁹	GBDL	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Sandgate Castle ⁴⁰	GJBO	350	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Sandheads ¹	VWS	200	River Hooghly Pilot Vessel	600	P G ..	X ³³	0.40	—	Great Britain
Sandhurst	GEYF	—	Navy	—	P G ..	—	—	—	India
Sandon Hall ¹⁹	GDPY	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Sandown Castle ¹⁹	GFBW	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Sandpiper ⁹⁹	NIKK	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
Sands ⁹⁹	NULQ	—	Navy	300, 600	P G ..	N	0.20 111 0.40 112	—	United States of America
Sandsyske ⁹⁹	GJCS	100	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
San é	FASN	500	Kokusai Kisen Kaisha	300, 600	P G ..	N	0.05	—	France
Sanfrancisco Maru ¹	JIV	—	—	300, 600	P G ..	N	0.40	—	Japan
Sangamon ²	WJAA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Sangler	FBSC	—	Navy	300, 800	P G ..	N	0.05	—	France
Saugola ¹⁹	GOD	175	—	300, 600	P G ..	X	0.40	—	Great Britain
Saugstad ¹	TSW	100-150	(Armateurs) Aktieselskapet "TO" Christiansand S.	300, 600	P G ..	X	4.00	—	Norway
Saus-Souei	FBJS	—	Navy	300, 800	P G ..	N	0.05	—	France
Sautamania ²	TNO	200	Compañía Naviera Bermeo, Bilbao	300, 600	P G ..	N	0.30	—	Spain
Santanta ²	ZKS	100	Yacht belonging to Osborn Howes, 60, State Street, New York (N.Y.)	300, 600	P G ..	X	—	—	United States of America
Santarém	PUC	100	Lage & Irmãos, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Santarém FXS ¹	FXS	200	Transports Maritimes de l'Etat	300, 600	P G ..	X	0.40	—	France
Santha ¹⁹	GOE	175	C. de Zabala, Bilbao	300, 600	P G ..	X	0.40	—	Great Britain
Santi ¹	TMW	100	New York and Cuba Mail S.S. Co., Pier 13, North River, New York	300, 600	P G ..	N	0.30	—	Spain
Santiago KWE ¹⁰⁹	KWE	150	—	300, 450, 600	P G ..	X	3.00	—	United States of America

Country	Ship	Port	Class	Year	Capacity	Company	Notes	Passenger	Mail	Radio	Light	Signal	Other
Santore	Santos	1	SSY	300	SSY	Lage & Irmãos, Rio de Janeiro	..	300, 600	PG	..	..	..	..
Santore	Santos	2	JPS	400	JPS	Nippon Yusen Kaisha (Japan Mail Steamship Company)	..	300, 600, 1,800	PG	..	..	..	..
Santore	Santos	3	SRC	240	SRC	Lloyd Brasileiro, Rio de Janeiro	..	300, 600	PG	..	..	..	..
Santore	Santos	4	TWE	200	TWE	"Nederland" Stoomvaart Maatschappij	..	300, 450, 600, 800	PG	..	..	..	..
Santore	Santos	5	FBSA	—	FBSA	Navy	..	300, 800	PG	..	..	..	..
Santore	Santos	6	YME	—	YME	Navy	..	300, 800	PG	..	..	..	..
Santore	Santos	7	NUGS	—	NUGS	Navy	..	300, 600	PG	..	..	..	..
Santore	Santos	8	KESG	300	KESG	U.S. Shipping Board, Washington (D.C.)	..	300, 450, 600	PG	..	..	..	..
Santore	Santos	9	MHK	200	MHK	Operated by Vicoount Furness, London	..	300, 600	P	..	..	..	..
Santore	Santos	10	KDUS	—	KDUS	J. D. Adams	..	300, 600	PG	..	..	..	..
Santore	Santos	11	JEI	400	JEI	Imugami Keigoro	..	300, 600	PG	..	..	..	..
Santore	Santos	12	KDCB	—	KDCB	United States Shipping Board, Washington (D.C.)	..	300, 600	PG	..	..	..	..
Santore	Santos	13	ZAU	—	ZAU	Baltimore and Carolina S.S. Co., 607, Union Trust Buildings, Baltimore (Md.)	..	300, 600	PG	..	..	..	..
Santore	Santos	14	WQJ	—	WQJ	United Fruit S.S. Corporation	..	300, 450, 600	PG	..	..	..	..
Santore	Santos	15	KLH	200	KLH	Navy	..	300, 600	PG	..	..	..	..
Santore	Santos	16	EYG	145	EYG	Navy	..	300, 600	PG	..	..	..	..
Santore	Santos	17	NEMD	—	NEMD	Navy	..	300, 600	PG	..	..	..	..
Santore	Santos	18	NELB	—	NELB	Navy	..	300, 600	PG	..	..	..	..
Santore	Santos	19	WLAA	300	WLAA	U.S. Shipping Board, Washington (D.C.)	..	300, 450, 600	PG	..	..	..	..
Santore	Santos	20	IGV	—	IGV	Navy	..	—	PG	..	..	..	..
Santore	Santos	21	IHM	—	IHM	Navy	..	—	PG	..	..	..	..
Santore	Santos	22	INS	190	INS	Societa Italiana Di Servizi Marittimi, Rome	..	300, 600	PG	..	..	..	..
Santore	Santos	23	GBVD	220	GBVD	(Armateurs) A/S Bonheur, Fred Olsen & Co., Christiania	..	300, 600	PG	..	..	..	..
Santore	Santos	24	TRC	100-150	TRC	Navy	..	—	PG	..	..	..	..
Santore	Santos	25	GEML	—	GEML	Navy	..	—	PG	..	..	..	..
Santore	Santos	26	SOK	50	SOK	Navy	..	300	O ¹⁸	..	..	..	..
Santore	Santos	27	TNH	200	TNH	Compania Navigacion Bengolea, Bilbao	..	300, 600	PG	..	..	..	..
Santore	Santos	28	—	—	—	Aktieselskabet, Dampskibsselskabet, Norden, Copenhagen	..	—	PG	..	..	..	..
Santore	Santos	29	VGJC	150	VGJC	Canada S.S. Lines, Ltd., Montreal, (P.Q.)	..	300, 600	P	..	..	..	..
Santore	Santos	30	VBR	200	VBR	Imperial Oil Ltd., Toronto, Ont...	..	300, 600	PG	..	..	..	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Sarps ¹	VKH	300	—	300, 600	PG ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ^s 0.40 ^s	—	Australian Commonwealth
Sarpedon GEMN	GEMN	—	Navy	—	PG ..	—	—	—	Great Britain
Sarpedon PET ¹	PET	150	De Nederlandsche Maatschappij, Ocean, Amsterdam (Armateurs) A/S, Borregaard, Christiania	300, 450, 600, 800	PG ..	X	0.40	4.00	Holland
Sarpen ASA ¹	ASA	200	Navy	300, 600	PG ..	X	0.40	4.00	Norway
Sarpen LBE	LBE	—	—	—	O ..	—	—	—	Norway
Sarthe ¹⁰	GCDW	150	Ernest John Heins, 60, Rue St., Lazare, Paris	300, 600 300, 600	P ..	N — ²⁷	0.40 0.40	—	Great Britain
Saskatoon ²	VGCP	—	—	—	—	—	—	—	Canada
Sassenheim	TYH	150	Maatschappij, Stoomschip, Sassenheim, Rotterdam	300, 450, 600	PG ..	X	0.40	4.00	Holland
Satanta ²	GTG	150	Standard Transport Co., Ltd.	300, 450, 600	PG ..	X	—	—	Hong Kong
Satarta ⁹ 131	KIDC	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Satellite ¹⁵	SRG	190	Lloyd, Brasileiro, Rio de Janeiro	300, 600	PG ..	N	0.40	—	Brazil
Satsuma JGJ ¹	JGJ	—	Navy	—	O ..	—	—	—	Japan
Satsuma KJI ⁹ 131	KJI	150	New York and Oriental S.S. Co.	300, 450, 600	PG ..	X	0.40	—	United States of America
Satterlee ⁹⁰	NAGC	—	Navy	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Saturn ⁹⁹	NNM	—	Navy	300, 600	PG ..	N	0.40 ¹¹² 0.40	—	United States of America
Saturnia ¹⁰	MBF	250	—	300, 600, 2100, 2200 c.w.	PG ..	N	0.40	—	Great Britain
Saturnus ¹	TXJ	150	Koninklijke Nederlandsche Stoomboot Maatschappij, Amsterdam	300, 600	PG ..	X	0.40	4.00	Holland
Satyr	GEMP	—	Navy	—	PG ..	—	—	—	Great Britain
Satyrn ¹⁰³	WBK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Saucetties ⁹⁷	WAB	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	X	0.40	—	United States of America
Saugus ¹⁰³	KIBQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	X	0.40	—	United States of America
S. Augustine ⁹ 131	KIKJ	300	U.S. Shipping Board, Washington	300, 600	PG ..	X	0.40	—	United States of America

Line	Ship	Year	Builder	Country	Value	Notes	Remarks
1	Saumarz	1900	GEKV	France	300,000	Navy	United States of America
2	Saumarz	1900	FRM	France	300,000	Société Maritime Auxiliaire de Transports, Nantes	United States of America
3	Sauro	1900	IBBA	Italy	300,000	Navy	United States of America
4	Sausenburgh	1900	GBNF	Great Britain	300,000	Navy	United States of America
5	Savannah	1900	NGS	Great Britain	300,000	Navy	United States of America
6	Saverne	1900	FDU	France	300,000	Compagnie Les Armateurs Française, Paris	United States of America
7	Savoia	1900	IEH	Italy	300,000	La Veloce Società di Navigazione, Rome	United States of America
8	Savoie FTS	1900	FTS	France	300,000	Compagnie Générale Transatlantique, Paris	United States of America
9	Savoie FVA	1900	FVA	France	300,000	Société Générale des Transports Maritimes à Vapeur, Marseilles	United States of America
10	Savoie FYW	1900	FYW	France	300,000	Armond Coppin & Cie, Boulogne-sur-Mer	United States of America
11	Savona	1900	IWQ	Italy	300,000	Lloyd Del Mediterraneo Società di Navigazione, Rome	United States of America
12	Sawokla	1900	KDBW	United States of America	300,450,000	U.S. Shipping Board, Washington (D.C.)	United States of America
13	Saxicava	1900	GLD	Great Britain	300,450,000	—	United States of America
14	Saxilby	1900	ELW	Great Britain	300,450,000	—	United States of America
15	Saxoline	1900	LTX	Great Britain	300,450,000	—	United States of America
16	Saxon MQI	1900	MQI	Great Britain	300,450,000	Clinchfield Navigation Co., 24, Broad St., New York (N.Y.)	United States of America
17	Saxon WZEA	1900	WZEA	Great Britain	300,450,000	—	United States of America
18	Saxonia	1900	MSA	Great Britain	300,450,000	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	United States of America
19	Saxon Prince	1900	BDC	Great Britain	300,450,000	Société Française d'Armement Frisch & Cie, Marseilles	United States of America
20	Saxonstar	1900	YVY	Great Britain	300,450,000	J. R. Hanify & Co., Paris	United States of America
21	S. Argulf	1900	FAB	France	300,450,000	Société Navale de l'Ouest, Paris	United States of America
22	S. Barbara	1900	WBJ	United States of America	300,450,000	Société Navale de l'Ouest, Paris	United States of America
23	S. Barthélémy	1900	FOY	France	300,450,000	Operated by the Tropical Radio Telegraph Co., 131, State St., Boston (Mass.)	United States of America
24	S. Basile	1900	FOB	France	300,450,000	Standard Oil Co. of N.J. Incorp., 26, Broadway, New York (N.Y.)	United States of America
25	S. Bede	1900	GCET	Great Britain	300,450,000	Tropical Radio Telegraph Co., 131, State St., Boston, Mass.	United States of America
26	S. Benito	1900	GFZQ	Great Britain	300,450,000	(Armateur) Jens G. F. Lund, Bergen	United States of America
27	S. B. Hunt	1900	KIPR	United States of America	300,450,000	Tropical Radio Telegraph Co., 131, State St., Boston, Mass.	United States of America
28	S. Blas	1900	GBWD	Great Britain	300,450,000	—	United States of America
29	S. B. Lund	1900	TQI	Norway	300,450,000	—	United States of America
30	S. Breock	1900	GFZW	Great Britain	300,450,000	—	United States of America
31	S. Bruno	1900	GDWT	Great Britain	300,450,000	—	United States of America
32	Scalaria	1900	GFKZ	Great Britain	300,450,000	—	United States of America
33	Scala Shell	1900	GDCJ	Great Britain	300,450,000	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service formed.	Hours of Service	Ship Charge. France		Country.
							Per Word.	Minimum per Radio-telegram.	
Scaldier ¹⁹	EXI	140	—	300, 600	P G	X	0.40	—	Great Britain
Sally ¹⁰²	KEKC	—	—	300, 600	P G	N	—	—	United States of America
S. Camille ¹	UBD	300	Société Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—	France
Scampolo ¹⁷	IVW	140	Lloyd Sabauda Società Anonima per Azioni, Genoa	300, 600	P G	X	0.40	—	Italy
Scandia ³⁵	DCD	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Scandinavian ¹⁹	MNC	250	—	300, 600	P G	N	0.40	—	Great Britain
Scandinavic ²	SHM	150	Rederiaktiebolaget Baltic-France, Gothenburg	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	Sweden
Scantic ¹⁰³	KILR	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Scarab	GFOV	—	Navy	—	P G	—	—	—	Great Britain
S. Carlo ¹	UGB	300	Société Maritime et Commerciale de France, 66, Rue de La Chaussée Dantin, Paris	300, 600	P G	X	0.40	—	France
S. Carlos ¹	EDQ	250	Compania Transatlantica, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Scarpe	FBSC	—	Navy	300, 800	P G	N	0.05	—	France
S. Caterina	SNK	60	Navy	300	O ¹⁸	N	0.40	—	Brazil
Scatwell	YEQ	140	Navy	300, 600	P G	X	0.40	—	Great Britain
S. Cecilia ¹ 121	WBB	300	Green Star Steamship Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Sceptre	GEMQ	—	Navy	—	P G	—	—	—	Great Britain
Scheer ³⁵	DSJ	200	—	300, 600	P G	X	0.40	4.00	Germany
Schelde ²⁵	DSC	200	—	300, 600	P G	X	0.40	4.00	Germany
Schelde HDZ ¹	HDZ	150	—	300, 600	P G	X	0.40	4.00	Holland
Schelswig ¹	HSW	300	Internationale Sleepdienst, Maatschappij (International Tug Co., Rotterdam)	300, 600	P G	X	0.40	—	France
Schenck ¹⁰	NEMG	—	Transports Maritimes de l'Etat	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Schenectady ¹ 121	WJIU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Schie ¹	PEP	150	Naamlooze Venootschap Hout-vaart, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Schiedijk ¹	PIQ	200	Nederlandsche - Ametkaansche Stoomvaart - Maatschappij (Holland-Amersia Line Rotterdam)	300, 450, 600, 800	P G	X	0.40	4.00	Holland

	Omer	No.	Name	Company	Value	Paid	Currency	Country
Schotland ¹	OME	150	Scheepvaart-Transport Maatschap-pij, Atlantica, Rotterdam	Navy	300, 600	P G	—	Holland
Schlesien AMC ¹	AMC	—	—	—	—	O	—	Germany
Schlesien DLO ³⁸	DLO	200	—	—	300, 450, 600, 800	P G	0.40	Germany
Schleswig-Holstein ¹	AME	—	—	—	—	O	—	United States of America
Schley ⁹⁸	NKT	—	—	—	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Schodack ^{9 131}	KEVT	300	U.S. Shipping Board, Washington (D.C.)	—	300, 600	P G	0.40	United States of America
Schoharie ⁹⁷	KEVV	300	U.S. Shipping Board, Washington (D.C.)	—	300, 450, 600	P G	0.40	Great Britain
Scholar ¹⁹	GJLV	—	—	—	300, 450, 600	P G	0.40	United States of America
Schoodic ¹⁰³	KIDQ	300	U.S. Shipping Board, Washington (D.C.)	—	300, 450, 600	P G	0.40	Holland
Schoouwen	OLS	150	Stoomvaart Maatschappij Triton, Rotterdam	—	300, 600	P G	0.40	United States of America
Schroon ¹⁰³	KIJM	300	U.S. Shipping Board, Washington (D.C.)	—	300, 600	P G	0.40	United States of America
Schyvkill Bridge ⁹⁷	KIKC	300	U.S. Shipping Board, Washington (D.C.)	—	300, 450, 600	P G	0.40	Germany
Schwarzwald ³⁸	DUP	200	—	—	300, 450, 600	P G	0.40	Italy
Scientist ¹⁹	GXD	300	Fratelli Bianchi di S., Genoa	—	300, 600	P G	0.40	Great Britain
Scillin ¹⁷	IVC	140	Navy	—	300, 600	P G	—	Great Britain
Seimtar	GEMR	175	Navy	—	300, 600	P G	0.40 ¹¹¹ 0.20 ¹¹²	United States of America
Sciadia ¹⁸	MHJ	—	—	—	300, 600	P G	—	Great Britain
Sciota ⁸⁹	NEVK	—	—	—	300, 600	P G	—	Great Britain
Scipio ¹⁹	ODR	115	—	—	300, 600	P G	—	United States of America
Scirio ⁵⁰	GEMS	100	Atlantic & Pacific S.S. Co., New York (N.Y.)	—	300, 600	P G	0.10 ⁸⁷	Great Britain
S. Clara ^{9 131}	WBA	200	Hanover Sq., New York (N.Y.)	—	300, 600	P G	0.40	United States of America
Scopas ¹	OMA	200	Nederlandsche Indische Tank-stoomboot Maatschappij, The Hague	—	300, 600	P G	0.40	Holland
Scorpion ⁸⁹	NTT	—	—	—	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Sootia GDRW ⁷¹	GDRW	—	Operated by the London Midland & Scott's Railway Co.	—	300, 800	P G	0.10 ⁸⁷	Great Britain
Sootia SFD ¹	SFD	250	Rederiaktiebolaget Svenska Lloyd, Gothenburg	—	300, 600	P	0.40	Sweden
Scotian ¹⁹	MJN	200	—	—	300, 600	P G	0.40	Great Britain
Scottman ¹⁹	GEMS	—	—	—	300, 600	P G	0.40	Great Britain
Scottier ¹⁹	ZRR	155	—	—	300, 600	P G	0.40	Great Britain
Scottish American ¹⁹	GDSM	—	—	—	300, 600	P G	0.40	Great Britain
Scottish Bard ¹⁹	BOR	150	—	—	300, 600	P G	0.40	Great Britain
Scottish Maiden ¹⁹	GFOV	—	—	—	300, 450, 600	P G	0.40	Great Britain
Scottish Minstrel ¹⁹	GFOX	—	—	—	300, 450, 600	P G	0.40	Great Britain
Scottish Monarch ¹⁹	ERS	180	—	—	300, 600	P G	0.40	Great Britain
Scottish Musician ¹⁹	GFQY	—	—	—	300, 450, 600	P G	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radio-telegram.	
Scottish Prince ¹⁹	YXV	145	—	300, 600	PG	N	0.40	—	Great Britain
Scottish Standard ¹⁹	GFQV	—	—	300, 600	PG	X	0.40	—	Great Britain
Scottish Strath ¹⁹	GJMR	—	—	300, 450, 600	PG	X	0.40	4.00	Great Britain
Scottsburg ² ¹³¹	KOMM	300	—	300, 450, 600	PG	X	0.40	—	United States of America
Scouratov	RBL	150	—	300, 600	O	X	0.40	—	Russia
Scout	GEMT	190	—	300, 600	PG	X	0.40	—	Great Britain
Servia ¹⁷	IMU	—	—	300, 600	PG	X	0.40	—	Italy
S. Cruz LRX ¹ ..	LRX	—	Government Ship (Department of Agriculture)	450, 600	O	N	—	—	Argentine Republic
S. Cruz WBD ⁹ ¹³¹	WBD	200	Atlantic & Pacific S.S. Co., ⁷ Hanover St., New York (N.Y.)	300, 450, 600	PG	N	0.40	—	United States of America
S. C. T. Dodd ⁹ ¹³¹	KDML	300	Standard Oil Co. of California, Incorp., Sheldon Building, San Francisco (Cal.)	300, 600	PG	X	0.40	—	United States of America
S. Cyrille ¹	FOK	300	Société Navale de l'Ouest, Paris	300, 600	PG	X	0.40	—	France
S. Cyrus ..	GLEK	—	Navy	—	PG	—	—	—	Great Britain
Seythe ..	GEMV	—	Navy	—	PG	—	—	—	Great Britain
Seythia ⁵⁰	GDYP	350	—	—	PG	N	0.40	—	Great Britain
Seythian ¹⁹	ZGW	155	—	300, 450, 600, 2,100, 2,200 CW	PG	N	0.40	1.00 ⁸⁷	Great Britain
S. David ²¹	GYL	120	—	300, 600	PG	N	0.10 ⁸⁷	—	Great Britain
S. Denis ²¹	ZCK	120	Fishguard and Rosslare Harbours and Railways Co.	300, 450, 600	PG	N	0.40	—	Great Britain
S. Didier ¹	FOI	300	Great Eastern Railway Co.	300, 600	PG	N	0.40	—	Great Britain
S. Diego ²	KUBF	200	Société Navale de l'Ouest, Paris, W. H. Wood, 1, Drumm Street, San Francisco (Cal.)	300, 600	PG	X	0.40	—	United States of America
S. Dunstan ¹⁹	YEL	160	—	300, 600	PG	X	0.40	—	Great Britain
S. Dunstano ¹⁹	MAN	160	—	300, 600	PG	X	0.40	—	Great Britain
Seabank ¹⁹	BUW	140	—	300, 600	PG	X	0.40	—	Great Britain
Seabear	GEMW	—	—	300, 600	PG	X	0.40	—	Great Britain
Seacommet ⁹ ¹³¹	KJOU	150	Seacommet S.S. Company	300, 600	PG	X	0.40	—	Great Britain
Seafire	GEMX	—	Navy	300, 600	PG	X	0.40	—	United States of America
Sea Glory ¹⁹	ZYG	125	—	300, 600	PG	X	0.40	—	Great Britain
Seagull ⁹⁹	NIJM	—	Navy	300, 600	PG	X	0.40	—	Great Britain

Sea King ²	VRO	125	Baron Bliss J. P. Nassau, Bahamas	300, 450, 600	—	—	Newfoundland
Sea Lion ¹	VYE	200	—	300, 600	PG	0.40	Great Britain
Sealdia ¹⁹	GOF	150	Ship Owners and Merchants Tug-boat Company	300, 600	PG	0.20	United States of America
Seamew ²¹	LSE	150	General Steam Navigation Co., Ltd.	300, 600	PG	—	Great Britain
Sea Monarch ²	KDQU	200	Ship Owners and Merchants Tug-boat Company	300, 600	PG	0.40	United States of America
Seang Bee ¹⁵	VWCB	200	Lin Chin Tsong (Seang Line)	300, 600	PG	0.40	India
Seapal ¹⁹	ZWC	160	Ship Owners and Merchants Tug-boat Company	300, 600	PG	0.40	Great Britain
Sea Ranger ²	KDSQ	150	Navy	300, 450, 600	PG	—	United States of America
Searcher ²²	GEMY	—	Navy	—	PG	0.20 ¹¹¹	Great Britain
Sea Rover ²⁹	NEX	—	Navy	300, 600	PG	0.40 ¹¹²	United States of America
Sea Scout ²	KDSY	—	Ship Owners and Merchants Tug-boat Company	300, 600	PG	—	United States of America
Sea Serpent ¹⁸	ZIH	115	—	300, 600	PG	0.40	Great Britain
Seatonia ¹⁸	BUU	—	Navy	300, 600	PG	0.40	Great Britain
Seattle NAPG ²⁹	NAPG	—	—	300, 600	PG	0.20 ¹¹¹	United States of America
Seattle ZJA ²²	ZJA	200	Union Government of South Africa	300, 600	PG	0.40 ¹¹²	Great Britain
Seattle Maru ¹	JST	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	0.40	Japan
Seattle Spirit ²⁷	KISD	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	0.40	United States of America
Sea Victory ²¹	GCTW	125	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	PG	0.40	Great Britain
Seawolf	GEMZ	—	Navy	—	PG	—	Great Britain
Sebago ¹⁸	NUV	—	Navy	300, 600	PG	0.20 ¹¹¹	United States of America
Sebara ²⁵	DIB	400	F. Sanz é Inchaustegui, Bilbao	300, 450, 600	PG	0.40	Germany
Sebastian ¹	TKQ	200	—	300, 600	PG	0.30	Spain
Sebastiano Caboto	IGZ	—	Navy	—	PG	—	Italy
Sebonac ¹⁸²	KUVF	200	Thomas A. Howell	300, 450, 600	PG	0.20	United States of America
Sebu ¹	PEF	120	Stoomvaart, Maatschappij Atlas, Rotterdam	600, 800	PG	0.40	Holland
S. E. Calvert ¹⁹	GBTY	200	Transports Maritimes de l'Etat	300, 600	PG	0.40	Great Britain
Secundus ¹	UEE	—	Standard Oil Company of New York, Incorp., 26, Broadway, New York (N.Y.)	300, 600	PG	0.40	France
Security ²¹³¹	KSJ	200	—	300, 600	PG	—	United States of America
Sedge Pool ¹⁹	XEW	120	—	300, 600	PG	0.40	Great Britain
Sedov	RBM	150	—	300, 600	PG	0.40	Russia
S. Eduardo ¹⁹	MSV	160	—	300, 600	PG	0.40	Great Britain
Séduisant	FBPS	200	Navy	300, 800	PG	0.05	France
Seadler DSD ²⁵	DSD	—	Reederei W. Schuchman, Geste- munde	300, 600	PG	0.40	Germany
Seadler DSE ²⁵	DSE	200	Norddeutscher Lloyd, Bremen	300, 600	PG	0.40	Germany
Seandbec ²¹³¹	WTS	100	Cleveland and Buffalo Transit Co., Cleveland (Ohio)	300, 450, 475, 600	PG	0.20	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs		Country.
							Per Word.	Minimum per Radio-telegram.	
Sechund ³⁵	DSH	200	—	300, 600	P G	X	0.40	4.00	Germany
Seekonk ^{9 131}	KIGF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Seefowe ³⁵	DAF	200	—	300, 600	P G	X	0.40	4.00	Germany
Seemöwe ³⁵	DAG	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Seestern ³⁵	DSS	200	(Armateur) D/S. A/S. Otto Thoresens Linie, Christiania	300, 600	P G	X	0.40	4.00	Germany
Segovia ¹	TRF	100, 150	Standard Oil Co. of California, Incorp., Sheldon Building, San Francisco (Cal.)	300, 600	P G	X	0.40	4.00	Norway
Segundo (El) ^{9 131}	WTQ	300	—	300, 600	P G	X	0.40	—	United States of America
Segura ¹⁹	ZFG	—	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	300, 600	P G	X	0.40	—	Great Britain
Seikai Maru ¹	JSW	200	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Seine I ¹	FAIS	—	Navy	300, 800	P G	N	0.05	—	France
Seine Maru ¹	JALA	400	Teikoku Kisen Kaisha	300, 600	P ^a	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Seirstad ¹	ARH	200, 250	(Armateurs) A. F. Klaveness & Co., Christiania	300, 600	P G	X	0.40	4.00	Norway
Seistan	GVBMI	—	—	—	—	—	—	—	Hong Kong
Seivo Maru ¹	JSY	400	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	P G	N	0.40	—	Japan
Sekko Maru ¹	JOJ	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Sekstant ¹	TPH	200	(Armateur) Johan Troye, Hansen, Bergen	300, 600	P G	X	0.40	4.00	Norway
Selandia ⁴⁰	OZF	350	Aktieselskabet det Ostasiatiske Kompagni, Copenhagen	300, 450, 600, 800	P G	X	0.40	4.00	Denmark
Selene ¹	PDW	150	Petroleum Maatschappij la Corona, The Hague	300, 600	P G	X	0.40	4.00	Holland
Seifridge ⁹⁸	NUJZ	—	Navy	300, 600	P G	N	0.40 ¹¹¹ 0.40 ¹¹²	—	United States of America

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs		Country.
							Per Word.	Minimum per Radio-telegram.	
Sergipe SNO	SNO	60	Navy	300	O ¹⁸	—	0.40	—	Brazil
Sergipe SRH ¹⁵	SRH	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	PG	N	0.40	—	Brazil
Serrano CBO	CBO	150	Navy	—	—	—	—	—	Chile
Servian Prince ¹⁹	YTR	190	Lloyd Brasileiro, Rio de Janeiro	300, 600	PG	N	0.40	—	Great Britain
Servulo Dourado ¹⁵	SRR	190	Navy	300, 600	PG	N	0.40	—	Brazil
Sesame GENEK	GENK	190	Ente Trasporto Coton, Genoa	300, 600	PG	X	—	—	Great Britain
Sestri ¹⁷	IZK	—	Navy	—	O	—	0.40	—	Italy
Seta ¹	IWA	—	—	—	O	—	—	—	Japan
Settler ¹⁹	YAF	—	Navy	300, 600	PG	X	0.40	—	Great Britain
Settsu ¹	JGM	150	American & Cuban S.S. Line, 39, Cortland St., New York (N.Y.)	300, 450, 600	O	X	—	—	United States of America
S. Eulalia ^{9 131}	KDDY	150	Union Sulphur Co., 82, Beaver St., New York (N.Y.)	300, 600	PG	X	0.40	—	United States of America
Severance ⁹⁷	KXOE	150	Operated by the Brand-Adams S.S. Co., Ltd., Prudential Buildings, Newcastle	300, 600	PG	N	— ¹¹⁸	—	United States of America
Severn ¹⁹	GBOT	170	—	300, 600	PG	X	0.40	—	Great Britain
Severnmede ⁷¹	ELI	—	—	300, 600	PG	X	0.40	—	Great Britain
Sevilla GFJY ¹⁸	GFJY	350	Chr. Salvesen & Co., 29, Bernard Street, Leith, Edinburgh	300, 450, 600	PG	X	0.40	—	Falkland Islands
Sevilla TRE ¹	TRE	100, 150	(Armateur) D/S A/S Otto Thorens Line; Christiana	300, 600	PG	X	0.40	4.00	Norway
Sevre ¹	FAZ	300	Compagnie Nautique de Navigation à Vapeur, Nantes	300, 600	PG	X	0.40	—	France
Sewalls Point ^{9 131}	KGX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	X	0.40	—	United States of America
Seydlitz ³⁵	DSY	200	Navy	300, 600	PG	N	0.40	4.00	Germany
Seymour ¹⁹	GEKW	—	—	300, 450, 600	PG	X	—	—	Great Britain
S. Fabian ¹⁹	GFWJ	—	—	—	PG	X	0.40	—	Great Britain
S. Fagan ¹⁹	GLEN	—	—	—	PG	X	—	—	Great Britain
S. Felix ¹⁹	GFIZ	—	—	—	PG	X	—	—	Great Britain
Stendoni ¹⁹	SVF	—	—	—	O	—	—	—	Greece
S. Fernando ¹⁹	MUX	260	Société Navale de l'Ouest, Paris	300, 600	PG	X	0.40	—	Great Britain
S. Firmin ¹	FOD	250	International Packing Co.	300, 450	PG	X	0.40	—	France
S. Flavia ^{9 131}	KRUI	300	—	300, 600	PG	X	0.40	—	United States of America
S. Fiorentino ¹⁹	MUO	250	United States Steel Products Co., 30, Church St., New York (N.Y.)	300, 450, 600	PG	X	0.40	—	Great Britain
S. Francisco KRT	KRT	300	Navy	—	PG	X	0.40	—	United States of America
S. Francisco NTQ ¹⁰	NTQ	—	—	300, 600	PG	N	—	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. France		Country.
							Per Word.	Minimum per Radio-telegram.	
Shawnee ¹²⁵	NIZI	—	—	300, 600	P G	N	—	—	United States of America
Sheaf Arrow ⁵⁰	GDWF	100	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Sheaf Dart ¹⁰	MLN	160	—	300, 600	P G	X	0.40	—	Great Britain
Sheaf Don ¹⁰	ZOL	145	—	300, 600	P G	X	0.15 ⁸⁸	1.50 ⁸⁸	Great Britain
Sheaf Garth ⁵⁰	GCKQ	100	—	300, 450, 600	P G	X	0.40	—	Great Britain
Sheaf Lance ¹⁰	XVT	150	—	300, 600	P G	X	0.40	—	Great Britain
Sheaf Mead ¹⁰	YEP	145	—	300, 600	P G	X	0.40	—	Great Britain
Sheaf Mount ¹⁰	GBPW	120	—	300, 600	P G	X	0.40	—	Great Britain
Sheaf Spear ¹⁰	VXKH	200	—	300, 600	P G	X	0.40	—	Great Britain
Sheba ¹⁰	VDZ	200	Canadian Govt. Merchant Marine, Montreal, P.Q.	300, 600, 800	P	X ⁸⁷	—	—	Canada
Shedrecht ¹	PYD	150	Stoomvaart Maatschappij De Maas, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Sherness ¹⁰	GFMJ	—	—	300, 450, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Sheila ¹⁰	GFRN	—	—	300, 600	P G	X	0.10 ⁸⁸	1.00 ⁸⁸	Great Britain
Shelley ¹⁰	GFNL	—	—	300, 600	P G	X	0.40	—	Great Britain
Shenandoah ¹⁰⁸	KIBD	300	Texas Co., Port Arthur (Texas)	300, 600	P G	X	0.40	—	United States of America
Shenango ¹⁰⁸	KTC	200	Gulf Refining Co., West 7th St., Port Arthur (Texas)	300, 600	P G	X	0.40	—	United States of America
Sherard Osborn ⁷¹	MFK	140	Eastern Telegraph Co., Ltd.	300, 450, 600	P	X	0.40	—	Great Britain
Sherborne	GFID	—	Navy	600	P G	—	—	—	Great Britain
Sheridan WXJ ²	WXJ	300	U.S. Army Transport, War Department, Washington (D.C.)	600	P G	N	—	—	United States of America
Sheridan XHU ¹⁰	XHU	150	—	300, 600	P G	X	0.40	—	Great Britain
Sherman KMQ ¹⁰⁸	KMQ	250	Sherman S.S. Co., 120, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Sherman WXX ²	WXX	300	U.S. Army Transport, War Department, Washington (D.C.)	600	P G	N	—	—	United States of America
Shicksbiny ¹⁰⁸	KIZP	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Shidzuoka Maru ¹	JSZ	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	N	0.40	—	Japan
Shikano Maru ¹	JHE	200	Murao Zosenjo	300, 600	P ³⁸	N	0.40	—	Japan
Shikari	GECV	—	Navy	—	P G	—	—	—	Great Britain
Shikishima ¹	JCA	150	Transports Maritimes de l'Etat	—	O	—	—	—	Japan
Shimpo Maru ¹	HOO	350	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	X	0.40	—	France
Shiunio Maru ¹	ISN	—	—	300, 600	P G	N	0.40	—	Japan

Ship	Port	Class	Age	Company	Capacity	Speed	Range	Notes
Shindo Maru ¹	..	JDD	400	Kishimoto Kisen Kaisha	300, 600	PG	1400 to 1700	Japan
Shingo Maru ¹	..	JSV	400	Kishimoto Kisen Kaisha	300, 600	PG	1400 to 1700	Japan
Shinkoku Maru ¹	..	JCV	500	Kishimoto Kisen Kaisha	300, 600, 1,800	PG	1400 to 1700	Japan
Shimpo Maru ¹	..	JDH	400	Kishimoto Kisen Kaisha	300, 600	PG	1400 to 1700	Japan
Shinsei Maru ¹	..	JEF	200	Kishimoto Kisen Kaisha	300, 600	PG	1400 to 1700	Japan
Shinyo Maru JPY ¹	..	JPY	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600, 1,800	PG	1400 to 1700	Japan
Shinyo Maru JSH ¹	..	JSH	450	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	PG	1400 to 1700	Japan
Shiragi Maru ¹	..	TSK	350	Tetsudoshu (Ministry of Railways)	300, 600, 1,800	PG	1400 to 1700	Japan
Shiraki ¹⁹	..	NUJV	—	Navy	300, 600	PG	1400 to 1700	Japan
Shokaku ¹	..	JUS	—	Navy	300, 600	PG	1400 to 1700	Japan
Shongai ¹⁹	..	ZMI	—	Navy	300, 600	PG	1400 to 1700	Japan
Shooters Island ^{9 121}	..	KERG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	1400 to 1700	United States of America
Shortsville ^{9 121}	..	KIKK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	1400 to 1700	United States of America
Shouragallus ¹	..	FWF	250	Société Maritime et Commerciale du Pacifique, 20, Rue la Boétie, Paris	300, 600	PG	1400 to 1700	France
Shreveport ^{9 121}	..	WGAO	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	1400 to 1700	United States of America
Shrewsbury Shropshire ¹⁹	..	GFIJ GSF	— 330	Navy	300, 450, 600	PG PG	1400 to 1700	United States of America
Shuja ¹²	..	VUS	200	Bombay & Persian S.N. Co., Ltd.	300, 600	PG	1400 to 1700	India
Shunko Maru ¹	..	JSQ	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	1400 to 1700	Japan
Shushitar ¹²	..	VWBS	150	Persian Gulf Steam Nav. Co. Ltd.	300, 450, 600	PG	1400 to 1700	India
Sialia ²	..	WFY	300	Henry Ford, Detroit (Mich.)	300, 450, 600	PG	1400 to 1700	United States of America
Siam ⁴⁰	..	OZM	200	Altifelskabet Det Ostasiatiske Kompagni, Copenhagen	300, 450, 600	PG	1400 to 1700	Denmark
Siam City ¹⁹	..	GBWR	—	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	1400 to 1700	Great Britain
Siamese Prince ¹⁹	..	YYN	—	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	PG	1400 to 1700	Great Britain
Sianing Maru ¹	..	JYX	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600, 1,800	PG	1400 to 1700	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs		Country.
							Per Word.	Minimum per Radiotelegram.	
Siantar ¹ ..	OLM	200	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 450	P G ..	X	0.40	4.00	Holland
Siberg ¹ ..	PMB	200	Koninklijke Paketvaart Maatschappij, Amsterdam	600, 800 300, 600	P G ..	— ⁴⁴	0.40	4.00	Dutch East Indies
Siberia Maru ¹ ..	JBR	500	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600, 1,800	P G ..	N	0.40	—	Japan
Siberian Prince ¹⁹ ..	ZTH	180	—	300, 600	P G ..	N	0.40	—	Great Britain
Sibirskov ¹⁹ ..	RBN	100	—	300, 600	O ..	X	0.40	—	Russia
Siboga ¹⁹ ..	PLZ	60	—	300, 600	O ³⁹ ..	X	—	—	Dutch East Indies
Siboney ¹⁹ ..	WRN	300	New York & Cuba Mail S.S. Co., Pier 13, East River, New York (N.Y.)	300, 600	P G ..	N	0.40	—	United States of America
Sicania IEZ ¹⁷ ..	IEZ	170	Transoceanica Società di Navigazione, Naples	300, 600	P G ..	X	0.40	—	Italy
Sicania UTN ¹⁷ ..	UTN	140	La Sicania Società Anonima di Navigazione, Trapani	300, 600	P G ..	X	0.40	—	Italy
Sicard ¹⁹ ..	NUPL	—	—	300, 600	P G ..	N	—	—	United States of America
Sicilia GBVL ¹⁹ ..	GBVL	225	—	300, 600	P G ..	X	0.40	—	Great Britain
Sicilia IHL ¹⁹ ..	IHL	190	Navy. Società Italiana di Servizi Marittime, Rome	300, 600	P G ..	X	0.40	—	Italy
Sicilia INL ¹⁷ ..	INL	100-150	Viktor Ek, Helsingfors ..	300, 600	P G ..	X	0.15	0.75	Finland
Sicilia OJR ..	OJR	170	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00	Great Britain
Sicilian ¹⁹ ..	MUN	100-150	—	300, 600	P G ..	N	0.40	—	Belgium
Sicilia ¹⁹ ..	ONS	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Sicily ¹⁹ ..	ESO	175	—	300, 600	P G ..	X	0.40	—	Great Britain
Siddons ¹⁹ ..	ZHY	160	—	300, 600	P G ..	X	0.40	—	Great Britain
Sidi-Abdallah ¹⁹ ..	FVH	350	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.10	—	France
Sidi-Abdallah ¹⁹ ..	FVB	350	Société Générale des Transports Maritimes à Vapeur, Marseilles	300, 600	P G ..	X	0.10	—	France
Sidon ¹ ..	FIO	400	Compagnie des Messageries Maritimes, Paris	300, 600	P G ..	— ³⁷	0.40	—	France
Sierentz ¹ ..	FYJ	150	L. Dreyfus & Cie, Paris	300, 600	P G ..	X	0.40	—	France
Sierra ² ..	KRW	200	E. K. Wood Lumber Co., 112, Market Street, San Francisco (Cal.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Sierra Belgrano ¹⁰ ..	OTZ	150-200	Lloyd Royal Belge ..	300, 600	P G ..	X	0.40	4.00	Belgium
Sierra Blanca ¹⁰ ..	OSB	150-200	S. A. Transocéanique de Transports, Antwerp	300, 600	P G ..	X	0.40	4.00	Belgium

	OSG	150-200	Société de Cabotage International, Antwerp	300, 600	P G	..	Δ	0.40	4.00	Belgium
Sierra Grande ¹⁰	..	150-200	Société de Cabotage International, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sierra Leone ¹⁰	..	150-200	Société de Cabotage International, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sierra Morena ¹⁰	..	150-200	Société de Cabotage International, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sierra Negra ¹⁰	..	150-200	Société de Cabotage International, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sierra Quemada ¹⁰	..	100-150	Société Transocéanique de Transports, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sierra Roja ¹⁰	..	150-200	S. A. Transocéanique de Transports, Antwerp	300, 600	P G	..	X	0.40	4.00	Belgium
Sifnos ¹	..	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	P G	..	X	0.40	4.00	Greece
Siglo (El) ⁸	..	200	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Signe ¹	..	250	Rederiaktiebolaget Bylgia, Stockholm	300, 600	P	..	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40	4.00	Sweden
Sigourney ¹⁰	..	—	Navy	300, 600	P G	..	—	0.20 ¹¹¹ 0.40 ¹¹² 0.15 ⁴⁸	—	United States of America
Sigulda ¹	..	120	Brali Seebergi, Riga	300, 450, 600, 800	P G	..	X	—	—	Lettonia
Sigurd ¹	..	—	Navy	—	O ⁸⁰	..	—	—	—	Sweden
Sigvar ¹	..	150	Rederiaktiebolaget Ingvar, Malmö	300, 600	P	..	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40	4.00	Sweden
Sigyn ¹	..	250	Stockholm Rederiaktiebolaget Svea, Stockholm	300, 600	P	..	X	0.40	4.00	Sweden
Sikh GENQ	..	—	Navy	—	P G	..	—	—	—	Great Britain Great Britain
Sikh YKZ ¹⁰	..	170	—	300, 600	P G	..	X	0.40	—	France
Si Kiang ¹	..	200	Compagnie des Messageries Maritimes, Paris	300, 600	P G	..	X	0.40	—	Great Britain Norway
Silarus ¹⁰	..	—	Navy	300, 600	P G	..	—	—	—	Italy
Sild	..	—	—	—	O	..	X	0.40	—	France
Sile ¹⁰	..	190	Navigazione Generale Italiana, Genoa	300, 600	P G	..	X	0.40	—	United States of America
Silesia ¹	..	150	Transports Maritimes de l'Elat	300, 600	P G	..	X	0.40	—	United States of America
Siletz ¹⁰	..	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	X	0.40	—	United States of America
Siljan ¹	..	250	Gothenburg - Australia Line, Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time).	0.40	4.00	Sweden
Silkeborg ¹⁰	..	200	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450 600, 800	P G	..	X	0.40	4.00	Denmark

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radiotelegram.	
Siltsworth ⁸⁰	GDKR	350	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silvanus ¹	OMB	200	Nederlandsche - Indische Tank- Stoomboot Maatschappij, The Hague	300, 600	P G ..	X	0.40	4.00	Holland
Silverado ¹⁰³	WRC	150	U.S. Shipping Board, Washington (D.C.)	300, 476, 600	P G ..	X	0.40	—	United States of America
Silverash ¹	XYM	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silverbirch ¹⁹	GJMW	—	—	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silverbrook ¹¹¹	KIBC	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Silverlight ⁷¹	GDWS	100	Siemens Bros. & Co., Ltd., Wool- wich, London, S.E. 18	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silversand ¹⁹	EKA	140	Silvershell S.S. Co., 343, Sansome St., San Francisco (Cal.)	300, 600	P G ..	X	0.40	—	Great Britain
Silver Shell ¹	WIA	300	—	300, 450, 600	P G ..	X	0.40	—	United States of America
Silverway ¹⁹	GFIL	—	Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silvia ⁷¹	GCKZ	250	Lloyd Adriatico Società di Navi- gazione, Venice	300, 450, 600	P G ..	X	0.40	—	Great Britain
Silvio Pellico ¹⁷	IMI	190	Stoomvaart Maatschappij Neder- land, Amsterdam	300, 600	P G ..	X	0.40	—	Italy
Sinaloe ¹	TWD	200	(Armateurs) Den Norske Afrika-og Australielinje (Wilh. Wilhelm- son), Tonsberg	300, 450, 600	P G ..	X	0.40	—	Holland
Simla ²³	LEW	150-200	Société les Pêcheries de Fécamp, Fécamp	300, 600	P G ..	X	0.40	4.00	Norway
Simon Duhamel ¹	FED	300	Navy	—	P G ..	X	0.40	—	France
Simoun ¹	GENR	—	Navy	300, 800	P G ..	—	—	—	Great Britain
Simoun ¹	FASJ	—	Navy	—	P G ..	N	0.05	—	France
Simpson ¹⁰³	NUPX	—	Operated by Cuyzer Irvine & Co., Ltd., 2, St. Mary Axe, London, E.C. 3	300, 600	P G ..	N	—	—	United States of America
Sinaloa GBSJ ⁷¹	GBSJ	—	(Armateur) A. O. Lindvig, Chris- tiania	300, 600	P G ..	X	0.40	—	Great Britain
Sinaloa ¹	LJIB	300	United States Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.20	2.00	Norway
Sinasta ¹	KDAC	300	Navy	300, 600	P G ..	X	0.40	—	United States of America
Sinclair ⁸⁸	NULR	—	—	300, 600	P G ..	N	0.40 ¹¹¹ 0.40 ¹¹²	—	United States of America

Sindoro ¹	PFE	200	Stoomvaart-Maatschappij, Rotterdam damsche Lloyd, Rotterdam	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	0.40	Holland
Sines ⁶¹ S. Inez ^{9 131}	CSW WSI	100-150 300	Thomas Crowley	300, 600 300, 450, 600	P G P G	N X	0.40 0.40	4.00	Portugal United States of America
Singapore ¹⁹ Singapore Maru ¹	VYA JSP	175 500	Kokusai Kisen Kaisha .. .	300, 600 300, 600	P G P G	X	0.40 0.40	—	Great Britain Japan
Singee ¹ Singkep ¹	UKK TWJ	180 200	René Petit, Dieppe Stoomvaart Maatschappij Nederland, Amsterdam	300, 600 300, 450, 600, 800	P G P G	X X	0.40 0.40	4.00	France Holland
Singleton Abbey ¹¹	GDLX	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P G	X	0.40	—	Great Britain
Singur ²	VWCS	300	Burma Oil Company, Ltd. (Agents, Finley, Fleming & Co., Rangoon)	300, 450, 600, 800	P G	X	0.40	—	India
Sinsinawa ^{9 131}	KOJD	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Sioux ¹ Sioux City ¹⁷	FBSI KUGK	— 200	Navy Shipping Board, Washington (D.C.)	300, 800 300, 450, 600	P G P G	N X	0.05 0.40	—	France United States of America
Sioux Falls ^{9 131}	KONN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40 ¹¹⁶	—	United States of America
Siptah ¹⁹ Siracusa ¹	OFX DYJ	170 250	—	300, 600 300, 600	P G P G	X X	0.40 0.40	4.00	Great Britain Germany
Sirdar Sirena ¹⁷	GENS UTF	— 140	Navy Navigazione Libera Triestina, Trieste	300, 600	P G P G	— X	— 0.40	—	Great Britain Italy
Sir Ernest Cassel ¹	SFP	150	Trafikaktiebolaget Grängesberg Oxelösund, Stockholm	300, 600	P	—	0.40	4.00	Sweden
Sir Frederick Dumayne ¹⁹ Sir Harvey Adamson ¹⁹ Sirio IBBB	GJFY MUK IBBB	— 170 —	Navy	300, 450, 600 300, 600	P G P G	X X X	0.40 0.40	—	Great Britain Great Britain Italy
Sirio SRW ¹⁶ Sirio UTI ¹⁷	SRW UTI	190 190	Lloyd Brasileiro, Rio de Janeiro Societa Navigazione Ligure di Armamento, Genoa	300, 600 300, 600	P G P G	N X	0.40 0.40	—	Brazil Italy
Siris ¹⁹ Sirius LWS ¹	GBRD LWS	— 200-250	(Armateurs) Det Bergenske Dampskibsselskab, Trondhjem	300, 600 300, 450, 600	P G P G	N X	0.40 0.40	4.00	Great Britain Norway
Sirius NUPP ¹⁰⁴ Sirius OHS ⁴⁰	NUPP OHS	— 150	Aktheselskabet Dampskibsselskabet Orion, Copenhagen	300, 450, 600 300, 800	P G P G	N X	— 0.40	—	United States of America Denmark
Sir James Bell ¹⁹ Sirocco	GFVS FBQS	— —	Navy	300, 450, 600	P G P G	X N	0.40 0.05	—	Great Britain France
Sirrah LWR ¹	LWR	400	(Armateur) H. A. Christensen, Sandefjord	300, 450, 600	P G	X	0.40	4.00	Norway
Sirrah PXJ ¹	PXJ	200	Van Nievelt Goudriaan en Co.'s Stoomvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G	X	0.40	4.00	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Sirsa ¹⁸	..	..	..	..	..	..	..	..	Great Britain
Sirte ¹⁷	..	140	Rodin G. B., Leghorn ..	300, 800	PG	X	0.40	—	Italy
Sir Thomas Shaughnessy ^{9 11}	WVF	200	Jenkins S.S. Co., Cleveland (Ohio)	300, 600 300, 450, 600	PG	X	0.40	—	United States of America
Sirtori	..	..	Navy	..	..	..	..	..	Italy
S. Isabel ^{9 11}	KDBV	150	American & Cuban S.S. Line, 39, Cortland St., New York (N.Y.)	300, 450, 600	PG	X	0.40	—	United States of America
Sisiyou ²	KDAS	200	E. K. Wood Lumber Co., 112, Market St., San Francisco (Cal.)	300, 600	PG	X	0.40	—	United States of America
S. Issey	GLEP	..	Navy	..	..	..	..	..	Great Britain
Sisto ¹⁰	LWC	100-150	(Armateur) B. Stolt, Neilson, Haugesund	300, 600	PG	X	0.40	4.00	Norway
Sithonia ¹⁹	YUO	..	..	300, 600	PG	X	0.40	—	Great Britain
Sitoebondo ¹	PHT	150	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 600 300, 450 600, 800	PG	X	0.40	4.00	Holland
Sitra ¹⁹	EOJ	..	..	300, 600	PG	X	0.40	—	Great Britain
Sitting ¹⁹	GRT	..	..	300, 600	PG	X	0.40	—	Great Britain
Sixaola ²⁷	KDS	300	United Fruit S.S. Corporation ..	300, 600, 1,800	PG	N	0.40	—	United States of America
Six-Fours	FANL	..	Navy	600, 800	PG	N	0.40	—	France
Sixtyfour	AVH	150, 175	(Armateur) L. Severin Skougard, Christiania	300, 600	PG	X	0.05	4.00	Norway
S. Jacinto ¹⁰³	KES	300	Mallory S.S. Co., Pier 36, North River, New York (N.Y.)	300, 450, 600	PG	N	0.40	—	United States of America
S. Jacob ^{1..}	PMJ	250	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	PG	..	0.40	4.00	Dutch East Indies
S. Jansland ¹	OMD	150	Scheepvaart en Steenkolen Maatschappij, Rotterdam	300, 600	PG	X	0.40	4.00	Holland
S. Jean FGJ ¹	FGJ	150	Compagnie Générale Transatlantique, Paris	300, 600	PG	N	0.40	—	France
S. Jean FHD ¹	FHD	180	A. Coppin et Cie, Boulogne-sur-Mer	300, 600	PG	X	0.40	—	France
S. Jehanne ¹	FZS	200	Société des Chèvres de Mer, Paris	300, 600	PG	X	0.40	4.00	France
S. Jeronimo ¹⁹	MJP	180	..	300, 600	PG	X	0.40	—	Great Britain
S. Joachim ¹	UJI	150	Transports Maritimes de l'Etat	300, 600	PG	X	0.40	—	France
S. Johns County ^{9 123}	KIKG	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	—	United States of America
Sjemand ^{1..}	TPO	200	(Armateur) T. Dannevig & Co., Christiania	300, 600	PG	X	0.40	4.00	Norway
S. Jorge	CUS	100-150	Hijos de Jose Tava, Barcelona	300, 600	PG	N	0.40	4.00	Portugal
S. José TKO ¹	TKO	150	(Armateurs) A/S Bonheur Fred Olsen & Co., Christiania	300, 600	PG	N	0.30	3.00	Spain
S. José TRB ¹	TRB	100-150	..	300, 600	PG	X	0.40	4.00	Norway

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiogram.	
Skogland ¹	AVA	300	(Armateurs) T. H. Skogland & Son, A/s. Haugesund	300, 600	P G	X	0.40	4.00	Norway
Skolma ¹	ARR	4	(Armateurs) A/s. Grom K. Th. Eimersen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Skrei	IAM	300	(Armateur) B.A. Saane, Christiania	300, 600	O P G	X	—	—	Norway
Skryner ¹	ASE	—	Navy	—	O ⁸⁹	—	0.40	4.00	Norway
Skuld	SBU	200	Vidor & Cie, Boulogne-sur-Mer	300, 600	P G	X	—	—	Sweden
Slack ¹	FHK	200	Stoomvaart Maatschappij, Rotterdam	300, 450	P G	0650 to 0800	0.40	—	France
Slamat ¹	OLQ	200	—	600, 800	P G	0900 to 1200	0.40	4.00	Holland
						1400 to 1800			
						2000 to 2200			
S. Lamberto ¹⁹	GFKC	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E.18	300, 450, 600	P G	X	0.40	—	Great Britain
Slav ²¹	YHY	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Slavic Prince ¹⁹	XIV	150	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Slavonia ¹	UDK	200	—	300, 600	P G	X	0.40	—	France
S. Léger ¹	UAY	150	René Petit, 27 Quai de l'Arrière, Port Dieppe	300, 600	P G	X	0.40	—	France
S. Leon ¹⁹	GOZK	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
S. Leonardo ¹⁹	GFKP	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
S. Leopoldo ¹⁹	GFKN	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Sieve Bawn ²¹	YWC	135	London & North Western Rly. Co.	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Sieve Donard ²¹	GFXV	—	—	300, 450, 600	P G	N	0.10 ⁸⁸	1.00 ⁸⁸	Great Britain
Sieve Gallon ²¹	YWE	135	London & North Western Rly. Co.	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Sievenore ²¹	YWF	135	London & North Western Rly. Co.	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Slocum ²	WXS	—	Government, Washington (D.C.)	300, 600	P G	—	—	—	United States of America
Sloet van de Beele ¹	PMS	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	4.00	Dutch East Indies
S. Lorenzo KEZ ¹⁰³	KEZ	300	New York & Porto Rico S.S. Co., 11, Broadway, New York (N.Y.)	300, 600	P G	N	0.40	—	United States of America
S. Lorenzo MND ¹⁹	MND	180	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Rotterdam	300, 600	P G	X	0.40	—	Great Britain
Sloterdijk ¹	TVE	200	—	300, 450	P G	X	0.40	—	Holland
				600, 800	P G	X	0.40	4.00	

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum Radiogram.	
S. Michael ¹⁹	VIZ	150	—	300, 600	P G	X	0.40	—	Great Britain
S. Michel ¹⁷	ROM	200	Société Navale de l'Ouest, Paris.	300, 600	P G	X	0.40	—	France
S. Miguel	UQP	140	Lloyd Adriatico Società di Navigazione, Venice	300, 600	P G	X	0.40	—	Italy
S. Miguel CSS ²¹	CSS	100-150	(Armateurs) D/S A/S Otto	300, 600	P G	N	0.40	4.00	Portugal
S. Miguel TRA ¹	TRA	100-150	Thoresens Linie, Christiania	300, 600	P G	N	0.40	4.00	Norway
Smith ¹⁰²	NIXG	—	Navy	300, 600	P G	N	—	—	United States of America
Smith Thompson ²²	NUJJ	—	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Smolensk ¹⁹	ODS	125	—	300, 600	P G	X	0.40 ¹¹²	—	United States of America
S. Monance ¹	YKJ	—	Pan-American Petroleum & Transport Co., Inc., 1015, Security Building, Los Angeles (Cal.)	300, 600	P G	X	0.15 ⁸²	1.90 ⁸²	Great Britain
S. M. Spalding ^{9 111}	WKG	300	Sociedad A. Egara, Barcelona	300, 450, 600	P G	X	—	—	Great Britain
S. Mus ¹	TMD	100	Aktieselskabet KobenhavnsBunkerul Depot, Copenhagen	300, 450, 600, 800	P G	X	0.40	—	United States of America
Smut ¹⁰	OXS	200	Rederiaktiebolaget Sverige-Levanten, Gothenburg	300, 600	P	X	—	—	United States of America
Smyrna ¹	SKR	250	—	—	—	—	—	—	Spain
Smyrne	SYD	—	Navy	—	O	—	—	—	Denmark
Suares ¹⁹	EZL	—	Navy	300, 600	P G	—	—	—	Sweden
Suapdragon	GFL	150-200	(Armateurs) S. O. Stray & Co., Ltd., A/S Christiansands	300, 600	P G	N	—	1.00 ⁸⁷	Greece
S. Nazaire ¹	LDT	150	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	X	0.40	4.00	Great Britain
S. Nazario ¹⁹	FRZ	200	(Armateur) Harald Crieg Martens, Bergen	300, 600	P G	N	—	—	Norway
S. Nefeld ¹	MUH	200	Columbia River Packers Assn., Astoria (Oregon)	300, 600	P G	X	0.40	4.00	France
S. Nicholas ²	TSSQ	300	Navy	300, 600	P G	X	—	—	Great Britain
S. Nicolas ¹⁹	WSS	300	U.S. Coast Guard Treasury Dept., Washington (D.C.)	300, 600	P G	X	0.20	—	Norway
S. Ninian ⁴⁰	FOAT	—	—	600, 800	P G	X	—	—	United States of America
S. Ninian ⁴⁰	GBTP	100	—	300, 600	P G	N	0.05	—	France
S. Noobornish ²	NRF	200	—	300, 600	P G	X	0.10 ⁸⁷	—	Great Britain
Snowdon ⁷¹	YWG	135	London & North Western Railway Company	300, 600	P G	N	0.20 ¹¹²	—	United States of America
							0.40 ¹¹²	1.00 ⁸⁷	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Solen ¹⁹	..	—	—	300, 450, 600	PG ..	X	0.40	—	Great Britain
Solferino IJS	..	—	Navy	—	—	—	—	—	Italy
Solferino LDP ¹	..	75-100	(Armateur) Otto Thorsen, Christiania	300, 600	PG ..	X	0.40	4.00	Norway
Solhaug	250-275	(Armateur) A/S Mercator, Lars Maeland & H. Karluf Hansen, Haugesund. (The Accounts are settled by the Owners)	300, 600, 800	PG ..	X	0.40	4.00	Norway
Solitaire ¹⁰³	..	150	Texas S.S. Co., 17, Battery Place, New York (N.Y.)	300, 600	PG ..	X	0.40	—	United States of America
S. Olivia ^{9 121}	..	300	Atlantic & Pacific S.S. Co., 7, Hanover Sq., New York (N.Y.)	300, 450, 600	PG ..	X	0.40	—	United States of America
Sollum ⁴⁷	..	200	—	600	—	—	—	—	Egypt
Soløven ¹	..	—	Navy	600	O ³ ..	X	—	—	Denmark
Solstref ²³	..	150-200	(Armateur) Chr. Nielsen & Co., Larvik	300, 600	PG ..	X	0.40	4.00	Norway
Solunto ¹⁷	..	140	Stella Società di Navigazione, Rome	300, 600	PG ..	X	0.40	—	Italy
Solvaer ¹	..	200	(Armateur) Muller & Johnsen, Bergen	300, 450, 600	PG ..	X	0.40	4.00	Norway
Solvang	200	(Armateur) D/S A/S John Knudsen, Haugesund. (The Accounts are settled by the Owners)	300, 600	PG ..	X	0.40	4.00	Norway
Solveig Skogland ¹	..	150-200	(Armateur) T. H. Skogland & Son, A/S Haugesund	300, 600	PG ..	X	0.40	4.00	Norway
Somali FBOM	..	—	Navy	300, 800	PG ..	N	0.05	—	France
Somali MIW ¹⁹	..	230	—	300, 600	PG ..	X	0.40	—	Great Britain
Somedono Maru ¹	..	400	Tatsuuma Kisen Kabushiki Kaisha	300, 600, 1,800	PG ..	0800 to 1700 1400 to 1700 2000 to 2400	0.40	—	Japan
Somers ²⁰	..	—	Navy	300, 600	PG ..	X	0.20 ¹¹³ 0.40 ¹¹²	—	United States of America
Somersby ¹⁹	..	150	—	300, 600	PG ..	X	0.40	—	Great Britain
Somerset EPL ¹⁹	..	150	—	300, 600	PG ..	X	0.40	—	Great Britain
Somerset KSU ^{9 121}	..	300	Standard Oil Co. of New York, Inc., 26, Broadway, New York (N.Y.)	300, 450, 600	PG ..	X	0.40	—	United States of America

Ship	Code	Capacity	Company	Port	Class	Speed	Range	Notes
Somersethire ⁸⁹	GDZP	100	—	—	PG	300, 600	4.40	Great Britain
Somerton ¹⁰	GNP	—	—	—	PG	300, 800	0.40	France
Somme FBSO	FBSO	250	Navy, Achter, Duhamel & Courmay, Fécamp	—	PG	300, 800	0.05	France
Somme FHT ¹	FHT	200	Compagnie Générale Transatlantique, Paris	—	PG	300, 600	0.40	France
Somme FQS ¹	FQS	200	Compagnie Générale Transatlantique, Paris	—	PG	300, 600	0.40	France
Somme GBQV ¹⁹	GBQV	—	Navy	—	PG	300, 600	0.40	Great Britain
Somme GENW	GENW	150	Nederlandsche - Amerikaansche Stoomboot Maatschappij, Holland-Amerika Lijn, Rotterdam	—	PG	300, 450	0.40	Holland
Sommelsdijk ¹	PEW	—	Navy	—	PG	600, 800	0.40	Holland
Sommersgibile Italiano	IAAB	—	Operated by Earl of Dunraven, Kenry House, Putney Vale, London, S.W. 15	—	P	300, 600	—	Italy
Sona ²¹	GJCP	—	Navy	—	PG	300, 800	—	Great Britain
Sonde	FABQ	—	Artikelskabet Dampskibsselskabet	—	PG	300, 450	0.05	Denmark
Sonderborg ¹	OIV	300	Dannebrog, Copenhagen	—	PG	600, 800	0.40	Denmark
Sonderburg ¹	AMG	—	Navy	—	O	300, 600	—	Germany
Soneck ³⁸	DSO	200	(Armateur) Lorentz W. Hansen, Bergen	—	PG	300, 600	0.40	Germany
Songa ¹	TPS	200-250	(Armateur) Lorentz W. Hansen, Bergen	—	PG	300, 600	0.40	Norway
Songdal ¹	LGA	200-250	(Armateur) S. O. Stray & Co., Ltd., A/S Christiansand, S.	—	PG	300, 600	0.40	Norway
Songely ¹	ATP	100-150	(Armateur) S. O. Stray & Co., Ltd., A/S Christiansand, S.	—	PG	300, 600	0.40	Norway
Songster ¹⁹	GXF	—	(Armateur) S. O. Stray & Co., Ltd., A/S Christiansand, S.	—	PG	300, 600	0.40	Great Britain
Songvaar ¹	LGC	200-250	(Armateur) S. O. Stray & Co., Ltd., A/S Christiansand, S.	—	PG	300, 600	0.40	Norway
Songvand ¹	LGB	200-250	(Armateur) S. O. Stray & Co., Ltd., A/S Christiansand, S.	—	PG	300, 600	0.40	Norway
Sonja ¹	SIZ	250	Rederiaktiebolaget Transatlantic, Gothenburg	—	P	300, 600	0.40	Sweden
Sonnenburg ³⁵	DDD	200	—	—	PG	300, 600	0.40	Germany
Sonnenfels ONEA ¹⁰	NEA	150-200	Association Maritime, Belge, Antwerp	—	PG	300, 600	0.40	Belgium
Sonoma NTG ⁸⁹	—	—	Navy	—	PG	300, 600	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Sonoma WHM ¹⁰¹	WH	300	Oceanic S.S. Co., 60, California Street, San Francisco (Cal.)	—	PG	300, 600, 1,800	0.40	United States of America
Sonora ¹	UIS	700	Compagnie Générale Transatlantique, 6 Rue Aubert, Paris	—	PG	300, 600	0.40	France
Sophie Rickmers ³⁵	DSR	200	—	—	PG	300, 600	0.40	Germany
Sophocles ¹	GRWX	—	—	—	PG	300, 450; 600, 2,100, 2,200, 2,400	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Sorceress ..	GENX	—	Navy	—	P G	—	—	—	Great Britain
Sori ¹⁷ ..	IIN	140	Navigazione Alta Italia, Turin	300, 600	P G	X	0.40	—	Italy
Sorrideren ¹ ..	OVR	—	Navy	600	O ⁸	X	—	—	Denmark
Sörland ¹ ..	TPP	150-175	(Armateurs) S. O. Stray & Co., A/S Christiansand, S.	300, 600	P G	X	0.40	4.00	Norway
Sorrento ¹⁹ ..	EXJ	115	Aktieselskabet Dampskibsselskabet Atlantenhavet, Copenhagen	300, 600	P G	X	0.40	—	Great Britain
Sortheavet ⁴⁰ ..	—	—	Societe Russe de Telegraphie et Telephonie sans fils	—	—	—	—	—	Denmark
Sosnovetz ..	RBU	100	Navy	300, 600	O	X	0.40	—	Russia
Sotero ¹⁹ ..	ODC	145	—	300, 600	P G	X	0.40	—	Great Britain
Sotomomo ¹⁹ ..	NECZ	200	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
Soudan ¹⁹ ..	MNB	200	—	300, 600	P G	N	0.40 ¹¹²	—	Great Britain
Sourah ¹ ..	FPW	200	Compagnie de Navigation Paquet, Marseilles	300, 600	P G	N	0.40	—	France
Söulven ¹ ..	OVU	—	Navy	600	O ⁸	X	—	—	Denmark
Sous ¹ ..	FPM	—	Compagnie de Navigation Paquet, Marseilles	—	P G	—	0.40	—	France
Sousmarin F.1 ..	SOW	25	Navy	150	O ¹⁶	—	0.40	—	Brazil
Sousmarin F.3 ..	SOX	25	Navy	150	O ¹⁶	—	0.40	—	Brazil
Sousmarin F.5 ..	SOZ	25	Navy	150	O ¹⁶	—	0.40	—	Brazil
South American WEO ¹ ¹¹¹ ..	WEO	150	Chicago, Duluth & Georgian Bay S.S. Co., Chicago (Ill.)	300, 600	P G	N	0.20	—	United States of America
South American VGYJ ²⁰ ..	VGYJ	1000	American Metal Transportation Co., 61, Broadway, New York (N.Y.)	300, 600, 800	P	— ²⁷	0.40	—	Canada
South Bend ⁹⁷ ..	KEXQ	—	U.S. Army Transport, War Depart- ment, Washington (D.C.)	300, 600	P G	N	—	—	United States of America
South Carolina ¹⁹ ..	NSW	—	Navy	300, 600	P G	N	0.20 ¹¹¹	—	United States of America
South Dakota ¹⁰² ..	NISG	—	—	300, 600	P G	X	0.40 ¹¹²	—	United States of America
South Pole ¹⁰³ ..	WDIA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	—	—	United States of America
South Stack ⁷¹ ..	YWH	135	London & North Western Ry. Co.	300, 600	P G	N	0.10 ⁸⁷	—	Great Britain
South-Western Miller ¹⁸ ..	MTV	190	—	300, 600	P G	X	0.40	—	Great Britain
Southampton ..	GEJY	—	Navy	—	P G	N	—	—	Great Britain
Southard ⁹⁰ ..	NAJK	—	—	300, 600	P G	N	0.20 ¹¹¹	—	United States of America

Southern Coast ¹⁸	BDP	140	U.S. Shipping Board, Washington (D.C.)	300, 450 600, 1,800	P G	..	N	0.40	United States of America
Southern Cross ¹⁷	KDTZ	300	—	300, 450 600, 2,100	P G	..	X	0.40	Great Britain
Southern Isles ¹⁹	YJH	—	—	300, 450 600, 2,100	P G	..	X	0.40	Great Britain
Southern Queen ²¹	YRA	300	Operated by the Southern Whaling & Sealing Co., Ltd., A 16, Exchange Buildings, Liverpool	2,400, 5,400 300, 450, 600	P G	..	X	0.40	Great Britain
Southgate ¹⁹	ZCZ	175	—	300, 600	P G	..	X	0.40	Great Britain
Southlea ¹⁹	BCT	—	—	300, 600	P G	..	X	0.40	Great Britain
Southport ¹⁹	EKH	155	—	300, 600	P G	..	X	0.40	Great Britain
Southway ¹⁹	YGC	—	—	300, 600	P G	..	X	0.40	Great Britain
Soutier ¹ ..	HOI	150	—	300, 600	P G	..	X	0.40	France
S.P. 43 ⁹⁹ ..	NUBB	—	Transports Maritimes de l'Etat ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 54 ⁹⁹ ..	NUBK	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 164 ⁹⁹	NALQ	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 179 ⁹⁹	NUDF	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 181 ⁹⁹	NEFS	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 185 ⁹⁹	NUFZ	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 214 ⁹⁹	NUCX	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 249 ⁹⁹	NUCZ	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 265 ⁹⁹	NUCT	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 340 ⁹⁹	NUBZ	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 399 ⁹⁹	NUFG	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 493 ..	NDV	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 521 ⁹⁹	NHF	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 522 ⁹⁹	NUBT	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 573 ⁹⁹	NUCG	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 642 ⁹⁹	NUCS	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 681 ⁹⁹	NUMS	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 707 ⁹⁹	NUDR	—	Navy ..	300, 600	P G	..	N	0.20 111 0.40 112	United States of America
S.P. 724 ⁹⁹	NEKM	—	—	300, 600	P G	..	N	0.20 111 0.40 112	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
S.P. 726 ⁸⁹	NUBS	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
765 ⁸⁹	NUCK	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
S.P. 838 ⁸⁹	NUFL	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 909 ⁸⁹	NUBC	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 951 ⁸⁹	NJI	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 1015 ⁸⁹	NEKS	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
S.P. 1116 ⁸⁹	NKG	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
S.P. 1149 ⁸⁹	NUFN	—	Navy	300, 600	PG ..	N	0.40 111 0.20 112	—	United States of America
S.P. 1161 ⁸⁹	NTD	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 1232	NADQ	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 1234 ⁸⁹	NUCJ	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 2047 ⁸⁹	NAQM	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 2225 ⁸⁹	NECD	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 2373	NUDK	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 3218 ⁸⁹	NUGB	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
S.P. 3297 ⁸⁹	NUBR	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Spaarndam ¹	TVN	250	Nederlandsche Stoomboot Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450 600, 800	PG ..	N	0.40 112 0.20 111	4.00	Holland
S. Pablo ⁷¹	ZTR	500	Tropical Radio Telegraph Co., 131, State St., Boston, Mass.	300, 800	PG ..	N	0.40 112 0.40 112	—	Great Britain
Spekbruggeren ¹	OVS	—	Navy	600	O ³ ..	X	0.40	—	Denmark
Spahi	FBSP	—	Navy	500, 800	D ³ ..	N	—	—	Denmark

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radio-telegram.	
Splendid ¹⁷	GEPO	—	Navy	—	PG	—	—	—	Great Britain
Splendor	ILS	190	La Columbia, Genoa	300, 600	PG	X	0.40	—	Italy
Spokane ^{9 131}	WGE	150	Pacific S.S. Co., Portland (Maine)	300, 600	PG	N	0.40	—	United States of America
Sportive	GEFF	—	Navy	—	PG	—	—	—	Great Britain
Spray ^{9 131}	KDWJ	150	Anthony J. McAllister	300, 450, 600	PG	X	0.40	—	United States of America
Spray KDYB	KDYB	50	John F. Gray	300, 450, 600	P	X	—	—	United States of America
Spring Carroll ¹	WZU	30	Government, Washington (D.C.)	300, 600	PG	X	—	—	United States of America
Springbok	GEPJ	—	Navy	—	PG	—	—	—	Great Britain
Springburn ¹⁹	EVV	—	—	300, 600	PG	X	0.40	—	Great Britain
Springeren ¹	OWU	—	Navy	600	O ⁸	X	—	—	Denmark
Springfield ^{9 131}	KUTR	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	X	0.40	—	United States of America
Springfontein ¹	HEL	150	Nederlandsche Zuid-Afrikaansche Stoornvaart-Maatschappij, Holland and Zuid Afrika Lijn, Rotterdam	300, 600	PG	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	Holland
Sprogo ⁴²	OZU	200	Roderict Jens Petersen, Haderslev	300, 450	PG	—	0.40	4.00	Denmark
S. Prosper ¹	FOG	300	Société Navale de l'Ouest, Paris	600, 800	PG	X	0.40	—	France
Sproston ⁴⁶	NEVT	—	Navy	300, 600	PG	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Spyridon ¹	TGG	150-200	G. Livanos, Chios	300, 600	PG	X	0.40	4.00	Greece
S. Ramon ¹⁰⁰	WNW	150	Mexican Fruit and Steamship Corporation, 706, Whitney Central Buildings, New Orleans (Cal.)	300, 600	PG	X	0.40	—	United States of America
S. Raphael ^{99 1}	FAS	1	Société Française D'Armement, Frisch & Cie, Marseilles	300, 600	PG	N	0.10	—	France
S. Ricardo ¹⁹	MBR	170	Andrew F. Mahoney, 871, Clayton Street, San Francisco (Cal.)	300, 600	PG	X	0.40	—	Great Britain
S. Rita ^{9 131}	WBR	300	—	300, 450, 600	PG	X	0.40	—	United States of America
S. Roberto ¹⁹	GCJZ	—	(Armateurs) Jens Lund & Co., A/S, Orsnos (Tonsberg)	300, 450, 600	PG	X	0.40	—	Great Britain
S. Roch ¹⁰	AWQ	150-175	—	300, 600	PG	X	0.40	4.00	Norway
S. Rognevald ⁹⁹	GDS	100	Grace S.S. Co., 71, Hanover Sq., New York (N.Y.)	300, 600	PG	X	0.10 ⁸⁷ 0.40	1.00 ⁸⁷	Great Britain
S. Rosa ^{9 131}	WBO	250	—	300, 500, 600	PG	X	—	—	United States of America

S. Rosalia ¹³¹	KLO	200	U.S. Steel Products Co., 30, Churchill Street, New York (N.Y.)	300, 450, 600	P	G	N	0.40	—	Italy
S. Rossore ¹⁷	IME	190	Lloyd Sabauda Societa Anonima Per Azioni, Genoa	300, 600	P	G	N	0.30	3.00	Spain
S. Salvador ¹	TLO	200	Mendiguen Y Zaballa, Bilbao	300, 600	P	G	X	0.40	—	France
S. Servan ¹	FTQ	200	Compagnie Générale Transatlantique, Paris	300, 600	P	G	X	0.40	—	Great Britain
S. Silvestre ¹⁹	MYS	200	—	300, 600	P	G	X	0.40	—	Great Britain
S. Stephen ¹⁹	EVZ	—	—	300, 600	P	G	X	0.40	—	Great Britain
S. Suniwa ⁵⁰	GCLQ	100	—	300, 600	P	G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
S. Todor ¹⁹	GFKB	—	—	300, 450, 600	P	G	X	0.40	—	Great Britain
S. Theresa ^{BLJ}	BLI	—	—	300, 600	P	G	X	0.40	—	Great Britain
S. Theresa ^{BLJ}	GDYT	—	—	300, 600	P	G	X	0.40	—	Great Britain
S. Tiburcio ¹⁹	MAO	190	—	300, 600	P	G	X	0.40	—	Great Britain
S. Tuso ¹⁴	VBU	200	Department of the Naval Service, Ottawa, Ont.	300, 600	O		X	—	—	Canada
Stadacona ²		200	Stoomboot Maatschappij, "Stad Amsterdam, Amsterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Amsterdam ¹	PZR	200	Government	300, 600	P	G	N ¹⁸	0.40 ¹¹	0.40 ¹¹	Belgium
Stad Antwerpen ¹	OPA	100-150	Arnhemse Scheepvaart Maatschappij, Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Arnhem ¹	PII	200	Halcyon Lijn, Rotterdam	300, 450	P	G	X	0.40	4.00	Holland
Stad Delft ¹	HEU	200	Stoomboot Maatschappij "Stad Dordrecht", Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Dordrecht ¹	PZP	200	Stoomvaart Maatschappij Nederland, Amsterdam	300, 450	P	G	X	0.40	4.00	Holland
Stadsdijk ¹	TVK	200	Stoomboot Maatschappij "Stad Zalt Bonmel", Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Zaandam ¹	PIF	200	Stoomboot Maatschappij "Stad Zalt Bonmel", Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Zalt Bonmel ¹	PZQ	200	Stoomboot Maatschappij "Stad Zalt Bonmel", Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Stad Zwolle ¹	PIE	200	Stoomboot Maatschappij "Stad Zalt Bonmel", Rotterdam	300, 600	P	G	X	0.40	4.00	Holland
Staerkodder ¹	LWE	75-100	(Armateur) Norsk Bjerningskompani, Christiania	300, 600	P	G	X	—	—	Norway
Stafford	GFIM	—	Navy	—	P	G	—	—	—	Great Britain
Stapool ¹⁹	ETM	120	Standard Oil Co. of N.J. Inc., 26, Broadway, New York (N.Y.)	300, 600	P	G	X	0.40	—	Great Britain
Stakesby ⁵⁰	GBZY	250	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P	G	X	0.40	—	Australian Commonwealth
Stalwart	GABW	—	Broadway, New York (N.Y.)	—	P	G	—	—	—	United States of America
Standard KIC ¹³¹	KIC	300	Standard Oil Co. of New York Inc., 26, Broadway, New York (N.Y.)	300, 450, 600	P	G	X	0.40	—	United States of America
Standard KXOI ¹³¹	KXOI	100	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P	G	X	0.40	—	United States of America
Standard II ¹³¹	KSA	200	Standard Oil Co. of New York Inc., 26, Broadway, New York (N.Y.)	300, 600	P	G	X	0.40	—	United States of America
Standard Arrow ¹³¹	KSV	250	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P	G	N	0.40	—	United States of America
Standtug No. I ¹³¹	KOQM	100	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	G	X	0.40	—	United States of America
Stanja ¹	TUC	150-175	(Armateur) I. B. Stang, Christiania	300, 600	P	G	X	0.40	4.00	Norway
Stanley KISJ ⁹⁷	KISJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P	G	X	0.40	—	United States of America
Stanley VDE ²	VDE	100	Government Station (Department, Marine & Fisheries, Ottawa, Ont.)	300, 600, 800	O		X	—	—	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Stanley Dollar ¹⁰⁸	WHS	300	Dollar S.S. Line, 230, California St., San Francisco (Cal.)	300, 450, 600	P G	X	0.20 ¹²²	—	United States of America
Stanley Hall ¹⁹	EOR	160	—	300, 600	P G	X	0.40	—	Great Britain
Stammore ¹⁹	EVU	140	—	300, 600	P G	X	0.40	—	Great Britain
Stansbury ²⁹	NEXV	140	Navy	300, 600	P G	X	0.20 ¹¹¹	—	United States of America
Star I ²	WRIO	150	United States Whaling Co., Ketchikan (Alaska)	300, 600	P G	X	0.40 ¹¹²	—	United States of America
Starfish	GEPL	—	Navy	—	P G	—	—	—	Great Britain
Starhawk ¹⁹	TUD	150-175	(Armateur) I. B. Stang, Christiana	300, 600	P G	X	0.40	4.00	Norway
Starlight ¹⁰	GBZC	200	—	300, 600	P G	X	0.40	—	Great Britain
Star of Greenland ²	KERF	200	Alaska Packers Association, Wells Fargo Building, San Francisco (Cal.)	300, 400, 600	P G	X	0.20 ¹¹¹	—	United States of America
Star of Holland ²	KUGQ	150	Alaska Packers Association, Wells Fargo Building, San Francisco (Cal.)	300, 600	P G	X	0.40 ¹¹²	—	United States of America
Star of Lapland ²	KXOA	200	Alaska Packers Association, Wells Fargo Building, San Francisco (Cal.)	300, 400, 600	P G	X	0.20	—	United States of America
Starr ²⁷	WPS	100	San Juan Fishing & Packing Co., Pine St., Seattle (Wash.)	300, 600	P G	X	0.20 ¹¹¹	—	United States of America
State of Ohio ¹³¹	WFR	150	Cleveland & Buffalo Transit Co., Cleveland (Ohio)	300, 600	P G	X	0.40	—	United States of America
Statesman ¹⁹	EPU	170	—	300, 600	P G	X	0.20	—	United States of America
Stavangerfjord ²¹	LFS	500-1000	(Armateur) Den Norske Amerika-Linje, Christiania	300, 450, 600	P G	X	0.40	—	Great Britain
Staveley ⁷¹	EQQ	—	Great Central Railway Co.	800, 2,100 300, 500, 600	P G	N	0.40	4.00	Norway
Steadfast GEPM. ¹	GEPM	—	Navy	—	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Steadfast WDEO ¹⁰⁸	WDEO	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	—	—	—	Great Britain
S Tecla ^{9 131}	KNEE	150	Grace S.S. Co., 7, Hanover Square, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Steel Age ^{9 131}	KOXZ	300	U.S. Steel Products Co., 30 Church Street, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Steel Engineer ^{9 131}	KDCX	300	U.S. Steel Products Co., 30 Church Street, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Steel Exporter ^{9 131}	KDDN	300	U.S. Steel Products Co., 30 Church Street, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America

Steelmaker ⁹ 131	..	KONX	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Mariner ⁹ 131	..	KUVK	—	Street, New York (N.Y.)	300, 600	P G	..	N	0.40	United States of America
Steel Navigator	..	KDWL	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Ranger ⁹ 131	..	KDGL	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Scientist ⁹ 131	..	KDVW	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Seafarer ¹¹⁰	..	KDVN	—	Street, New York (N.Y.)	300, 450, 600	P G	..	X	—	United States of America
Steel Trader ⁹ 131	..	KUVL	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Voyager ⁹ 131	..	KUFN	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Steel Worker ⁹ 131	..	KDBJ	300	Street, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	United States of America
Stegelborg ⁴⁰	..	OGO	200	Street, New York (N.Y.)	300, 450, 600, 800	P G	..	X	0.40	Denmark
Steigerwald ³⁵	..	DSL	200	(Armateurs) A. F. Klaveness & Co., Christiania	300, 600	P G	..	X	0.40	Germany
Steinstad ¹	..	AQAJ	75 100	Compagnie de Vapeurs Français, 1, Rue des Mathurins, Paris	300, 600	P G	..	X	0.40	Norway
Stella FDL ¹	..	FDL	300	Nederland - Koninklijke Nederlandsche Stoomboot, Maatschappij, Amsterdam	300, 600	P G	..	X	—	France
Stella TXK ¹	..	TXK	150	Navigatione Libera Trieste	300, 600	P G	..	X	0.40	Holland
Stella UTG ¹²	..	UTG	140	Stellar F. Schlotman	300, 600	P G	..	X	—	Italy
Stellaris ⁹ 131	..	KIFL	150	—	300, 450, 600	P G	..	X	0.20	United States of America
Stentor ¹¹	..	YOJ	300	—	300, 600	P G	..	X	0.40	Great Britain
Stepan Makarov	..	RBK	—	—	300, 600	O	..	X	0.40	Russia
Stephen ¹⁹	..	GBWL	—	—	300, 600	P G	..	X	0.40	Great Britain
Stephen ¹⁹	..	MDJ	170	—	300, 600	P G	..	X	0.40	Great Britain
Stephen R. Jones ²	..	KXX	200	Crowell & Thurlow, S.S. Co., 131, State St., Boston (Mass.)	300, 450, 600	P G	..	X	—	United States of America
S. Teresa ⁹ 131	..	WLIA	300	Grace S.S. Co., 7, Hanover Square, New York (N.Y.)	300, 600	P G	..	N	0.40	United States of America
Sterling GEPN	..	GEPN	—	Navy	—	P G	..	—	—	Great Britain
Sterling LDB ¹	..	LDB	160	(Armateurs) A/S Ganger Rølt, Christiania	300, 600	P G	..	N	0.28	Norway
Sterrett ⁹⁹	..	NTB	—	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Stesso ¹⁰	..	GJCW	250	—	300, 450, 600	P G	..	X	0.40	Great Britain
Stevens ⁹⁸	..	NAPK	—	—	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Stewart ¹⁰²	..	NUNN	—	Navy	300, 600	P G	..	N	—	United States of America
S. Theresa, DSX ³⁵	..	DSX	200	—	300, 600	P G	..	X	0.40	Germany

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Francs.	Minimum per Word. Radio-tele-gram.	
S. Thomas ¹	FOH	300	Société Navale de l'Ouest, Paris	300, 600	PG ..	X	0.40	—	France
S. Tiago CUT ¹	CUT	100-150	—	300, 600	PG ..	N	0.40	4.00	Portugal
Stige ¹	IBE	—	Navy (Armateurs) A. F. Klaveness & Co. Christiania	—	PG ..	X	—	—	Italy
Stiktestad ¹	ARE	100-150	Société Maritime Auxiliaire de Transports, Nantes	300, 600	PG ..	X	0.40	4.00	Norway
Stilbe ¹	UGS	200	Rederiaktiebolaget Sverige Nordamerika-Gothenburg, Gothenburg-New York Line	300, 600	PG ..	N	0.40	—	France
Stockholm ¹	SGL	256	Great Central Railway Co. ..	300, 600	PG ..	X	0.40	4.00	Sweden
Stockport ²¹	ODZ	—	U.S. Steel Products Co., 30, Church St., New York (N.Y.)	300, 600	PG ..	X	0.15 ⁸¹	1.50 ⁸²	Great Britain
Stockton KDDS ⁸⁷	KDDS	300	Navy	300, 600	PG ..	X	0.20	—	United States of America
Stockton NEO ⁸⁶	NEO	—	Operated by T. & J. Brocklebank, Ltd., Cunard Building, Liverpool	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Stockwell ²¹	GZJ	250	Navy	300, 450, 600	PG ..	X	0.40	—	Great Britain
Stoddert ⁸⁶	NALZ	—	Navy (Armateur) N. Chr. Evensen, Christiania	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Stoke ¹	GKOR	—	Maatschappij Stoomschip Rijswijk, Rotterdam	—	PG ..	X	0.40	—	Great Britain
Stokke ¹	TTY	200	(Armateur) S. O. Stray & Co., Ltd., A/S, Christiansand, S.	300, 600	PG ..	X	0.40	4.00	Norway
Stolwijk ¹	HEW	150	(Armateur) Dampskibsfælselskapet, Storborg, Haugesund	300, 600	PG ..	X	0.40	4.00	Holland
Storaker ¹	ARJ	150-175	(Armateur) S. O. Stray & Co., Ltd., A/S, Christiansand, S.	300, 600	PG ..	X	0.40	4.00	Norway
Storborg ¹	LCU	700-1,000	(Armateur) Dampskibsfælselskapet, Storborg, Haugesund	300, 600	PG ..	X	0.40	4.00	Norway
Stören ¹	OWV	—	Aktieselskabet Det Store Nordiske Telegrafelskab, Copenhagen	600	O ⁸ ..	X	— ⁸	— ⁸	Denmark
Store Nordiske ¹	OZJ	250	(Armateur) Harald Grieg Martens, Bergen	300, 600	P ..	X	— ⁸	— ⁸	Denmark
Storfeld ¹	TQP	200	Navy	300, 600	PG ..	X	0.40	4.00	Norway
Stork GEPR ²¹	GEPR	—	General Steam Navigation Co., Ltd.	—	PG ..	X	—	—	Great Britain
Stork YKK ²¹	YKK	—	Navy	300, 600	PG ..	X	0.40	—	Great Britain
Stormcloud	GEPS	—	U.S. Shipping Board, Washington	—	PG ..	N	—	—	United States of America
Storm King KDJM ^{9 121}	KDJM	—	—	300, 450, 600	PG ..	N	—	—	United States of America

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum, per Radio-telegram.	
Sturgeon ..	GEPX	—	Navy ..	—	P G	—	—	—	Great Britain
Sturmel's ..	DRP	200	—	300, 600	P G	X	0.40 111	4.00	Germany
Sturtevant ..	NUJP	—	Navy ..	300 600	P G	N	0.40 112	—	United States of America
Stuyvesant ..	PEJ	250	Koninklijke, West Indische, Maatschappij, Amsterdam	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	Holland
Styr's ..	UDT	250	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Sua Kamrenindhu	HGN	—	Government	300 600	O	N	—	—	Siam
Suarez No. 1 ..	TND	300	Maritima Suarez, Vigo	300, 600	P G	N	0.30	3.00	Spain
Suarez No. 2 ..	TMU	100	Maritima Suarez, Vigo	300, 600	P G	N	0.30	3.00	Spain
Sua Tayanhol	HGD	—	Government	300, 600	O	N	—	—	Siam
S. Ubald ..	GFKL	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Sub-Chaser 23 ..	NOBQ	—	Navy ..	300 600	P G	N	0.20 111 0.40 112	—	United States of America
Sub-Chaser 37 ..	NODF	—	Navy ..	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Sub-Chaser 62 ..	NODM	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 63 ..	NODN	—	Navy ..	300 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 64 ..	NODP	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 69 ..	NODR	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 71 ..	NODT	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 93 ..	NOFX	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 100 ..	NOGJ	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 102 ..	NOGL	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 104 ..	NOGN	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America
Sub-Chaser 106 ..	NOGQ	—	Navy ..	300, 600	P G	N	0.40 111 0.20 112	—	United States of America

Sub-Chaser 119 ⁸⁸	NOJB	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 121 ⁸⁹	NOJM	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 143 ⁸⁹	NOKN	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-chaser 145 ⁸⁹	NOKQ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-chaser 147 ⁸⁹	NOKR	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 154 ⁸⁹	NOLC	—	Navy	..	..	300, 600	PG ..	N	0.40 111 0.20 112	United States of America
Sub-Chaser 156 ⁸⁹	NOLF	—	Navy	..	..	300, 600	PG ..	N	0.40 111 0.20 112	United States of America
Sub-Chaser 159 ⁸⁹	NOLK	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 177 ⁸⁹	NOLR	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 185 ⁸⁹	NOMD	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 186 ⁸⁹	NOMF	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 188 ⁸⁹	NOMJ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 190 ⁸⁹	NOML	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 191 ⁸⁹	NOMM	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 192 ⁸⁹	NOMN	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 195 ⁸⁹	NOMR	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 210 ⁸⁹	NONN	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 214 ⁸⁹	NONS	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 223 ⁸⁹	NOPF	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 224 ⁸⁹	NOPG	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 229 ⁸⁹	NOPN	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 231 ⁸⁹	NOPQ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 232 ⁸⁹	NOPR	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 237 ⁸⁹	NOPZ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 251 ⁸⁹	NOQQ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 253 ⁸⁹	NOQS	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 263 ⁸⁹	NORJ	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 264 ⁸⁹	NORK	—	Navy	..	..	300, 600	PG ..	N	0.40 112 0.20 111	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radiogram.	
Sub-Chaser 270 ⁸⁰	NORR	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
Sub-Chaser 271 ⁸⁰	NORS	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America
Sub-Chaser 273 ⁸⁰	NORV	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 276 ⁸⁰	NOSB	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 277 ⁸⁰	NOSC	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 278 ⁸⁰	NOSD	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 283 ⁸⁰	NOSL	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 284 ⁸⁰	NOSM	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 287 ⁸⁰	NOSQ	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 294 ⁸⁰	NOTB	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 298 ⁸⁰	NOTG	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 299 ⁸⁰	NOTJ	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 303 ⁸⁰	NOTN	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 305 ⁸⁰	NOTQ	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 306 ⁸⁰	NOTR	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 308 ⁸⁰	NOTT	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 310 ⁸⁰	NOTX	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 320 ⁸⁰	NOVC	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 326 ⁸⁰	NOVL	—	Navy	300, 600	PG ..	N	0.40 112 0.20 111	—	United States of America
Sub-Chaser 328 ⁸⁰	NOVN	—	Navy	300, 600	PG ..	N	0.20 111 0.40 112	—	United States of America

Sub-Chaser 332 ⁸⁹	NOVS	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 112	United States of America
Sub-Chaser 340 ⁹⁰	NOXF	—	Navy	..	..	300, 600	PG	..	N	0.40 111 0.20 112	United States of America
Sub-Chaser 341 ⁸⁹	NOXG	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 353 ⁸⁹	NOXS	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 408 ⁸⁹	NOZC	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 409 ⁹⁰	NOZD	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 412 ⁸⁹	NOZJ	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 413 ⁸⁹	NOZK	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 419 ⁸⁹	NOZR	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 424 ⁸⁹	NOZZ	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 425 ⁸⁹	NIQB	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 427 ⁸⁹	NIQD	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 432 ⁸⁹	NIQL	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 439 ⁸⁹	NIQT	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 440 ⁸⁹	NIQV	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 441 ⁸⁹	NIQX	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 443 ⁸⁹	NIRB	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Sub-Chaser 444 ⁸⁹	NIRC	—	Navy	..	..	300, 600	PG	..	N	0.40 112 0.20 111	United States of America
Submarine H 21	GKOT	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 22	GKOV	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 23	GKOW	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 24	GKOX	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 25	GKOY	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 26	GKOZ	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 27	GKUB	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 28	GKUC	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 29	GKUD	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 30	GKUF	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 31	GKUJ	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 32	GKUL	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 33	GKUM	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 34	GKUN	—	Navy	..	..	—	PG	..	—	—	Great Britain
Submarine H 43	GKUQ	—	Navy	..	..	—	PG	..	—	—	Great Britain

Line	Ship	Year	Country	Value	Notes
Submarine L 22	Submarine L 22	1892	Great Britain	—	
Submarine L 23	Submarine L 23	1892	Great Britain	—	
Submarine L 24	Submarine L 24	1892	Great Britain	—	
Submarine L 25	Submarine L 25	1892	Great Britain	—	
Submarine L 26	Submarine L 26	1892	Great Britain	—	
Submarine L 27	Submarine L 27	1892	Great Britain	—	
Submarine L 33	Submarine L 33	1892	Great Britain	—	
Submarine L 52	Submarine L 52	1892	Great Britain	—	
Submarine L 53	Submarine L 53	1892	Great Britain	—	
Submarine L 54	Submarine L 54	1892	Great Britain	—	
Submarine L 56	Submarine L 56	1892	Great Britain	—	
Submarine L 69	Submarine L 69	1892	Great Britain	—	
Submarine L 71	Submarine L 71	1892	Great Britain	—	
Submarine M 1	Submarine M 1	1892	Great Britain	—	
Submarine M 2	Submarine M 2	1892	Great Britain	—	
Submarine M 3	Submarine M 3	1892	Great Britain	—	
Submarine R 1	Submarine R 1	1892	Great Britain	—	
Submarine R 2	Submarine R 2	1892	Great Britain	—	
Submarine R 3	Submarine R 3	1892	Great Britain	—	
Submarine R 4	Submarine R 4	1892	Great Britain	—	
Submarine R 7	Submarine R 7	1892	Great Britain	—	
Submarine R 8	Submarine R 8	1892	Great Britain	—	
Submarine R 9	Submarine R 9	1892	Great Britain	—	
Submarine R 10	Submarine R 10	1892	Great Britain	—	
Submarine R 11	Submarine R 11	1892	Great Britain	—	
Submarine R 12	Submarine R 12	1892	Great Britain	—	
Submarine X 1	Submarine X 1	1892	Great Britain	—	
Submarine A 1	Submarine A 1	1892	Great Britain	—	
Submarine A 2	Submarine A 2	1892	Great Britain	—	
Submarine A 3	Submarine A 3	1892	Great Britain	—	
Submarine B 1	Submarine B 1	1892	Great Britain	—	
Submarine B 13	Submarine B 13	1892	Great Britain	—	
Success	Success	1892	United States of America	300, 600	
Sucrosa	Sucrosa	1892	United States of America	300, 450, 600	
Sucubaco	Sucubaco	1892	United States of America	300, 600	
Sud (El)	Sud (El)	1892	United States of America	300, 450, 600	
Sudawsonco	Sudawsonco	1892	United States of America	300, 450, 600	
Sudbury BIV	Sudbury BIV	1892	United States of America	300, 600	
Sudbury KRZ	Sudbury KRZ	1892	United States of America	300, 450, 600	
Sudufico	Sudufico	1892	United States of America	300, 600	
Sudurco	Sudurco	1892	United States of America	300, 450, 600	
Suedia	Suedia	1892	Sweden	300, 600	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Suedco ^{9 121}	..	—	Submarine Boat Corporation, II, Pine St., New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Suelco ^{9 121}	..	—	Submarine Boat Corporation, II, Pine St., New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Suevic ¹⁹	..	230	—	300, 450, 600	P G	X	0.40	—	Great Britain
Suevier ¹⁹	..	150-200	Lloyd Royal Belge, Antwerp	2,100, 2,200	P G	X	0.40	4.00	Belgium
Suez Maru ¹	..	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Suffolk GRV ¹⁹	..	300	—	300, 600	P G	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 0100	0.40	—	Great Britain
Suffolk WRS ^{9 131}	..	300	Coastwise Transportation Co., 40, Central St., Boston (Mass.)	300, 450, 600	P G	X	0.40	—	United States of America
Sugillenco	..	—	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
S. Ugon ¹⁹	..	—	Navy	300, 450, 600	P G O	X	0.40	—	Great Britain
Suholo ^{9 121}	..	—	—	300, 600	P G	N	—	—	Siam
Suippe	..	300	Submarine Boat Corporation, II, Pine St., New York (N.Y.)	300, 450, 600	P G	X	0.20	—	United States of America
Sujameco ¹¹³	..	—	Navy	300, 800	P G	N	0.05	—	France
Su Jerseyco ¹¹³	..	—	Submarine Boat Corporation, II, Pine St., New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Suki Maru ¹	..	Day 300	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
	Tatsuuma Kisen Kabushiki, Kaisha	300, 800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Sulanierco ¹¹³	..	300	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 450, 600	P G	X	0.20	—	United States of America
Sulima ¹⁹	..	—	—	300, 600	P G	X	0.40	—	Great Britain
Sulina ¹	..	250	Federiaktiebolaget Levanten, Gothenburg	300, 600	P G P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden

Shipboard Stations

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Sultan ³³	200	DSU	—	—	300, 600	P G	0.40	4.00	Germany
Sutania ¹⁹	—	ZLQ	—	—	300, 600	P G	0.40	—	Great Britain
Suma ¹	—	JLL	..	..	—	O	..	..	—¹¹¹	—	Japan
Sumac ⁹⁹	—	NASG	..	..	300, 600	P G	..	..	0.20 111	—	United States of America
Sumanco	—	KDDH	..	..	300, 600	P G	..	..	0.20	—	United States of America
Sumatra CGP ¹⁷	150	CGP	..	..	—	O	..	..	—	—	Australian Commonwealth
Sumatra IPB ¹⁷	190	IPB	..	..	300, 600	P G	..	..	0.40	—	Italy
Sumatra PGM ¹	250	PGM	..	..	300, 450, 600, 800	P G	..	..	0.40	4.00	Holland
Sumatra SGD ¹	350	SGD	..	..	300, 600	P G	..	..	0.40	4.00	Sweden
Sumatra Maru ¹	500	JCU	..	..	300, 600, 1,800	P G	..	..	0.40	—	Japan
Sumbawa	60	PLF	..	..	300, 600	O ³⁹	..	..	—	—	Dutch East Indies
Sumida ¹	—	JWG	..	..	—	O	..	..	—	—	Japan
Summerleaf ⁹⁷	300	KUGR	..	..	300, 450, 600	P G	..	..	0.40	—	United States of America
Summer ⁹⁹	—	NUOX	..	..	300, 600	P G	..	..	—	—	United States of America
Sun ^{9 131}	300	KTU	..	..	300, 600	P G	..	..	0.40	—	United States of America
Sunbank ¹⁹	—	GCYN	..	..	300, 600	P G	..	..	0.40	—	Great Britain
Sunbeam ^{9 131}	300	KODC	..	..	300, 600	P G	..	..	0.40	—	United States of America
Sunditi ¹⁹	—	GCYM	..	..	300, 600	P G	..	..	0.40	—	Great Britain
Sundance ¹⁰³	300	KORD	..	..	300, 600	P G	..	..	0.40	—	United States of America
Sunelseco ^{9 131}	300	KUSC	..	..	300, 450, 600	P G	..	..	0.40	—	United States of America
Sunewarkoo ¹¹³	—	KDNI	..	..	300, 600	P G	..	..	0.20	—	United States of America
Sunewco ^{9 131}	300	KDBR	..	..	300, 450, 600	P G	..	..	0.20	—	United States of America
Sunfield ¹⁹	—	GCYL	..	..	300, 600	P G	..	..	0.40	—	Great Britain
Sunflower ⁹⁰	—	NUFM	..	..	300, 600	P G	..	..	0.20 111	—	United States of America
Sungshan Maru ¹	200	JEC	..	..	300, 600	P ³⁰	..	..	0.40 112	—	Japan
Sunhaven ⁵⁰	100	GJBF	..	..	300, 450, 600	P G	..	..	0.40	—	Great Britain
Sunheath ⁹⁰	100	ZMH	..	..	300, 450, 600	P G	..	..	0.40	—	Great Britain
Sunuk ¹⁹	170	YEA	..	..	300, 600	P G	..	..	0.40	—	Great Britain
Sunland ¹⁹	120	ZET	..	..	300, 600	P G	..	..	0.40	—	Great Britain
Sunlite ^{9 131}	150	KPQ	..	..	300, 450, 600	P G	..	..	0.40	—	United States of America

Standard Oil Co. of N.J., Incorp.,
26, Broadway, New York (N.Y.)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Sunnadin ¹⁰	NEVB	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹² 0.10 ⁸⁷ 0.40	—	United States of America
Sunningdale ¹²	OFO	115	Société Anonyme d'Armement	300, 600	P G	X	1.00 ⁸⁷	—	Great Britain
Sunovo ¹²	OSTA	300	d'Industrie et de Commerce, 99, Avenue de France, Antwerp	450, 600, 800	P G	X	0.40	—	Belgium
Suroil ^{10 111}	KWP	200	Sun Company, Finance Building, Philadelphia (Pa.)	300, 450, 600	P G	X	0.40	—	United States of America
Sunpath ¹²	GMZ	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	0.40	—	Great Britain
Sunray ^{10 11}	BAN	150	Suomen Valtamerentakainen Kauppa O.Y., Helsingfors	300, 600	P G	X	0.40	—	Great Britain
Sunugentco ¹¹²	KDNX	—	Suomen Valtamerentakainen Kauppa O.Y., Helsingfors	300, 600	P G	X	0.20	—	United States of America
Suomen Neito ¹⁰	OJAB	250	Suomen Valtamerentakainen Kauppa O.Y., Helsingfors	300, 600	P G	X	0.15	0.75	Finland
Suomen Polka	OJZ	175	Suomen Valtamerentakainen Kauppa O.Y., Helsingfors	300, 600	P G	X	0.15	0.75	Finland
Superb	GLEF	—	Navy	—	P G	—	—	—	Great Britain
Suphenco	KDRP	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Suportco ^{10 111}	KUZK	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Surabaya Maru ¹⁰	JHQ	200	Osaka Shosen Kaisha (Osaka, Mercantile Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Surada ¹⁰	GDNR	—	—	300, 600	P G	X	0.40	—	Great Britain
Suralt	KDBS	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Surat ¹⁰	GCPQ	170	—	300, 600	P G	N	0.40	—	Great Britain
Suremico	KDHB	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Sureway ¹⁰	YXL	—	—	300, 600	P G	X	0.40	—	Great Britain
Suricho ^{10 111}	KDHA	—	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Surico ^{10 111}	KDDP	300	Submarine Boat Corporation, 11, Pine Street, New York (N.Y.)	300, 450, 600	P G	X	—	—	United States of America
Surinath ¹⁰	KDCY	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America

Suriname ⁹⁸	200	United Fruit S.S. Corpn.	300, 450, 600	PG	N	0.40	United States of America
Surva Monthou ¹	150	Navy	300, 600	O	N	0.40	Siam
Surmulet ¹	150	Bouclit Fils Zouquin, Canu & Cie (Armateurs), Boulogne-sur-Mer	300, 600	PG	X	0.40	France
Surrey ¹⁹	180	New York and Oriental S.S. Com-pany	300, 600	PG	X	0.40	Great Britain
Sutraga ^{9 181}	300	Navy	300, 450, 600	PG	X	0.40	United States of America
Surveillante	—	Navy	300, 800	PG	N	0.05	France
Surveyor ⁹⁹	—	Navy	300, 600	PG	N	0.20 11	United States of America
Surville ¹	200	Compagnie des Chargeurs de l'Ouest, 2, Rue de Brea, Nantes	300, 600	PG	X	0.40 112	France
Sisana II ²	300	Madrigal & Co., Manila (Philippine Islands)	300, 450, 525, 600	PG	X	0.20	United States of America
Susolanco ¹¹³	300	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 450, 600	PG	X	0.20	United States of America
Susherico	—	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	PG	X	0.20	United States of America
Suspectaco ¹¹³	—	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	PG	X	—	United States of America
Susquehanna ¹⁰⁸	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	N	0.40	United States of America
Susquehanna WEM ⁹	200	Susquehanna S.S. Co. ..	300, 450, 600	PG	X	0.40	United States of America
Sussex ¹⁹	240	—	300, 600	PG	X	0.40	Great Britain
Sutermco ¹¹³	300	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 450, 600	PG	X	0.20	United States of America
Sutherland ⁹⁷	200	U.S. Shipping Board, Washington (D.C.)	300, 476, 600	PG	X	0.40	United States of America
Sutherland Grange ¹⁰	180	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	PG	X	0.40	Great Britain
Sutlej ¹¹	125	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 450, 600	PG	X	0.40	Great Britain
Sutorpco ^{2, 11}	—	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	PG	X	0.20	United States of America
Sutransco ⁹	300	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 450, 600	PG	X	0.40	United States of America
Sutton	—	Navy	—	PG	X	—	Great Britain
Sutton Hall ¹⁰	150	—	300, 600	PG	X	0.40	Great Britain
Suva ¹	200	—	300, 600	PG	X	0.20	Australian Commonwealth
Suvene ¹⁹	180	—	300, 600	PG	X	0.40	Great Britain
Suwa Maru ¹	450	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600, 1,800	PG	N	0.40	Japan
Suwanee ¹⁹	160	—	300, 600	PG	X	0.40	Great Britain
Suwarinco ¹¹	—	Submarine Boat Corporation, II, Pine Street, New York (N.Y.)	300, 600	PG	X	—	United States of America
Suwiad ⁰³	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimump Radio-telegram.	
Suwo ¹	JUG	—	Navy	—	O	—	—	—	Japan
Suwordenco	KDLE	—	Submarine Boat, Corporation R., Pine Street, New York (N.Y.)	300, 600	P G	X	—	—	United States of America
Suzanné et Marie	FWZ	300	Worms & Cie., Paris	300, 600	P G	X	0.40	—	France
Suzanne Micheline ¹	UJH	150	Transports Maritime de l'Etat	300, 600	P G	X	0.40	—	France
Svardskén ¹	OVIW	—	Navy	600	O ³	X	—	—	Denmark
Svalen	SCT	180	Navy	300, 600	O ³⁰	X	—	—	Sweden
S. Valerio ¹	MHZ	200	(Armateurs) D/S A/S Erich Lea, Bergen	300, 600	P G	X	0.40	—	Great Britain
Svine ¹	ASS	—	Aktieselskabet Dampskibsselskabet Valkyrien, Copenhagen	300, 600	P G	X	0.20	—	Norway
Svanbild ⁴⁰	—	—	Rederiaktiebolaget Transatlantic, Gothenburg	—	—	—	—	—	Denmark
Svarten ¹	SIS	250	—	300, 600	P	—	0.40	4.00	Sweden
Svartfond ¹	ATF	150-175	(Armateur) ¹ Signal Bergensen, Stavanger	300, 600	P G	X	0.40	4.00	Norway
Svarton ¹	SLS	250	Tranaktiebolaget Grängesberg Oxelösund, Stockholm	300, 600	P	—	0.40	4.00	Sweden
Svea	SBA	—	Navy	—	O ³⁰	—	—	—	Sweden
Svein Jarl ¹	LWJ	150-200	(Armateurs) ¹ Det. Nordenfjeldske Dampskibsselskab, Trondhjem	300, 600	P G	X	0.40	4.00	Norway
Svend II. ⁴⁰	—	—	Aktieselskabet Det Forenede Dampskibsselskab, Copenhagen	—	—	—	—	—	Denmark
Svend Foyn I. ¹	LEC	400	(Armateurs) ¹ A/s, Sydhavet (P. Borgen), Sandefjord	300, 600	P G	X	0.40	4.00	Norway
Svenskund	SCK	—	Navy	—	O ³⁰	—	—	—	Sweden
Sverige	SCL	—	Navy	—	O ³⁰	—	—	—	Sweden
S. Verónica ^{9 131}	KDHT	150	American & Cuban S.S. Line, 34, Cortland St., New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America

Sverre ¹	LDY	150	(Armateurs) S. M. Kuhnle & Son, Bergen	300, 600	P G	X	0.40	4.00	Norway
S. V. Harkness ^{9 121}	KEU	300	Standard Oil Co. of N. J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Sviatogor RDB	RDB	300-350	—	600	O	X	—	—	Russia
S. Vincent ⁴¹	CUP	100-150	—	300, 600	P G	X	0.40	4.00	Portugal
S. Vincent ⁴¹	FOP	150	Société Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—	France
Svoron ¹⁹	BKG	—	—	300, 600	P G	X	0.40	—	Great Britain
Swanby ¹⁹	ZYO	160	—	300, 600	P G	X	0.40	—	Great Britain
Swallow GEPZ	GEZ	—	Navy	—	P G	X	—	—	United States of America
Swallow NEFL ⁹⁹	NEFL	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Swan GACJ	GACJ	—	Navy	—	P G	N	0.20 111 0.40 112	—	Australian Commonwealth
Swan NIJP ⁹⁹	NIJP	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Swasey ⁹⁹	NIGP	—	Navy	300, 600	P G	N	0.40	—	Great Britain
Swazi ¹⁰	MAV	160	—	300, 600	P G	X	0.40	—	Japan
Sweden Maru ¹	JSF	500	Kawasaki Kisen Kaisha	300, 600	P G	X	0.40	—	United States of America
Sweethope ¹⁰	XHZ	140	—	300, 600	P G	X	0.40	—	Great Britain
Swift Arrow ^{9 121}	KDOS	300	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.40	—	United States of America
Swift Eagle ^{9 121}	KDRK	300	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.40	—	United States of America
Swiftlight ^{9 121}	KDSA	300	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.40	—	United States of America
Swift Scout	KDQV	150	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.20	—	United States of America
Swiftstar ^{9 121}	KDPF	300	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.40	—	United States of America
Swiftsure	KDNG	300	Swiftsure Oil Transport Co.	300, 450, 600	P G	X	0.40	—	United States of America
Swiftway ¹⁹	YAV	—	United States Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	Great Britain
Swift Wind	KDSI	—	—	300, 450, 600	P G	X	0.40	—	Australian Commonwealth
Swirburne ¹⁹	EBR	160	Navy	300, 600	P G	X	0.40	—	France
Swordsmen	GACK	—	Compagnie des Chargeurs Français Pisson & Cie, Paris	—	P G	X	0.40	—	Great Britain
Sybl	FKB	—	Navy	—	P G	X	0.40	—	Norway
Sybylle	GEQC	125-150	(Armateur) M. Clausen, Hauge- sund	300, 450, 600	P G	X	—	4.00	Denmark
Sydney ¹	LHX	—	Aktieselskabet Dampskibsselskabet Atlantenhavet, Copenhagen	300, 450, 600	P G	X	0.40	4.00	Sweden
Sydhavet ⁴⁶	OHD	250	Rederiaktiebolaget, Transatlantic (Gothenburg — Australia Line)	800	P	X	0.40	—	—
Sydic ¹	SGF	250	Gothenburg	300, 600	P	X	0.40	—	—
Sydney	GACL	—	Navy	—	P G	X	—	—	Australian Commonwealth
Sydney Maru ¹	JNP	400	Kokusai Kisen Kaisha	300, 600	P G	X	0.40	—	Japan
Sydney ONYA ¹⁰	ONYA	200-250	Association Maritime, Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radio-telegram.	
Sydney Reid ¹⁹	XIL	150	(Armateur) Joh. Ludw. Mowinkel	300, 600	PG	X	0.40	—	Great Britain
Sydney ¹	LDI	75-100	Bergen	300, 600	PG	X	0.40	4.00	Norway
Syph GEOD	GEOD	—	Navy	—	PG	—	—	—	Great Britain
Syph NTL ¹⁹	NIL	—	Navy	—	PG	—	0.20 111 0.40 112	—	United States of America
Sylvan Arrow ¹³¹	KSX	250	Standard Transportation, 26, Broadway, New York (N.Y.)	300, 600	PG	—	0.40	—	United States of America
Sylvia Victoria ²¹	VGDQ	200	Forbes Corporation, 25, Beaver Street, New York (N.Y.)	300, 600	P	— 27	—	—	Canada
Syria FJS ¹	FJS	350	Compagnie Française de Navigation à Vapeur, Cyprien Fabre & Cie, Marseilles	300, 600	PG	X	0.40	—	France
Syria GBXK ¹⁹	GBXK	250	—	300, 600	PG	X	0.40	—	Great Britain
Syrian Prince ¹⁹	GBRJ	—	—	300, 600	PG	X	0.40	—	Great Britain
Syros KDEC ¹³¹	KDEC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	—	United States of America
Syros TKG ¹	TKG	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	PG	X	0.40	4.00	Greece
S. Zeferino ¹⁹	MPS	200	—	300, 600	PG	X	0.40	—	Great Britain
S. Zotic ¹⁹	GBRY	—	—	300, 600	PG	X	0.40	—	Great Britain
T. 1 ¹⁹	NILB	—	Navy	300, 600	PG	N	0.20 111 0.40 112	—	United States of America
T. 2 ¹⁹	NABB	—	Navy	300, 600	PG	N	0.20 111 0.40 112	—	United States of America
T. 3 ¹⁹	NABZ	—	Navy	300, 600	PG	N	0.20 111 0.40 112	—	United States of America
T. 139 ¹	ALQ	—	Navy	—	O	N	—	—	Germany
T. 141 ¹	ALS	—	Navy	—	O	N	—	—	Germany
T. 143 ¹	ALC	—	Navy	—	O	N	—	—	Germany
T. 144 ¹	ALY	—	Navy	—	O	N	—	—	Germany
T. 146 ¹	ALX	—	Navy	—	O	N	—	—	Germany
T. 148 ¹	ALZ	—	Navy	—	O	N	—	—	Germany
T. 149 ¹	AEA	—	Navy	—	O	N	—	—	Germany
T. 151 ¹	AFB	—	Navy	—	O	N	—	—	Germany
T. 152 ¹	AFC	—	Navy	—	O	N	—	—	Germany
T. 153 ¹	AFD	—	Navy	—	O	N	—	—	Germany

T. 154 ¹	..	APE	—	Navy	..	—	—	N	—	Germany
T. 156 ¹	..	AFG	—	Navy	..	—	—	N	—	Germany
T. 157 ¹	..	AFH	—	Navy	..	—	—	N	—	Germany
T. 158 ¹	..	AFI	—	Navy	..	—	—	N	—	Germany
T. 168 ¹	..	AFK	—	Navy	..	—	—	N	—	Germany
T. 175 ¹	..	AFM	—	Navy	..	—	—	N	—	Germany
T. 185 ¹	..	AFN	—	Navy	..	—	—	N	—	Germany
T. 190 ¹	..	AFO	—	Navy	..	—	—	N	—	Germany
T. 196 ¹	..	AFP	—	Navy	..	—	—	N	—	Holland
Tabanan ¹	..	PFH	225	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	..	300, 600	PG	0.40	4.00	—
Tabarka ¹⁹	..	EWN	135	—	..	300, 600	PG	—	—	Great Britain
Tabatinga ¹⁵	..	PUB	150	Lloyd Brasileiro, Rio de Janeiro..	..	300, 600	PG	0.40	—	Brazil
Tablada ¹	..	TKS	150	Naveira Sevillana S.A. Sevilla	..	300, 600	PG	0.30	3.00	Spain
Tabor ¹	..	ASQ	150-175	(Armateur) Wihl. Wilhelmson, Christiania	..	300, 600	PG	0.40	4.00	Norway
Tachibana Maru ¹	..	JAGA	400	Taikoku Sekiyu Kaisha	..	300, 600	PG	0.40	—	Japan
Tacoma GZH ²	..	GZH	150	Standard Transport Co., Ltd.	..	300, 450, 600	PG	—	—	Hong Kong
Tacoma Maru ¹	..	JTA	350	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	..	300, 600	PG	0.40	—	Japan
Tacoma NUA ⁹⁹	..	NUA	—	Navy	..	300, 600	PG	0.20 111 0.30 111 0.40 111	—	United States of America
Tacony ¹⁰²	..	WUAE	—	—	..	300, 600	PG	—	—	United States of America
Tactician ^{..}	..	GEOF	—	Navy	..	—	PG	—	—	Great Britain
Tadousac ⁹⁹	..	NAZQ	—	Navy	..	300, 600	PG	0.20 111 0.40 111	—	United States of America
Taina EOC ¹⁰	..	EOC	170	Compagnie de Navigation Mixte	..	300, 600	PG	0.10	—	Great Britain
Taina FXT ^{58 1}	..	FXT	150	a) Vapeur, Marseilles	..	300, 600	PG	—	—	France
Tahchee ¹	..	GVB	150	Standard Transport Co., Ltd.	..	300, 450, 600	PG	—	—	Hong Kong
Tahiti ⁷¹	..	MYN	250	Operated by the Amalgamated Wireless (Australia), Ltd.	..	300, 600	PG	0.40 ⁸¹	—	Great Britain
Tahure ^{..}	..	FBTH	—	Navy	..	300, 800	PG	0.05	—	France
Taian Maru ¹	..	JAFB	200	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	..	300, 600	PG	0.40	—	Japan
Taibu Maru ¹	..	JEU	400	Kokusai Kisen Kaisha	..	300, 600	PG	0.40	—	Japan
Taichu Maru ¹	..	JTC	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	..	300, 600	PG	0.40	—	Japan
Taiho Maru ¹	..	JHV	400	Kokusai Kisen Kaisha	..	300, 600	PG	0.40	—	Japan
Taihoku Maru ¹	..	JBKA	200	—	..	300, 600	PG	0.40	—	Japan
Taikai Maru ¹	..	JEE	400	Taiwan Seto Kaisha	..	300, 600	PG	0.40	—	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Taikwa Maru ¹	JTK	200	Yamashita Kisen (Kabushiki) Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Taillebourg	FAIG	—	Navy	300, 800	P G	N	0.95	—	France
Tainan Maru ¹	JTN	300	Osaka Shosen Kaisha (Osaka Mercantile Steamship Co.)	300, 600	P G	N	0.40	—	Japan
Taihu ¹	MWF	200	—	300, 450, 600 2,100, 2,200	P G	X	0.40	—	Great Britain
Tairoa ¹	GCZN	—	—	300, 600	P G	X	0.40	—	Great Britain
Taisan Maru ¹	JFW	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Taisei Maru ¹	JTM	300	Shosen Gakko (Mercantile Marine School)	300, 600	P G	N	0.40	—	Japan
Taishin Maru ¹	JDMA	200	Tatsuma Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Taito Maru ¹	JFT	400	Uchida Kisen Kabushiki Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Taiyo Maru ¹	JAHA	500	Toyo Kisen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Taiyuan	GVBFB	—	—	—	—	—	—	—	Hong Kong
Tajima Maru ¹	JPJ	400	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Takada ¹	MOR	230	—	300, 600	P G	X	0.40	—	Great Britain
Takao ¹	JQY	—	Navy	—	O	—	—	—	Japan
Takaoka Maru ¹	JNK	400	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Taketoyo Maru ¹	JTU	400	Nippon Yusen Kaisha (Japan Mail Steamship Co.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Talabot ¹	LFI	500	(Armateurs) N. S. Bjønness & Son, Tønsberg	300, 500, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00	Norway

Talaraité ²¹	..	CJK	200	International Toronto, Ont.	Petroleum Co.,	300, 600 800	P G	..	— ²⁷	0.40	—	Canada
Talawa ¹	..	VXD	200	—	—	300, 600	P G	..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.40	—	Australian Commonwealth
Talbot ⁹⁹	..	NAPL	—	Navy	..	300, 600	P G	..	..	0.20 111 0.40 112	—	United States of America
Talcahuano	..	CDR	250	(Armateurs) A/S D. Finne's Rederi,	..	300, 600	—	..	..	—	—	Chile
Talisman ¹	..	ASL	100-125	Skoien, Christiania	..	300, 600	P G	..	..	0.40	4.00	Norway
Tallahassee ⁹⁹	..	NUC	—	Navy	..	300, 600	P G	..	..	0.20 111 0.40 112	—	United States of America
Tallapoosa ²	..	NRV	200	U.S. Coast Guard Treasury Dept.,	..	600, 756 953	P G	..	..	0.20 111 0.40 112	—	United States of America
Taltal	..	CDR	250	Gonzalez Sofia & Cia, Calle	..	300, 600	P G	..	..	0.40 112	4.00	Chile
Taithybuil ¹⁹	..	GSH	155	Blanco, 849, Valparaiso	..	300, 450, 600	P G	..	..	0.40	—	Great Britain
Talune ¹¹	..	GBVK	—	Amalgamated Wireless (Austral-	..	300, 600	P G	..	..	0.40 11	—	Great Britain
Tama ¹	..	JLD	—	Asia), Ltd.	..	—	Q	..	..	—	—	Japan
Tamaha ¹	..	GSG	150	Standard Transport Co., Ltd.	..	300, 450, 600	P G	..	..	0.40	—	Hong Kong
Tama Maru ¹	..	JFI	400	Tokyo Kaifu Kaisha	..	300, 600, 1,800	P G	..	..	0.40	—	Japan
Tamar ¹⁹	..	MPG	—	—	..	300, 600	P G	..	..	0.40	—	Great Britain
Tamara II. ⁵⁵	..	DXS	200	—	..	300, 600	P G	..	..	0.40	4.00	Germany
Tamarac ¹⁹	..	ZIC	150	—	..	300, 600	P G	..	..	0.40	—	Great Britain
Tanarua ¹¹⁰	..	NVR	—	—	..	300, 600	P G	..	..	0.40	—	United States of America
Tamatsu Maru ¹	..	JTP	400	Kokusai Kisen Kaisha	..	300, 600	P G	..	..	0.40	—	Japan
Tamba Maru ¹	..	JTB	400	Nippon Yusen Kaisha (Japan Mail	..	300, 600	P G	..	..	0.40	—	Japan
Tambora ¹	..	PFC	225	Steamship Company)	..	1,800	P G	..	..	0.40	4.00	Holland
Tambooy ¹⁹	..	ZOA	—	Stoomvaart Maatschappij, Rotter-	..	300, 600	P G	..	..	0.40	—	Great Britain
Tambre ²	..	EEZ	150	damsche Lloyd, Rotterdam	..	300, 600	P G	..	..	0.30	3.00	Spain
Tamesi ^{9 121}	..	WTE	300	Compania	..	300, 600	P G	..	..	0.40	—	United States of America
Tamesis ¹	..	TLM	150	Barcelona	..	300, 450	P G	..	..	0.30	3.00	Spain
Tamiahua ²	..	KDVA	—	Sinclair Navigation Company, 120, Broadway, New York (N.Y.)	..	300, 450, 800	P G	..	..	—	—	United States of America
Tamon Maru No. 8 ¹	..	JOX	200	Garrigós é Hijos Grao (Valencia)	..	300, 600	P G	..	..	0.40	—	Japan
Tamora ¹⁹	..	GBYS	—	Southern Pacific Company, Pier	..	300, 450, 600	P G	..	..	0.40	—	United States of America
Tampa KOVX ^{9 131}	..	KOVX	300	49, North River, New York (N.Y.)	..	300, 600	P G	..	..	0.40	—	Japan
	..			Hachima Kanasuke	..	—	P G	..	..	0.40	—	Great Britain
	..			U.S. Shipping Board, Washing-	..	300, 450, 600	P G	..	..	0.40	—	United States of America
	..			ton (D.C.)	..	300, 450, 600	P G	..	..	0.40	—	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Tampa NITC ¹¹⁶	NITC	—	Crowell & Thurlow S.S. Co., 131, State Street, Boston (Mass.)	300, 600	P G	N	—	—	United States of America
Tampico ²	KOXR	—	Tetsudoshō (Ministry of Railways) (Armateur) Wilh. Wilhelmsen, Christiania	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tanura Maru ¹	JTR	100	—	300, 600	O	X	0.40	—	Japan
Tana ¹	AVO	200-250	(Armateur) Wilh. Wilhelmsen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Tanafjord ¹	TTJ	150-200	(Armateur) Den Norske Amerikalinje A/S Christiania	300, 600	P G	X	0.40	4.00	Norway
Tanager ⁹⁹	NABS	—	—	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tanamo ¹⁴⁸	KVN	300	Atlantic Fruit Co., 61, Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
Tancarville ^{9 131}	KUKM	150	Philippine Vegetable Oil Co., Manila (Philippine Islands)	300, 600	P G	X	0.40	—	United States of America
Tanche	FAOG	—	Navy	600, 800	P G	N	0.05	—	France
Tancored GEQJ	GEQJ	—	Navy	—	P G	—	—	—	Great Britain
Tancored LGU ¹	LGU	400-500	(Armateur) Wilh. Wilhelmsen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Tanda ¹⁹	MSH	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Tanfield ¹⁹	ZNU	150	—	300, 600	P G	X	0.40	—	Great Britain
Tanger ¹	UEW	150	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Tangistan ¹⁹	ZZA	—	—	300, 600	P G	X	0.40	—	Great Britain
Tango Maru ¹	JTG	450	Nippon Yusen Kaisha, (Japan Mail Steamship Co.)	300, 600, 1,800	P G	N	0.40	—	Japan
Tangoreño ¹	EFM	150	Uriarte y Cia, Desierto-Erandio	300, 600	P G	N	0.30	3.00	Spain
Tantah ¹⁹	EMZ	100	—	300, 600	P G	X	0.40	—	Great Britain
Tantalus ¹	PES	150-200	Stoomvaart Maatschappij Oceaan, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Taormina ¹⁷	IYT	270	Stoomvaart Maatschappij Oceaan, Genova	300, 450, 600	P G	N	0.40	—	Italy
Tapage	FAGT	—	Navy	300, 800	P G	N	0.05	—	France
Tapagese	FETA	—	Navy	300, 800	P G	N	0.05	—	France
Tapajoz ¹⁵	PPA	250	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	N	0.40	—	Brazil
Tapanoeli ¹	OLN	200	Stoomvaart Maatschappij Rotterdamse Lloyd Rotterdam	300, 600	P G	X	0.40	—	Holland

Tapperehen	..	SBI	—	Navy	300, 450, 600	O ³⁷	—	0.40	Great Britain
Tapti ⁷¹	..	GCWX	250	Simons Bros. & Co., Ltd., Wool- wich, London, S.E.18	300, 600	P G	..	0.40	Great Britain
Tapton ¹⁹	..	ZUG	170	Periera Carneiro & Co., Ltd., Rio	300, 500, 600	P G	..	0.40	Brazil
Taquary ²	..	PPS	200	de Janeiro	300, 600	P G	..	0.40	Great Britain
Tara GBXL ¹⁹	..	GBXL	225	—	300, 600	P G	..	—	Great Britain
Tara GEQK	..	GEQK	—	Navy	300, 600	P G	..	0.40	Great Britain
Tarasay ¹⁹	..	OCW	150	—	300, 600	P G	..	0.40	Great Britain
Tarantia ⁸⁰	..	YRE	—	Admiralty	300, 600	P G	..	—	Great Britain
Tarauto ^{..}	..	IHF	—	Navy	—	—	..	—	Italy
Tarantula	..	GFW	—	Navy	—	P G	..	—	Great Britain
Tarautant	..	CNT	120	Ship belonging to the Morocco Customs Administration	300	O	..	—	Morocco
Tarawera ³	..	VMF	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	..	0.20 ¹¹ 0.20 ^{11a} 0.40 ^{11a}	New Zealand United States of America
Tarbell ⁹⁹	..	NEZP	—	Navy	300, 600	P G	..	0.20 ⁸ 0.40 ⁸	Australian Commonwealth
Tarcoola ^{..}	..	VZN	300	—	300, 600	P G	..	0.40 ⁸	Australian Commonwealth
Tarno	..	OIL	250	Ice-breaker belonging to the State	400, 600	O	..	—	Finland
Tarban	..	SCV	—	Navy	—	O ³⁹	..	—	Sweden
Taroba ¹⁹	..	GBXR	225	—	300, 600	P G	..	0.40	Great Britain
Tarpon	..	GEOL	—	Navy	—	P G	..	—	Great Britain
Tarasa ¹	..	TLS	100	Sociedad Anonima Astilleros, Mediterranea, Barcelona	300, 600	P G	..	0.30	Spain
Tartar ⁹⁷	..	KEKS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	0.40	United States of America
Tartar Prince ¹⁹	..	ZLY	150	—	300, 600	P G	..	0.40	Great Britain
Tartu	..	AZV	—	Standard Transportation Company, Ltd.	300, 450, 600	O	..	—	Estonia
Tascalsa ^{..}	..	GWBK	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	—	Hong Kong
Tashmoo ³	..	KOXD	—	—	300, 600	P G	..	0.40	United States of America
Tasmania GACM	..	GACM	—	Navy	300, 600	P G	..	—	Australian Commonwealth
Tasmania CBPS ¹⁹	..	GBPS	—	—	300, 600	P G	..	0.40	Great Britain
Tasmanian Transport ¹⁹	..	ZEI	13*	Rederiaktiebolaget Transatlantic	300, 600	P	..	0.40	Great Britain
Tasmanian Transport ¹⁹	..	SFG	250	Gothenburg (Gothenburg— Australia Line)	300, 600	P	..	0.40	Sweden
Tasso ¹⁹	..	GJMZ	—	—	300, 450, 600	P G	..	0.40	Great Britain
Tasuja ^{16 1}	..	AZY	300	—	600, 700, 1,100	PR ¹⁸	..	0.20	Estonia

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Tajana ¹ ..	TTR	250-300	(Armateurs) Winge & Co., Christ- iania	300, 600	PG ..	X	0.40	4.00	Norway
Tatnuck ²⁹ ..	NETQ	—	Navy ..	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tatsuno Maru ¹ ..	JPU	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	PG ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tatsuta ¹ ..	JLQ	—	Navy ..	—	O ..	—	—	—	Japan
Tattnall ²⁹ ..	NEPS	—	Navy ..	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tattoo ..	GACN	—	Navy ..	—	—	—	—	—	Australian Commonwealth
Taubat ¹³ ..	STO	100	Lage & Irmãos, Rio de Janeiro	300, 600	PG ..	N	0.40	—	Brazil
Taurus AVX ¹ ..	AVX	200-250	(Armateur) Wilh. Wilhelmson, Christiania	300, 600	PG ..	N	0.40	4.00	Norway
Taurus GEQP ²¹ ..	GEQP	—	Navy ..	—	PG ..	—	—	—	Great Britain
Tavernilla ..	KEMT	200	Panama Canal	400, 600	—	—	—	—	United States of America
Tavium ²¹ ..	GFYL	—	Amalgamated Wireless (Austral- asia), Ltd.	—	—	—	—	—	Great Britain
Taxandrier ¹⁹ ..	OFF	150	—	300, 600	PG ..	N	0.40	—	Great Britain
Taylor NALR ²⁹ ..	NALR	—	Navy ..	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Taylor NITB ¹⁰² Taza ¹ ..	NITB FQZ	160	Compagnie Générale Transatlan- tique, Paris	300, 600 300, 600	PG .. PG ..	N	0.40	—	United States of America
Tchad ¹ ..	FCQ	600	Compagnie des Chargeurs Réunis, Paris	300, 600	PG ..	N	0.40	—	France
Teal ²⁹ ..	NAPN	—	Navy ..	300, 600	PG ..	N	0.40	—	United States of America
Teazer ..	CEQR	—	Navy ..	300, 600	PG ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tebe ¹⁷ ..	LYD	190	Sicilia Società de Navigazione, Rome	300, 600	PG ..	N	0.40	—	Italy
Teconate ..	KDST	—	Atlantic Gulf Oil Corporation	300, 600	PG ..	N	—	—	United States of America
Teconsh ..	BLR	150	Standard Transport Co., Ltd.	300, 450, 600	PG ..	N	—	—	Hong Kong
Teental ²¹ ..	YPP	—	Operated by "A. Holt & Co., Managers, Liverpool	300, 450, 600	PG ..	N	0.40	—	Great Britain
Tees ²¹ ..	VPK	200	Cahadian Pacific Railway	300, 600	PG ..	— ²⁷	—	—	Canada
Teesbridge ¹⁹ ..	VOX	140	—	300, 600	PG ..	N	0.40	—	Great Britain
Teespool ¹⁹ ..	YBK	180	—	300, 600	PG ..	N	0.40	—	Great Britain
Teesta ¹⁹ ..	GBYS	210	—	300, 600	PG ..	N	—	—	Great Britain

Tegucigalpa ⁹	VB	Vaccaro Bros. & Co.	300, 450, 600	P G	X	0.40	Honduras (Republic)
Teitistas ¹¹	ZJZ	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	Great Britain
Teist	LAS	Navy	—	O	—	—	Norway
Tejo	CTI	—	300, 600	O	—	—	Portugal
Tekoa G.F.Q. ¹⁹	G.F.Q.	—	300, 450, 600	P G	X	0.40	Great Britain
Tekoa K.O.X. ^{19 121}	K.O.X.	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Tela ¹	ASY	(Amateur) Brodrene Wilhelmsen, Bergen	300, 600	P G	X	0.40	Norway
Telamon ¹¹	ZKA	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	Great Britain
Telonia ¹¹	MCJ	Operated by the Telegraph Con- struction & Maintenance Co., Ltd., 38, Old Broad Street, London, E.C.2	300, 600	P	X	—	Great Britain
Telegraaf ¹¹	PLA	Government (Cable Ship)	300, 600, 1000	O	—	—	Dutch East Indies
Telemachos ¹	THK	P. Draconis, Piraeus	300, 600	P G	X	0.40	Greece
Telemachus G.E.Q.S	G.E.Q.S	Navy	—	P G	—	—	Great Britain
Telemachus ZAI ¹¹	ZAI	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G	X	0.40	Great Britain
Telesfora de Larinaga ¹⁹	G.Z.Q.	Ship Salvage Corporation, Ltd.	300, 600	P G	X	0.40	Great Britain
Teuma ¹¹	M.Z.D.	—	300, 600	P	X	—	Great Britain
Tén éaire	F.B.Z.T	Navy	300, 800	P G	N	0.05	France
Tempalsan Maru ¹	J.P.Z	Mitsui Bussan Kaisha	300, 600, 1300	P G	—	0.40	Japan
Tempest	G.E.Q.T	Navy	—	P G	—	—	Great Britain
Tempete ¹	U.H.N	Société Maritime Nationale, 5, Rue Boudreau, Paris	300, 600	P G	X	0.40	France
Tennus ¹⁹	O.C.F	Navy	300, 900	P G	X	0.40	Great Britain
Tenacious	G.E.V	—	—	P G	—	—	Great Britain
Tenally ²⁷	K.O.Z.F	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Tenbury ¹⁹	G.F.S.Z	Navy	300, 450, 600	P G	X	0.40	Great Britain
Tenedos G.E.Q.W	G.E.Q.W	—	—	P G	—	—	Great Britain
Tenedos S.Z.I	S.Z.I	Navy	—	O	—	—	Greece
Teneriffa ¹¹	U.E.K	Transports Maritimes de l'Elat (Amateur)	300, 600	P G	X	0.40	France
Teneriffa TUA ¹	TUA	(Amateur) Wilh. Wilhelmsen, Christiania	300, 450, 600, 800	P G	X	0.40	Norway
Tenkai Maru ¹	J.C.N	Taiwan Setto Kaisha	300, 600	P G	—	0.40	Japan
Tennessee AWL ¹	AWL	(Amateur) Wilh. Wilhelmsen, Christiania	300, 450, 600, 800	P G	X	0.40	Norway
Tennessee NSE ¹⁹	NSE	Navy	300, 600	P G	N	0.20 ¹²¹ 0.40 ¹²²	United States of America
Tennyson ¹⁹	G.D.G	—	300, 600	P G	N	0.40	Great Britain
Tenryu ¹	J.L.P	Navy	—	O	—	—	Japan
Tenshin Maru ¹	J.B.IA	Kobe Shosen Kaisha	300, 600	P G	—	0.40	Japan

Shipboard Stations—Continued

Name.	Call S'nal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Tensho Maru JCH ¹	JCH	400	Ogura Koichiro ..	300, 600	P G ..	0800 to 1100 1400 to 1700	0.40	—	Japan
Tensho Maru JDNA ¹	JDNA	150	Hakuyo Shosen Kaisha ..	300, 600	P G ..	2000 to 2400 0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tensift ¹ ..	FPU	—	Compagnie de Navigation Paquet, Marseilles	—	P G ..	N	0.40	—	France
Tento ¹ ..	LWW	100-125	(Armateur) J. W. Prebensen, Risør	300, 600	P G ..	X	0.40	—	Norway
Tenyo Maru ¹ ..	JTY	450	Toyo Kisen Kaisha (Oriental Steamship Company)	300, 600	P G ..	N	0.40	—	Japan
Teodoro Llorente ²	EET	150	Compania Transmediterranea, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Terawhiti ²	VMH	60	Union S.S. Co. of N.Z., Ltd.	300, 600	PR ²³ ..	X	0.20	—	New Zealand
Teresa Fabregas ¹ ..	CXT	150	Compania de Navegacion Fabregas y Garcia, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Teresao ¹⁷ ..	ITA	140	Ente Coton Trasporto, Genoa	300, 600	P G ..	X	0.40	—	Italy
Teresa Pamies ¹ ..	EFE	150	Compania de Navegacion Fabregas y Garcia, Barcelona	300, 600	P G ..	N	0.30	3.00	Spain
Teresa Tayá ¹ ..	ECR	150	Hijos de Jose Taya, Barcelona.	300, 600	P G ..	N	0.30	3.00	Spain
Teresa TKT ¹ ..	TKT	100	Ricardo Ortiz Artinano, Bilbao ..	300, 600	P G ..	N	0.30	3.00	Spain
Teresa WJF ¹⁷ ..	WJF	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Tern ¹⁹ ..	NIKT	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Ternate ¹ ..	PGF	150	Stoomvaart Maatschappij Rotterdamse Lloyd, Rotterdam	300, 600	P G ..	X	0.40	—	Holland
Terne ¹ ..	ASW	200	Fjosanger, Bergen	300, 600	P G ..	X	0.40	—	Norway
Terneuzen ¹ ..	OMX	200	A. C. Lensen's Stoomvaart Maatschappij, Terneuzen	300, 450 600, 800	P G ..	X	0.40	—	Holland
Terra Nova	VYB	—	NILD Coastal	—	—	—	—	—	Newfoundland
Terre Haute ^{9 121} ..	KOPJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Terre-Nouve ²	FYQ	200	Joseph Huret, 8, Rue Cornielle, Bordeaux	300, 450 600, 800	P G ..	X	0.40	—	France
Terrier ¹ ..	ATA	150-175	(Armateur) Wilh. Wilhelmson, Christiania	300, 600	P G ..	X	0.40	—	Norway
Terror EHS	EHS	—	Navy	—	O	—	—	—	Spain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram	
Themisto ¹	..	200	Maatschappij Zeevaart (Rotterdam)	300, 800	P G	X	0.40	4.00	Holland
Themistocles MGM ¹⁹	..	250	—	300, 800	P G	X	0.40	—	Great Britain
Themistocles SVT ¹	..	220	The National Steam Navigation Co., Ltd., of Greece, Athens	300, 450, 600	P G	N	0.40	4.00	Greece
Theodore F. Reynolds ¹⁰⁸	..	150	Steamship Theodore F. Reynolds Corporation	300, 450, 600	P G	X	0.40	—	United States of America
Theodore H. Wickwire ¹	..	150	American S.S. Company	300, 800	P G	X	0.10 ¹¹⁹	—	United States of America
Theodore H. Wickwire, Jr. ¹	..	150	American S.S. Company	300, 800	P G	X	0.10 ¹¹⁹	—	United States of America
Theodore Roosevelt TRK ¹	..	200-250	(Armateurs) Fred. Olsen & Co., Christiania	300, 800	P G	X	0.40	4.00	Norway
Theodore Roosevelt WCT ¹	..	150	Cleveland Erie S.S. Co., ..	300, 800	P G	X	0.10	—	United States of America
WCT # 131	..	100-150	A. Bistis Co., London	300, 800	P G	X	0.40	4.00	Greece
Theofano ¹	..	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Therese Horn ²⁵	..	200	Lloyd Brasileiro, Rio de Janeiro	300, 800	P G	N	0.40	—	Brazil
Therestina ²	..	—	Operated by A. Holt & Co., Managers, Liverpool	300, 800	P G	X	0.40	—	Great Britain
Thesus ⁷¹	..	—	Operated by the Liverpool, Brazil and River Plate S.N. Co., 101, Royal Liver Buildings, Liverpool	300, 800	P G	X	0.40	—	Great Britain
Thespis ⁷¹	..	—	—	—	—	—	—	—	—
Thessaly ¹⁹	..	160	Navy	300, 800	P G	X	0.40	—	Great Britain
Thetis AKX ¹	..	—	Navy	600, 800	P G	N	0.05	—	France
Thetis FARY	..	—	Navy	600	P G	N	—	—	Denmark
Thetis OVI ¹	..	—	Navy	—	O	—	—	—	Greece
Thetis SYZ	..	—	Navy	—	O	—	—	—	Norway
Thetis VYW	..	—	Navy	—	O	—	—	—	Canada
Thiepval ¹	..	100	Dominion Government, Department of Marine and Fisheries	300, 600	O	X	—	—	France
Thionville	..	—	Navy	600, 800	P G	N	0.05	—	Great Britain
Thiabe	..	—	Navy	—	P G	X	—	—	Great Britain
Thistle GDVF ¹⁹	..	—	Navy	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Thistle GFOX	..	—	Navy	300, 600	P G	X	—	—	Great Britain
Thistlemore ¹⁹	..	180	Navy	300, 600	P G	X	0.40	—	Great Britain
Thistleton ¹⁹	..	130	(Armateur) With, Christiania	300, 600	P G	X	0.40	—	Great Britain
Thode Fagelund ¹	..	150-200	—	300, 600	P G	X	0.40	4.00	Norway

Ship	Call	Frequency	Power	Station	Country	Notes
Thomas NIFEN ⁹⁹	NIFEN	300	600	U.S. Army Transport, War Department, Washington (D.C.)	United States of America	0.40 ¹¹²
Thomas WXM ²	WXM	300	600	Andrew F. Mahony	United States of America	0.40 ¹¹¹
Thomas Crowley	KDSB	—	300, 600	Government Merchant Marine, Montreal, P.Q.	Canada	0.40 ¹¹²
Thomas Drummond ²⁰	CHY	200	300, 600, 800	Haugesund	Norway	0.40
Thomas Haaland ²	LCB	100-125	300, 600	Standard Oil Company of N.J., Incorp., 26 Broadway, New York (N.Y.)	United States of America	0.40
Thomas H. Wheeler ^{9 131}	KDOR	300	300, 600	(Armateur) Jan. O. Ostervold, Bergen	Norway	0.40
Thomas Krag ¹	ATO	300	—	Crowell and Thurlow S.S. Co., 131 State Street, Boston (Mass.)	United States of America	—
Thomas P. Beal	KDIO	—	—	Navy	Chile	—
Thompson CBL	CBL	—	—	Navy	United States of America	—
Thompson NAZC ⁹⁹	NAZC	—	300, 600	(Armateur) Bryde & Dahls, Hvalfangerselskap, A/S Sandefjord	Great Britain	0.20 ¹¹¹
Thongwa ¹⁹	GBWV	210	300, 600	Navy	Norway	0.40 ¹¹²
Thor. I. I.	AGC	400	300, 600	Bjorgvarfjelag Vestmannaeyjar, Vestmannaeyjar	Norway	0.40
Thor SBE	SBE	—	—	(Armateur) O.T. Tønnevoild, Grimstad	Norway	0.40
Thor TFI ¹	TFI	100	300, 600	Navy	Norway	—
Thoritis ¹	LDE	500	300, 500, 600	(Armateur) Björn Björnstad & Co., Christiania.	Norway	0.40
Thorlön	SCH	—	—	(Armateur) O. T. Tønnevoild, Grimstad	Norway	—
Thergerd ¹	TRP	Day 150 Night	300, 600	(Armateur) O. T. Tønnevoild, Grimstad	Norway	0.40
Thorhild ¹	TRS	300 150-175	300, 600	Société Anonyme des Anciens Etablissements Charles Leborgne, 74 Rue la Boétie, Paris	Norway	0.40
Thorium ¹	FPP	350	300, 600	Navy	Norway	0.40
Thornbury ¹⁹	GDKX	130	300, 600	Dutée W. Flint	Norway	0.40
Thornton ⁹⁹	NWX	—	300, 600	Kveldulur Co., Reykjavik	Norway	0.40
Thorobred ²	KYZ	—	300, 600	(Armateur) Melsom & Melsom, Naiset (Larvik)	Norway	0.40
Thorolfur	TFO	150	300, 600	—	Norway	0.40
Thorpe Grange ¹⁹	YWP	230	300, 600	—	Norway	0.40
Thorsdall ¹	AVS	150-175	300, 600	—	Norway	0.40
Thorsten ¹	AZT	200	300, 600	—	Norway	0.15

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range, in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radio-telegram.	
Three Hundred and Twenty Three Thrush ⁹⁶ ..	KDTH	—	John B. Paine	—	—	—	—	—	United States of America
Thruster ⁹⁷ ..	NIKS	—	Navy	300, 600	PG	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
T. H. Skogland ¹ ..	GERB AWW	200-250	Navy (Armateurs) T. H. Skogland & Sønn A/s. Haugesund	300, 600	PG PG	— X	0.40 0.40	— 4.00	Great Britain Norway
T. H. Skogland ¹⁹ ..	GBRQ PXP	150	Van Nievelt Goudriaam Stoom-vaart Maatschappij, Rotterdam	300, 600 300, 450 600, 800	PG PG PG	X X X	0.40 0.40 0.40	— 4.00	Great Britain Holland
Thule SFC ¹ ..	SBC SFC	—	Navy Raderiktelohaget Thule, Gothenburg-London Line, Gothenburg	300, 600	O 1 PG	— N	— 0.40	— 4.00	Sweden Sweden
Thunderer ¹ ..	GEGR GBVZ	—	Navy	300, 600	PG PG	— X	— 0.40	—	Great Britain
Thyella ¹ ..	SYT SKA	250	Navy Aktielohaget Transmarin, Helsingborg	300, 600	PG P	— —	— 0.40	—	Greece Sweden
Thyra SKA ¹ ..	TCJ	100-150	National Steam Navigation Co., Ltd., of Greece, Athens	300, 600	PG	—	0.40	—	Greece
Thysa ¹⁹ ..	GDBK EYJ	150	—	300, 600 300, 600	PG PG	X —	0.40 0.40	—	Great Britain Great Britain
Tiara ¹⁹ ..	—	—	—	—	—	—	—	—	—
Tibagy ² ..	PPU	200	Companhia Commercio e Navegação, Rio de Janeiro	300, 500, 600	PG	N	0.40	—	Brazil
Tiberton ²¹ ..	YGW KOU	—	Green Star Steamship Corporation, 120, Broadway, New York (N. Y.)	300, 600 300, 450, 600	PG PG	X X	0.40 0.40	—	Great Britain United States of America
Tidewater ^{9 121} ..	BMN TMA	—	Compañia Vasco-Valenciana de Navegación, Bilbao	300, 450, 600 300, 600	PG PG	X N	0.40 0.30	— 3.00	Great Britain Spain
Tideway ¹⁹ ..	AUZ	200-250	Armateurs) A/S Vestlandske Petroleumcompagni, Bergen	300, 600	PG	X	0.40	4.00	Norway
Tilis ² ..	—	—	—	—	—	—	—	—	—
Tiger AUZ ¹ ..	GDTX GEDC KIT	—	Navy Standard Transportation Co., 26,	300, 600 300, 450, 600	PG PG PG	X X X	0.10 ⁹⁷ — —	— — —	Great Britain Great Britain

Tigre	IBBC	—	Navy	300, 600	P G	..	..	..	0.40	—	Belgium
Tigre UIM ¹	UIM	180	Lorient	300, 600	P G	..	..	..	0.40	4.00	Great Britain
Tigris ¹⁰	ONT	100-150	Compagnie Nationale Belge de Transports, Maritimes, Antwerp	—	P G	..	..	..	—	4.00	Sweden
Tilbury	GERC	—	Navy	300, 600	P	..	..	0600 to 0700	0.40	—	United States of America
Tilia ¹	SMQ	150	Rederiaktiebolaget Svenska Lloyd, Gottenburg	—	P	..	..	1100 to 1200	0.40	—	United States of America
Tillamook ²⁷	WMOA	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	1400 to 1500	0.20 ¹¹¹	—	Norway
Tillman ²⁹	NEQT	—	Navy	300, 600	P G	..	..	1800 to 1900	0.40 ¹¹²	4.00	Chile
Tilthorn ¹	AWF	400	(Armateurs) D/S A/S Britannia, Bergen	300, 600	P G	..	..	—	—	—	Italy
Tiltil	CDX	—	Jackson & Cia., Calle Blanco, 862, Valparaiso	—	—	..	..	—	0.40	—	Australian Commonwealth
Timavo ¹⁷	IVM	190	Navigazione Libera Triestina, Trieste	300, 600	P G	..	..	0930 to 1030	0.20 ⁸	—	—
Time ¹	VIK	300	—	300, 600	P G	..	..	1200 to 1300	0.40 ⁵	—	—
Times ¹	LWT	150-200	(Armateurs) With. Wilhelmssen, Christiania	300, 600	P G	..	..	1400 to 1430	0.40	4.00	Norway
Timgad ^{1 54}	FXQ	250	Compagnie Générale Transatlantique, Paris	300, 600	P G	..	..	1630 to 1730	0.10	—	France
Tingard ¹⁰²	NISB	—	Navy	300, 600	P G	..	..	2030 to 0030 (ship's time)	—	—	United States of America
Tingey ⁵⁹	NWY	—	—	300, 600	P G	..	..	—	0.20 ¹¹¹	—	United States of America
Ting Sang ¹⁵	GFKV	—	National Steam Navigation Co., Ltd., of Greece, Athens	300, 450, 600	P G	..	..	—	0.40 ¹¹²	—	Great Britain
Tines ¹	TGN	100-150	Navy	300, 600	P G	..	..	—	0.40	4.00	Greece
Tintagel	GERD	—	Navy	—	P G	..	..	—	—	—	Great Britain
Tintamarre	FBPT	—	Navy	300, 800	P G	..	..	—	0.05	—	France
Tintore ¹	HNP	150	Compagnia Transmediterranea, Barcelona	300, 600	P G	..	..	—	0.30	3.00	Spain
Tintoretto ¹⁹	ZNM	180	Great Lakes Transit Corporation, Buffalo (N.Y.)	300, 600	P G	..	..	—	0.40	—	Great Britain
Tionesta ^{9 31}	WCA	150	Navy	300, 450, 600	P G	..	..	—	0.20	—	United States of America
Tippecanoe ²⁹	NUGV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	..	..	—	0.20 ¹¹¹	—	United States of America
Tipton ²⁷	WQOA	200	(Armateur) With. Wilhelm, Christiania	300, 600	P G	..	..	—	0.40 ¹¹²	—	Norway
Tiradentes AQAX ¹	AQAX	200-250	Navy	300	P G	..	..	—	0.40	4.00	Brazil
Tiradentes SOI	SOT	50	Navy	—	O ¹⁸	..	..	—	—	—	Sweden
Tirfing	SCG	—	Navy	300, 600	P G	..	..	—	0.40	4.00	Germany
Tirpitz ²⁵	DIZ	200	—	300, 450, 600	P G	..	..	—	0.40	—	Great Britain
Tirpitz GFSB ¹⁹	GFSB	—	Marittima Italiana, Società di Navigazione Per Servizi Postali, Genova	300, 600	P G	..	..	—	0.40	—	Italy
Tirreno IMT ¹⁷	IMT	170	—	—	—	..	..	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Mètres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.	Country.
Tirreno ¹ UVM ¹⁷	UVM	140	Lussino, Società Anonima di Navigazione a vapore, Lussimpiccola	300, 600	P G	X	—	Italy
Tirso EFX ¹	EFX	150	Compañia Transmediterranea, Barcelona	300, 600	P G	N	0.30	Spain
Tirso HNH ¹	HNH	150	Hijos de Enrique Girouella Barcelona	300, 600	P G	N	0.30	Spain
Tisaren ¹	SHQ	250	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	Sweden
Tisserand ¹	HVS	200	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	France
Titan DDG ³⁸	DDG	200	Société les Affrèteurs Réunis, Paris	300, 600	P G	X	0.40	France
Titan FIA ¹	FIA	300	Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	N	0.40	France
Titan GSO ⁷¹	GSO	170	Navy	300, 450, 600	P G	X	0.40	Great Britain
Titania GEXI ¹	GEXI	—	Lloyd del Mediterraneo, Società di Navigazione, Rome	300, 600	P G	X	—	Great Britain
Titania IVD ¹⁷	IVD	140	Navy	—	P G	—	0.40	Italy
Titano	IFY	—	Navy	—	—	—	—	Italy
Tiverton GFIQ	GFIQ	—	Navy	—	P G	—	—	Great Britain
Tiverton MXZ ¹⁹	MXZ	140	—	300, 600	P G	X	—	Great Britain
Tivives ⁸⁸	KMI	500	United Fruit S.S. Corporation	300, 600	P G	N	0.40	United States of America
Tizoni ¹	ARN	150-175	(Armateur) K. Andersen, Fredrikstad	300, 600	P G	X	0.40	Norway
Tjaldur ⁴⁰	OHK	200	Aktieselskabet det Forenede Dampskibsselskab, Copenhagen	300, 450 600, 800	P G	X	0.40	Denmark
Tjerimal ¹	OLP	200	Stoomvaart Maatschappij, Rotterdam	300, 450 600, 800	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	Holland
Tjibodas ¹	PLL	100-120	Java, China, Japan Line, Amsterdam	300, 600	P G	X	0.40	Holland

Tjikandi ¹	..	PLW	200	Java, China, Japan Lijn, Amster- dam	300, 450 600, 800	P G	..	^	0.40	4.00	Dutch East Indies
Tjikarang ¹	..	PLS	200	Java, China, Japan Lijn, Amster- dam	300, 450 600, 800	P G	..	X	0.40	4.00	Dutch East Indies
Tjikembang ¹	..	PLH	200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjikini ¹ ..	..	PLM	100-200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjilatjap ¹	..	PLP	150	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjileboet ¹ ..	..	PLQ	150-200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjiluwong ¹	..	PLN	100-200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjinanoeek ¹	..	PLJ	200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjipanas ¹	..	PLO	150	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjislak ¹	..	PLR	150-200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjisondari ¹	..	PLI	200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
Tjitaroen ¹	..	PLK	200	Java, China, Japan Lijn, Amster- dam	300, 600	P G	..	X	0.40	4.00	Dutch East Indies
T. J. Williams ^{9 121}	..	KDUR	300	Standard Oil Co. of N.J. Incorp., 26 Broadway, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	—	United States of America
T. L. Church ¹⁹	..	VGNR	160	Harris and Dixon, London	300, 450 600, 800	P	..	— ²⁷	0.40	—	Canada
T. M. Werner ¹⁰	..	OGW	350	Aktieselskabet Dampskibsselskabet Vendila, Copenhagen	300, 450 600, 800	P G	..	X	0.40	4.00	Denmark
Toba JWK ¹	..	JWK	—	Navy	—	O	..	—	—	—	Japan
Toba Maru ¹	..	JPF	400	Nippon Yusen Kaisha, Japan Mail Steamship Company	300, 600, 1,800	P G	..	—	0.40	—	Japan
Toba TZB ¹	..	TZB	200	Stoomboot Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 450 600, 800	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00	Holland
Tocantins ¹⁵	..	STN	150	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	..	N	0.40	—	Brazil
Toco ¹⁸	..	GJKN	—	Sicilia, Società di Navigazione, Rome	300, 450, 600	P G	..	X	0.40	—	Italy
Torra ¹⁷	..	IYF	140	Amalgamated Wireless (Austra- lia), Ltd.	300, 600	P G	..	X	0.40 ¹¹	—	Great Britain
Tofta ²¹	..	GFYM	250	Kokusai Kisen Kaisha	300, 600	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tofuku Maru ¹	..	JDD	500	Thomas J. Howard	300, 600	P G	..	X	0.40	—	United States of America
Toiler ²	..	WTOO	1000	Navy	—	O	..	—	—	—	Japan
Tokiwa ¹ ..	..	JRB	—	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	..	—	0.10	—	Japan
Tokiwa Mam ¹ ..	..	JYW	400	Kokusai Kisen Kaisha	300, 600	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tokufuku Maru ¹	..	JIM	400	Kokusai Kisen Kaisha	300, 600	P G	..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiogram.	
Tokushima Maru ¹	JTQ	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Toledo Bridge ¹⁶⁸	KONG	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Tolenaide ¹⁷	IMX	140	Sicilia, Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Italy
Töller ¹	HVO	150	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	—	France
Tolken ¹	SKC	250	Federiktskibet Transatlantic, Gothenburg	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Tollard ¹⁹³	KEVN	300	United States Transport Company, 50, Broad St., New York (N.Y.)	300, 600	P G	X	0.20	—	United States of America
Tolosa ⁷¹	BUV	500	Tropical Radiotelegraph Co., 131, State St., Boston, Mass.	300, 600	P G	N	0.40	—	Great Britain
Tolosa AQT ¹	AQT	400	(Armateur) Fearnley & Eger, Christiania	300, 600	P G	X	0.40	4.00	Norway
Tolosa KDAY ⁸⁷	KDAY	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Tolluna ²³	AWG	150-175	(Armateur) With. Wilhelmssen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Tom ¹	TOO	170	Compañia Naviera Bachi, Bilbao	300, 600	P G	N	0.30	3.00	Spain
Tomahawk	GERJ	—	Navy	—	P G	—	—	—	Great Britain
Tomalva ⁸⁷	KDFH	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	—	—	United States of America
Tomimura Maru ¹	JFS	400	Mitsubishi Shoji Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tommaso di Savoia ¹⁷	IYS	190	Lloyd Sabaudo, Società Anonima per Azioni, Genoa	300, 600	P G	N	0.40	—	Italy
Tonia ¹⁹³	KONJ	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	—	—	United States of America

Line	Ship	Year	Flag	Company	Port of Origin	Port of Destination	Capacity (Tons)	Speed (Knots)	Remarks
1	Tonbridge	1901	U.S.	U.S. Shipping Board	Washington (D.C.)	Washington	300	15	
2	Tone 1	1901	U.S.	U.S. Shipping Board	Washington (D.C.)	Washington	300	15	
3	Tone Maru	1901	Japan	Tokio Kaifu Kaisha	Tokyo	Tokyo	400	15	
4	Tonesit	1903	U.S.	U.S. Shipping Board	Washington (D.C.)	Washington	300	15	
5	Tongking	1903	U.S.	Aktieselskabet det Ostasiatiske Kompagni	Copenhagen	Copenhagen	250	15	
6	Tongtong	1903	U.S.	Lloyd Royal Belge (Antwerp)	Antwerp	Antwerp	150-200	15	
7	Toni	1903	U.S.	(Armateurs) H. M. Wrangell & Co.	A/S Haugesund	A/S Haugesund	200	15	
8	Tonjong	1903	U.S.	(Armateurs) H. M. Wrangell & Co.	A/S Haugesund	A/S Haugesund	100-150	15	
9	Tonkino	1903	U.S.	Navy	..	..	—	—
10	Tonopah	1903	U.S.	Navy	..	..	—	—
11	Toopi	1903	U.S.	Navy	..	..	—	—
12	Topa	1903	U.S.	U.S. Shipping Board	Washington (D.C.)	Washington	150	15	
13	Topdalsford	1903	U.S.	U.S. Shipping Board	Washington (D.C.)	Washington	300	15	
14	Topeka	1903	U.S.	(Armateurs) A/S Den Norske, Amerikahjelp, Christiania	..	..	250-300	15	
15	Topila	1903	U.S.	Navy	..	..	—	—
16	Torbay	1903	U.S.	Southern Pacific Co.	Pier 49, North River, New York (N.Y.)	New York (N.Y.)	200	15	
17	Torch	1903	U.S.	Navy	..	..	—	—
18	Tordenskjold	1903	U.S.	(Armateur) Wilh. Wilhelmson, Christiania	..	..	150-175	15	
19	Tordenskjold LAD	1903	U.S.	Navy	..	..	—	—
20	Tordera	1903	U.S.	Compania Transmediterranea, Barcelona	..	..	150	15	
21	Toreador	1903	U.S.	Navy	..	..	200	15	
22	Toreador GERL	1903	U.S.	Navy	..	..	—	—
23	Torgard	1903	U.S.	Rederiaktiebolaget Ocean, Landskrona	..	..	250	15	
24	Torilla	1903	U.S.	GOJ	..	..	190	15	
25	Tortlak Skogland	1903	U.S.	(Armateurs) T. H. Skogland & Son, A/S Haugesund	..	..	100-150	15	
26	Tormontor	1903	U.S.	Freeport and Tampico Fuel Oil Trans. Corp., 150, Broadway, New York (N.Y.)	..	..	150	15	
27	Tormontor	1903	U.S.	Navy	..	..	—	—
28	Torne 1	1903	U.S.	Trafikaktiebolaget Grandsberg, Ongelesund, Stockholm	..	..	150	15	

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Tormentor	..	240	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship s time)	0.40	—	Australian Commonwealth
Toronto GBS	..	220	—	300, 600	P G	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—	Great Britain
Toronto VED	..	100	Canada S.S. Lines, Ltd., Montreal (P.Q.)	300, 600	P G	— ²⁷	0.40	—	Canada
Torontonian	..	100	Operated by the Black Sea Shipping and Mercantile Company, Ltd., 20, Eastcheap, London	300, 450, 600	P G	—	0.40	—	Great Britain
Torpedero No. 1.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 2.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 3.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 4.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 5.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 6.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 7.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 8.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 9.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 10.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 11.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 12.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 13.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 14.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 15.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 16.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 17.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 18.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 19.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 20.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 21.	..	—	Navy	—	O	—	—	—	Spain
Torpedero No. 22.	..	—	Navy	—	O	—	—	—	Spain
Torpedimiera Italiana	..	—	Navy	—	O	—	—	—	Italy
Torpedoboot	..	—	Navy	600	O 30	—	—	—	Holland

Shipboard Stations—Continued

Name;	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Losari ¹	..	150	Stoomvaart Maatschappij "Rotterdamse Lloyd, Rotterdam (Armateurs) Winge & Co., Christiania	300, 450	P G	X	0.40	4.00	Holland
Tosca ¹	..	100-150	(Armateurs) Winge & Co., Christiania	300, 600	P G	X	0.40	4.00	Norway
Tosto TSD ¹⁰	..	100-150	(Armateur) B. Stolt, Neilsen, Haugesund	300, 600	P G	X	0.40	4.00	Norway
Tosto OCQ ¹⁰	..	140	—	300, 600	P G	X	0.10 ⁸⁷	1.50 ⁸⁷	Great Britain
Toteco	..	—	International Petroleum Company	300, 450	P G	X	—	—	United States of America
Totomi Maru ¹	..	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	530, 600	P as	0800 to 1100 1400 to 1700	—	—	Japan
Tottori Maru ¹	..	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Touareg	..	—	Navy	300, 800	P G	N	0.05	—	France
Toucey ⁶⁰	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Toul FBTL	..	150	Transports Maritimes de l'Etat	300, 800	P G	N	0.05	—	France
Toul HSH	..	150	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	X	0.40	—	France
Toulouse ¹	..	200	Bouclat-Fils, Zenequin, Carni & Cie (Armateurs), Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Touquet ¹	..	150	Compagnie Générale Transatlantique, Paris	300, 600	P G	X	0.40	—	France
Touraine ¹	..	300	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	N	0.40	—	France
Tourmaline	..	—	Navy	300, 600	P G	X	—	—	Great Britain
Tours ¹	..	200	Navy	300, 800	P G	N	0.05	—	France
Tourteau	..	—	Navy	300, 800	P G	N	0.05	—	France
Tourterelle	..	—	Navy	300, 800	P G	N	0.05	—	France
Tourville	..	—	Navy	300, 800	P G	N	0.05	—	France
Tower	..	—	Navy	300, 800	P G	N	0.05	—	Great Britain
Toyama Maru ¹	..	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan

Town	Maru ¹	JOV	200	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P.G.	0800 to 1100 1100 to 1700 1700 to 2400	Country
Toyon Maru ¹	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P.G.	0.40	Japan
Toyo-hashi Maru ¹	..	JPT	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P.G.	0.40	Japan
Toyooka Maru ¹	..	JYO	400	Lloyd Triestino Società di Navigazione à Vapore, Trieste	300, 600	P.G.	0.40	Italy
Tracia ¹⁷	..	IUJ	190	Navy Akkieselskabets Dampskibsselskab	330, 600	P.G.	0.20 111 0.40 112	United States of America
Tracy ²⁸	..	NUJL	—	Navy Akkieselskabets Dampskibsselskab	300, 600	P.G.	0.40	Great Britain
Traiford Hall ¹⁸	..	MSL	190	Navy Akkieselskabets Dampskibsselskab	300, 450, 600	P.G.	0.40	Denmark
Tralee ¹⁸	..	GFTS	150	Navy Akkieselskabets Dampskibsselskab	300, 600, 900	O	0.40	Russia
Tranquebar ¹⁰	..	OGI	150	Navy Akkieselskabets Dampskibsselskab	300, 450, 600	P.G.	0.40	Great Britain
Transbalt ¹⁰	..	RBF	300	Navy Akkieselskabets Dampskibsselskab	300, 450, 600	P.G.	0.40	Denmark
Transmitter ⁷¹	..	GOO	150	Eastern Telegraph Co., Ltd.	300, 450, 600	P	0.40	Great Britain
Transportation ^{9 121}	..	KĒJX	300	Coastwise Transportation Co., 40, Central Street, Boston (Mass.)	300, 450, 600	P.G.	0.40	United States of America
Transvaal ¹⁰	..	OGXA	250	Akkieselskabets Dampskibsselskab	300, 450, 600	P.G.	0.40	Germany
Trautentfels ³⁵	..	DBU	200	Navy Akkieselskabets Dampskibsselskab	300, 600	P.G.	0.40	France
Travaillereux ¹⁹	..	FAMT	—	Navy Akkieselskabets Dampskibsselskab	300, 800	P.G.	0.05	Great Britain
Traveller GJKM ¹⁹	..	GJKM	—	Navy Akkieselskabets Dampskibsselskab	300, 450, 600	P.G.	0.40	United States of America
Traveller KIVK ²	..	KIVK	—	Navy Akkieselskabets Dampskibsselskab	300, 600	P.G.	0.40	Portugal
Traz-os-Montes ⁴¹	..	CST	100-150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 800	P.G.	0.40	Great Britain
Trebartha ⁷¹	..	GDWP	250	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P.G.	0.40	Great Britain
Trecarne ¹⁹	..	ZUI	130	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trecarrel ¹⁹	..	GOX	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tredenharn ¹⁹	..	GBCF	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tredennick ⁷¹	..	GDWQ	250	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 450, 600	P.G.	0.40	Great Britain
Trefusis ¹⁹	..	ZTW	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregantle ¹⁹	..	GXA	100	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregarthen ¹⁹	..	ZDE	170	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregenna ¹⁹	..	GCDX	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Treglissou ¹⁹	..	XEM	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregonell ¹⁹	..	XKB	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregothman ¹⁹	..	ENA	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Tregurno ¹⁹	..	ELR	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trehawke ¹⁹	..	ZUF	130	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trekieve ¹⁹	..	GCMV	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trelawny ¹⁹	..	YIS	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trelewan ¹⁹	..	GCWZ	—	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Trellistock ¹⁹	..	GNX	175	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain
Treliske ¹⁹	..	LSO	150	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P.G.	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum, per Radiogram.	
Trelton ¹⁰	GCKV	—	—	300, 600	PG	X	0.40	—	Great Britain
Trenaton ¹⁰	GOY	—	—	300, 600	PG	X	0.40	—	Great Britain
Trenayne ¹⁰	LUIJ	155	—	300, 600	PG	X	0.40	—	Great Britain
Tremeadow ¹⁰	XUJ	155	—	300, 600	PG	X	0.40	—	Great Britain
Trenere ¹⁰	GBLC	—	—	300, 600	PG	X	0.40	—	Great Britain
Tremiti ¹⁰	IFZ	—	—	300, 600	PG	X	0.40	—	Italy
Tremorvah ¹⁰	GBPJ	190	Navy	300, 600	PG	X	0.40	—	Great Britain
Trenchant ¹⁰	GERS	—	Navy	—	PG	—	—	—	Great Britain
Treneglos ¹⁰	XKC	150	—	300, 600	PG	X	0.40	—	Great Britain
Trentino ¹⁰	GRX	140	Lloyd Triestino Società di Navigazione a Vapore, Trieste	300, 600	PG	X	0.40	—	Great Britain
Trento ¹⁰	IUP	—	—	300, 600	PG	X	0.40	—	Italy
Trenton ¹⁰	NISR	—	—	300, 600	PG	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Tres Hermanos ¹⁰	TLG	150	J. Martinez Fernandez, S. Eugenia de Ribeira	300, 600	PG	N	0.30	3.00	Spain
Tresilian ¹⁰	XUO	130	—	300, 600	PG	X	0.40	—	Great Britain
Tresthney ¹⁰	GBFW	—	—	300, 600	PG	X	0.40	—	Great Britain
Trevadhan ¹⁰	BAB	140	—	300, 600	PG	X	0.40	—	Great Britain
Trevanion ¹⁰	YCI	130	—	300, 600	PG	X	0.40	—	Great Britain
Trevanack ¹⁰	GOM	190	—	300, 600	PG	X	0.40	—	Great Britain
Trevaylor ¹⁰	YGG	130	—	300, 800	PG	X	0.40	—	Great Britain
Trevelan ¹⁰	XLK	170	—	300, 600	PG	X	0.40	—	Great Britain
Trevor ¹⁰	GBRX	—	Navy	300, 600	PG	X	0.40	—	Great Britain
Trevor ¹⁰	NUMP	—	—	300, 600	PG	X	0.20	—	United States of America
Trevorbyn ¹⁰	GCBP	—	—	300, 600	PG	X	0.40	—	Great Britain
Trevethoe ¹⁰	ZUH	150	—	300, 600	PG	X	0.40	—	Great Britain
Trevether ¹⁰	OEF	140	—	300, 600	PG	X	0.40	—	Great Britain
Trevier ¹⁰	OPT	150-200	Lloyd Royal Belge, Antwerp	300, 600	PG	N	0.40	4.00	Belgium
Trevilly ¹⁰	YIW	115	—	300, 600	PG	X	0.40	—	Great Britain
Trevince ¹⁰	YRX	130	—	300, 600	PG	X	0.40	—	Great Britain
Trevish ¹⁰	ZGR	105	—	300, 600	PG	X	0.15 ⁸² 1.50 ⁸³	—	Great Britain
Trevithick ¹⁰	GCXZ	—	—	300, 600	PG	X	0.40	—	Great Britain
Trevor ¹⁰	GDWR	250	Siemens Bros. & Co., Ltd., Woolwich, London	300, 450, 600	PG	X	0.40	—	Great Britain

Treviso ¹³	XXKD	120	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trevelard ¹⁹	GIE	130	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trevidden	BMT	130	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trewinard ¹³	GPZ	—	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trewyn ¹³	GCW	—	—	—	300, 600	P G	..	—	—	—	Great Britain
Triad	GFUN	—	—	—	—	P G	..	—	—	—	Norway
Tribune	GERI	—	—	—	—	P G	..	X	0.40	4.00	Norway
Tribolor ¹	ASZ	150-175	—	—	300, 600	P G	..	—	—	—	France
Trident FBVT	FBVT	—	—	—	300, 800	P G	..	N	0.05	—	Great Britain
Trident ZWX ¹⁹	ZWX	150	—	—	300, 800	P G	..	X	0.40	—	Italy
Trieste ¹⁷	IVI	190	—	—	300, 800	P G	..	X	0.40	—	Italy
Tri Mountain ¹⁰³	KOQF	—	—	—	300, 600	P G	..	X	0.40	—	United States of America
Trinaeria	IGC	—	—	—	—	—	..	—	—	—	Italy
Trinculo ¹⁹	ENM	160	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Tring	GFIT	—	—	—	—	P G	..	N	0.30	3.00	Great Britain
Trini ¹	HNL	150	—	—	300, 600	P G	..	N	—	—	Spain
Trinidad	GERV	—	—	—	—	P G	..	—	—	—	Great Britain
Trinidadian ¹⁰³	KNO	200	—	—	300, 600	P G	..	N	0.40	—	United States of America
Trinite-Shillemans	FALS	—	—	—	600, 800	P G	..	N	0.05	—	France
Trinity ⁸⁹	NUGX	—	—	—	300, 600	P G	..	N	0.20 ¹¹¹	—	United States of America
Trinity KDBI	KDBI	—	—	—	300, 600	P G	..	N	0.40 ¹¹²	—	United States of America
Tripp ¹⁰³	KIMC	—	—	—	300, 600	P G	..	N	0.40	—	United States of America
Trippe ⁹⁹	NUQ	—	—	—	—	—	..	—	—	—	Italy
Tripoli	IKV	—	—	—	600	O ¹⁹	..	—	—	—	Holland
Triton	PAT	—	—	—	300, 600	P G	..	X	0.40	4.00	Holland
Triton	IXL	150	—	—	—	P G	..	—	—	—	Argentina Republic
Triton LQO ¹	LQO	135	—	—	300, 600	P G	..	N	0.40	4.00	Argentina Republic
Triton OVP ¹	OVP	—	—	—	—	O ³	..	X	—	—	Denmark
Tritonia ¹⁹	ZNP	150	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Triumph ¹⁰³	KEND	300	—	—	300, 450, 600	P G	..	X	0.40	—	United States of America
Trivia ¹⁹	GRK	—	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trods	LAO	—	—	—	—	O	..	X	0.40	—	Norway
Troilus ⁷¹	GDZB	250	—	—	300, 450, 600	P G	..	X	0.40	4.00	Great Britain
Troja ¹	AOAM	100-125	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Trojan	GERW	—	—	—	—	P G	..	X	0.40	—	Norway
Trojan Prince ¹⁹	XLS	150	—	—	300, 600	P G	..	X	0.40	—	Great Britain
Troll	LAJ	—	—	—	—	O	..	—	—	—	Norway
Trollholm ¹	SLJ	250	—	—	300, 600	P	..	—	—	—	Sweden

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radiogram.	
Trompenberg ¹	PZF	200	Stoomboot Maatschappij Hillegersberg, Amsterdam	300, 600	P G	X	0.40	4.00	Holland
Tromdhiensford ¹	TTI	150-200	(Armateurs) Den Norske Amerikalinje, A/S Christiania	300, 600	P G	X	0.40	4.00	Norway
Trophon ¹⁹	ERM	175	—	300, 600	P G	X	0.40	—	Great Britain
Tropic ¹⁹	GDU	—	—	300, 600	P G	X	0.40	—	Great Britain
Trosky ⁹	ZOX	150-200	—	300, 450, 600	P G	X	0.40	—	Great Britain
Troubadour ¹	TFM	—	(Armateur) Wilh. Wilhelmsen, Christiania	300, 600	P G	X	0.40	4.00	Norway
Trouper ¹⁹	FANJ	—	Navy	600, 800	P G	N	0.05	—	France
Troutpool ¹⁹	ETL	110	—	300, 600	P G	X	0.40	—	Great Britain
Troutvor ¹⁹	RCZ	150	—	600, 900	O	X	—	—	Russia
Truant	GERX	—	Navy	300, 600	P	—	0.40	—	Great Britain
Trucilla ¹	VGCW	200	Coal Harbor Wharf and Trading Company, Ltd., Vancouver, B.C.	—	P	—	—	—	Canada
Truculent ¹	GERY	—	Navy	—	P G	—	—	—	Great Britain
Truro ¹	GFIV	—	Navy	—	P G	—	—	—	Great Britain
Truro City ¹⁹	GCWS	—	Navy	300, 450, 600	P G	X	0.40	—	Great Britain
Trusty ¹⁹	GERZ	—	(Armateur) O. A. T. Skjelbred, Christiansands	300, 600	P G	X	0.40	—	Great Britain
Truth ¹	LWY	100-125	—	300, 600	P G	—	—	—	Norway
Truxton ¹⁰⁰	NUOK	—	Navy	300, 600	P G	N	—	—	United States of America
Isad ³⁵	DSM	200	—	300, 600	P G	0800 to 1200 1600 to 1900	0.40	4.00	Germany
Tsugaru ¹	ILC	—	Navy	—	O	—	—	—	Japan
Tsuruga Maru ¹	JPA	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Tsuringisan Maru	JBL	400	Mitsui Bussan Kaisha	300, 600, 1,800	P G	0800 to 1700 1400 to 1700	0.40	—	Japan
Tsurushima Maru ¹	JTV	400	Uwajima Unyu Kaisha	300, 600	P G	0800 to 2400 1400 to 1700	0.40	—	Japan
Tsushima ¹	JLO	—	Navy	—	O	—	—	—	Japan
Tsushima Maru JMA ¹	JMA	Day 400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600, 1,800	P G	0800 to 1100 1400 to 1700	0.40	—	Japan

Country	Port of Origin	Port of Destination	Company	Class	Speed (kts)	Capacity (Tons)	Frequency	Remarks
Japan	Yokohama	San Francisco	Nippon Yusen Kaisha (Japan Mail Steamship Company)	Yokohama	350	300, 600, 1,800	..	United States of America
United States of America	San Francisco	Yokohama	U.S. Shipping Board, Washington (D.C.)	San Francisco	300	300, 600	..	United States of America
Germany	Hamburg	San Francisco	U.S. Shipping Board, Washington (D.C.)	Hamburg	300	300, 600	..	Germany
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
Norway	Oslo	San Francisco	U.S. Shipping Board, Washington (D.C.)	Oslo	300	300, 600	..	Norway
United States of America	San Francisco	San Francisco	U.S. Shipping Board, Washington (D.C.)	San Francisco	300	300, 600	..	United States of America
United States of America	San Francisco	San Francisco	U.S. Shipping Board, Washington (D.C.)	San Francisco	300	300, 600	..	United States of America
United States of America	San Francisco	San Francisco	U.S. Shipping Board, Washington (D.C.)	San Francisco	300	300, 600	..	United States of America
Denmark	Copenhagen	San Francisco	U.S. Shipping Board, Washington (D.C.)	Copenhagen	300	300, 600	..	Denmark
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
France	Paris	San Francisco	U.S. Shipping Board, Washington (D.C.)	Paris	300	300, 600	..	France
Norway	Oslo	San Francisco	U.S. Shipping Board, Washington (D.C.)	Oslo	300	300, 600	..	Norway
China	Peking	San Francisco	U.S. Shipping Board, Washington (D.C.)	Peking	300	300, 600	..	China
China	Peking	San Francisco	U.S. Shipping Board, Washington (D.C.)	Peking	300	300, 600	..	China
Norway	Oslo	San Francisco	U.S. Shipping Board, Washington (D.C.)	Oslo	300	300, 600	..	Norway
United States of America	San Francisco	San Francisco	U.S. Shipping Board, Washington (D.C.)	San Francisco	300	300, 600	..	United States of America
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
Belgium	Brussels	San Francisco	U.S. Shipping Board, Washington (D.C.)	Brussels	300	300, 600	..	Belgium
Belgium	Brussels	San Francisco	U.S. Shipping Board, Washington (D.C.)	Brussels	300	300, 600	..	Belgium
Lettonia	Riga	San Francisco	U.S. Shipping Board, Washington (D.C.)	Riga	300	300, 600	..	Lettonia
Italy	Rome	San Francisco	U.S. Shipping Board, Washington (D.C.)	Rome	300	300, 600	..	Italy
Holland	Amsterdam	San Francisco	U.S. Shipping Board, Washington (D.C.)	Amsterdam	300	300, 600	..	Holland
Sweden	Stockholm	San Francisco	U.S. Shipping Board, Washington (D.C.)	Stockholm	300	300, 600	..	Sweden
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
Great Britain	London	San Francisco	U.S. Shipping Board, Washington (D.C.)	London	300	300, 600	..	Great Britain
France	Paris	San Francisco	U.S. Shipping Board, Washington (D.C.)	Paris	300	300, 600	..	France

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum, per Radiogram.	
Turia ¹	..	250	Compania Transmediterranea, Barcelona	300, 600	P G	N	0.30	3.00	Spain
Turin ¹⁰	..	100-150	Association Maritime Belge, Antwerp	300, 600	P G	X	0.40	4.00	Belgium
Turkistan ¹⁰	..	150	..	300, 600	P G	X	0.40	—	Great Britain
Turkey ¹⁰	..	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Turkheim ¹	..	180	Société les Armateurs Français, 6, Rue Vignon, Paris	300, 450, 600	P G	X	0.40	—	France
Turkistan ¹⁰	..	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Turner ²⁰	..	200	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Turpin ³⁵	..	—	..	300, 600	P G	X	0.40	—	Germany
Turquoise	..	200	Navy	—	P G	—	—	—	Great Britain
Turret Cape ²¹	..	250	Dominion Iron & Steel Co. ..	300, 600, 800	P	— ²⁷	—	—	Canada
Turret Crown ²	..	200	S.P. & W.J. Heriose, London, E.C.	300, 600	P	— ²⁷	—	—	Canada
Turrialba ²⁵	..	300	United Fruit S.S. Corpn.	300, 600	P G	N	0.40	—	United States of America
Tuscaloosa City ¹¹¹	..	300	U.S. Steel Products Co., 30, Church Street, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Tuscan GESJ	..	—	Navy	—	P G	—	—	—	Great Britain
Tuscan KUDC ¹⁰³	..	200	Merchants and Miners Transportation Company, Light and German St., Baltimore (M.D.)	300, 450, 600	P G	X	0.40	—	United States of America
Tuscania ⁶⁰	..	350	—	300, 450, 600	P G	X	0.40	—	Great Britain
Tuscan Prince ¹⁰	..	140	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	300, 600	P G	X	0.40	—	Great Britain
Tuscanstar ⁷¹	..	250	—	300, 450, 600	P G	X	0.40	—	Great Britain
Tuscany ¹⁰	..	180	Roma, Società di Navigazione, Rome	300, 600	P G	X	0.40	—	Great Britain
Tuscarora ¹⁰	..	200	Esercizio Navigazione di Stato, Rome	300, 600	P G	X	0.40	—	Great Britain
Tuscolo ¹⁷	..	140	U.S. Shipping Board Government Ship ..	300, 600	P G	X	0.40	—	Italy
Tusculum ¹⁷	..	190	—	300, 600	P G	X	0.40	—	Italy
Tustem	..	—	U.S. Shipping Board Government Ship ..	300, 600	P G	X	—	—	United States of America
Tutaneke ¹	..	335	—	300, 600	P G	X	—	—	New Zealand
Tuxpanoil ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America

Twickenham ¹⁹	150	EWS	Navy	300, 600	PG	X	0.40	Great Britain
Twigs ²⁰	—	NEPV	—	300, 600	PG	N	0.20 111 0.40 112	United States of America
Tydenan	60	PLD	Navy	300, 600	O ³⁹	—	—	Dutch East Indies
Tydeus ²¹	240	ZJM	Operated by A. Holt & Co., Managers, Liverpool	—	PG	X	0.40	Great Britain
Tyce ²	120	WPC	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	United States of America
Tymeric ¹⁹	160	GBYX	Operated by A. Holt & Co., Managers, Liverpool	300, 600	PG	X	0.40	Great Britain
Tyndareus ²¹	160	ZKC	—	300, 600	PG	X	0.40	Great Britain
Tyne ¹⁹	170	GAM	—	300, 600	PG	N	0.40	Great Britain
Tynedale ¹⁹	—	GDRB	—	300, 600	PG	X	0.40	Great Britain
Tyne Maru ¹	400	JTI	Kawasaki Zosenjo	300, 600	PG	X	0.40	Japan
Tynemouth ¹⁹	100	EYX	—	300, 450, 600	PG	—	1.00 ⁸⁷	Great Britain
Tynwald ¹⁹	—	GFPW	Société Maritime Nationale, 5 Rue Boudreau, Paris	300, 600	PG	N	0.10 ⁸⁷	Great Britain
Typhon ¹	150	UHP	—	300, 600	PG	X	0.40	France
Typhoon ¹⁹	—	BMN	Navy	300, 450, 600	PG	X	0.40	Great Britain
Tyran ¹⁹	—	GESK	—	300, 600	PG	N	—	Great Britain
Tyria ¹⁹	175	ZZW	—	300, 600	PG	N	0.40	Great Britain
Tyrian GESL	—	GESL	—	300, 600	PG	—	—	Great Britain
Tyrian VDK ²	150	VDK	—	300, 600	O	X	—	Canada
Tyrisford ¹	150 200	LCF	—	300, 600	PG	X	0.40	Norway
Tyrrhenia ⁴⁰	350	GJCB	—	300, 450, 600	PG	N	0.40	Great Britain
Tysla ¹	150 250	LFF	(Armateurs) Den Norske Afrika-og Australielinje (Wilh. Wilhelmsen), Tonsberg	300, 600	PG	X	0.40	Norway
Ubbergen ¹	150	PYF	Zuid Hollandsche Scheepvaart Maatschappij, Rotterdam	300, 600	PG	X	0.40	Holland
Uberaba ²	400	SSZ	Lloyd Brazileiro, Rio de Janeiro...	300, 600	PG	N	0.40	Brazil
Ueber ¹⁰	100-150	OOU	Lloyd Royal Belge (Antwerp)	300, 600	PG	N	0.40	Belgium
Ucayal ⁵¹	250	OCU	Cia Peruana Vap y Dique Del Callao	300, 600	PG	X	0.40	Peru
Ufie ⁴⁰	200	OGU	Aktieselskabet Det Forenede Dampskibsselskab, Copenhagen	300, 450 600, 800	PG	X	0.40	Denmark
Ugo Bassi ¹⁷	190	IUW	Esercizio Navigazione di Stato, Rome	300, 600	PG	X	0.40	Italy
Uji ¹	—	IWF	Navy	300, 600	O	—	—	Japan
Ujina Maru ¹	150	IDCA	Kyudo Gyogyo Kaisha	300, 600	P ³⁵	X	—	Japan
Ula GOL ¹⁸	160	GOL	—	300, 600	PG	X	0.40	Great Britain
Ula LCV ¹⁸	300	LCV	(Armateurs) A/S Norsk Bjernings- compagni, Christiania	300, 450, 600	PG	X	—	Norway
Ulidia ¹⁹	130	BGP	—	300, 600	PG	X	0.40	Great Britain
Ulimaroa ¹	250	WHY	—	300, 600	PG	—	0.20 ⁸ 0.40 ⁸	Australian Commonwealth

(Ship's time)

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Per- formed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Mini- mum per Radio- tele- gram.	
Ulla ¹	SDJ	250	Aktiebolaget Transmarin, Helsing- borg	300, 600	P	0700 to 0730 1200 to 1230 2000 X	0.40	4.00	Sweden
Ullstad ¹	LCW	100-150	(Armateur) Bendix J. Grefstad, Arendal	300, 600	P G		0.40	4.00	Norway
Ulm ¹	FWP	300	Huret et Sauvage, Place de Capé- cure, Boulogne-sur-Mer	300, 600	P G	X	0.40	—	France
Ullster GESM	GESM	—	—	—	P G	—	—	—	—
Ullster MCW ¹⁰	MCW	175	—	300, 600	P G	N	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Ulua ¹¹	BOE	500	State St., Boston, Mass. Operated by A. Holt & Co., Managers, Liverpool	300, 600	P G	N	0.40	—	Great Britain
Ulysses GBU ¹¹	GBU	280	Panama R.R. Co., 24, State St., New York (N.Y.)	300, 600	P G	X	.40	—	Great Britain
Ulysses KPU ¹²	KPU	300	Koninklijke Nederlandsche Neder- land Stoomboot, Maatschappij, Amsterdam	300, 600	P G	N	.40	—	United States of America
Ulysses ¹	PVY	150	Societa Italiana di Servizi Marit- timi, Rome	300, 600	P G	X	.40	4.00	Holland
Umbria ¹²	ITU	190	Sot-y-Aznar, Bilbao	300, 600	P G	X	0.40	—	Italy
Umbe-Mendi ¹	HMV	250	Taiyo Kaun Kaisha	300, 600	P G	N	0.30	3.00	Spain
Ume Maru ¹	JEW	400	—	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Unfuli ¹¹	GFYW	125	Bullard, King & Co., Ltd.	300, 450, 600	P G	X	0.40	—	Great Britain
Umkuzi ¹¹	GCXN	125	Bullard, King & Co., Ltd.	300, 450, 600	P G	X	0.40	—	Great Britain
Umlazi ¹¹	CCXB	—	Bullard, King & Co., Ltd.	300, 450, 600	P G	X	0.40	—	Great Britain
Umona ¹¹	BLW	—	Bullard, King & Co., 14, St. Mary Axe, London, E.C. 3	300, 600	P G	X	0.40	—	Great Britain
Umpire	GESN	—	Navy	—	P G	—	—	—	—
Umpequa ¹³	NATS	—	Navy	—	P G	—	—	—	—
Unsinga ¹¹	GDBF	125	Bullard, King & Co.	300, 450, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	Great Britain
Umta ¹⁹	GON	170	—	300, 600	P G	X	0.40	—	Great Britain
Umtali ¹⁹	ERI	200	Bullard, King & Co.	300, 600	P G	X	0.40	—	Great Britain
Umtata ¹⁹	GCDF	—	Bullard, King & Co.	300, 600	P G	X	0.40	—	Great Britain
Umvolosi ¹¹	GCWT	125	Bullard, King & Co.	300, 450, 600	P G	X	0.40	—	Great Britain
Umvuma ¹⁹	ZOR	180	Bullard, King & Co.	300, 600	P G	X	0.40	—	Great Britain
Umozinto ¹⁹	ERF	—	Bullard, King & Co.	300, 450, 600	P G	X	0.40	—	Great Britain

[illegible]

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Uralkar ¹ ..	TOU	150	Urquijo y Aldecoa, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Ural San Maru ¹ ..	JMS	400	Yamaichi Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Uranus ¹ ..	FBU	250	Louis Dero, Quai Delavigne, Le Havre	300, 600	P G ..	X	0.40	—	France
Urbino ¹⁹ ..	GBWP	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Urchin ..	GESQ	—	Navy ..	—	P G ..	—	—	—	Great Britain
Urbie ..	CBE	—	Navy ..	—	—	—	—	—	Chile
Uribarte ¹ ..	TOW	200	Compania Vasco Cantábrica de Navegacion, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Urilla ¹ ..	VZU	300	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
Urkiola-Mendi ¹ ..	HMX	200	Sota y Aznar, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Urko-Mendi ¹ ..	HMY	200	Sota y Aznar, Bilbao	300, 600	P G ..	N	0.30	3.00	Spain
Urtibia ¹⁹ ..	GOP	180	—	300, 600	P G ..	X	0.40	—	Great Britain
Urruppu Maru ¹ ..	JAJA	200	Noshomusho (Ministry of Agriculture and Commerce)	300, 600	O ..	X	—	—	Japan
Ursa ..	GESR	—	Navy ..	—	P G ..	—	—	—	Great Britain
Ursula ¹⁴ ..	GEST	—	Navy ..	—	P G ..	—	—	—	Great Britain
Ursus ¹ ..	ULU	180	Compagnie Générale Transatlantique, 6, Rue Aubert, Paris	300, 450, 600	P G ..	X	0.40	—	France
Ursus YVR ¹⁰ ..	YYR	130	(Armateur) John K. Haaland, Haugesund	300, 600	P G ..	X	0.40	—	Great Britain
Urter ¹ ..	LEA	100-150	Cia. Peruana Vap y Dique Del Callao	300, 600	P G ..	X	0.40	4.00	Norway
Urubaiba ⁵¹ ..	OCR	250	Navy ..	300, 600	P G ..	X	0.40	—	Peru
Uruguay CWD ..	CWD	220	Navy ..	450, 700	O ..	—	—	—	Uruguay
Uruguay LMD ¹ ..	LMD	—	Navy ..	450, 600	O ..	N	—	—	Argentina Republic
Uruguayo (EI) ¹⁹ ..	GCSQ	250	—	300, 600	P G ..	X	0.40	—	Great Britain
Urundi ²⁸ ..	DUI	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Usarano ²⁵ ..	DUS	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Usedom ²⁵ ..	DUS	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Uskmouth ⁷ ..	GCWV	100	Siemens Bros. & Co., Ltd., Wool.	300, 450, 600	P G ..	X	0.40	4.00	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Vaidura ¹⁸	YPT	180	—	300, 600	PG	X	0.40	—	Great Britain
Valenore ¹⁹	XKW	150	—	300, 600	PG	X	0.40	—	Great Britain
Valencia ¹	CMX	100	—	300, 600	PG	N	0.30	3.00	Spain
Valentin ¹	TKV	100	Compania Espanola de Navegacion, Valencia	300, 600	PG	N	0.30	3.00	Spain
Valentine	GESW	—	Wenceslao Gonzalez, Garra	—	PG	—	—	—	Great Britain
Valerian ¹	GFIW	—	Navy	—	PG	—	—	—	Great Britain
Valette (La) ¹⁹	BDU	—	—	300, 600	PG	X	0.40	—	Great Britain
Valeureux (Le) ¹	UAU	150	R. Petit, 27, Quai de l'Arriere Port, Dieppe	300, 600	PG	X	0.40	—	France
Vallalla	GESV	—	Navy	—	PG	—	—	—	Great Britain
Valiant GCPV ¹⁹	GCPV	150	Navy	300, 600	PG	X	0.40	—	Great Britain
Valient GECS	GESG	—	Scheepvaart Maatschappij Zuid-Holland, Rotterdam	300, 600	PG	X	—	—	Great Britain
Valkenburg ¹	PIG	200	Navy	—	PG	—	0.40	4.00	Holland
Valkyrie	GESX	—	Navy	—	PG	—	—	—	Great Britain
Valkyrien LAK	LAK	—	Navy	600	O ¹⁹	—	—	—	Norway
Valkyrien OUV ¹	OUV	—	Navy	300, 600	O ¹⁹	X	—	—	Denmark
Valkyrien ¹	OXY	100	Aktieselskabet Em. Z. Svitzer's Bjerg-Enterprise, Copenhagen	—	P	X	0.40	4.00	Denmark
Vallarsa ¹⁷	IUO	190	Lloyd del Mediterraneo Societa di Navigazione, Rome	300, 600	PG	X	—	—	Italy
Valle (El) ²	KKW	200	Southern Pacific Co., Pier 49, North River, New York (N.Y.)	300, 600	PG	X	0.40 ¹¹	—	United States of America
Valette (La) ¹⁹	NUJT	—	Navy	300, 600	PG	N	0.20 ¹¹	—	United States of America
Valmurian ¹	TKW	150	Compania Naviera Valmurian, Barcelona	300, 600	PG	N	0.40 ¹¹	—	Spain
Valorous	GESY	—	Navy	—	PG	—	0.30	3.00	Great Britain
Valparaiso ¹	SGW	350	Rederiaktiebolaget Nordstjernan (Johnson Line), Stockholm, Sweden and Norway-Brazil-Uruguay-Argentine and West Coast of South and North America Line	300, 600	P	—	0.28	2.80	Sweden
Vatameri ¹	OJP	250	Carlos Latorre, Bilbao	300, 600	PG	X	0.15	0.75	Finland
Valerite ²	ECD	150	Navy	—	PG	N	0.30	3.00	Spain
Valnola	AZW	—	Navy	—	O	—	—	—	Estonia
Vampire	GESZ	—	Navy	—	PG	—	—	—	Great Britain
Vindat ¹⁹	KOBF	300	United States Transport Co., 50, Broad St., New York (N.Y.)	300, 450, 600	PG	N	0.20	—	United States of America

Van Camp No. 11. ⁸⁷	KDAK	150	Fish Cannery's Company	300, 600	P G	X	0.20	United States of America
Van Cloon 144	PMJ	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Vancouver ERY 10	ERY	180	—	300, 600	P G	X	—	Great Britain
Vancouver GETB	GETB	—	Navy	—	P G	—	—	Great Britain
Vancouver HTG 1	HTG	200	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	France
Vancouver Maru 1	JIZ	500	Kokusai Kisen Kaisha	300, 600	P G	—	0.40	Japan
Van der Hagen 1	PMN	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Doorn	PLE	60	Navy	300, 600	O 30	X	—	Dutch East Indies
Vandyck 19	GFNC	—	—	300, 600	P G	—	0.40	Great Britain
Vanelhus 19	GDVW	125	—	2,100, 2,200	P G	X	0.10 87	Great Britain
Vanessa	GETC	—	Navy	300, 600	P G	—	—	Great Britain
Van Gogh	APB	60	Navy	300, 600	O 30	—	—	Denmark
Van Heemskerk 1	PKS	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Imhoff 1	PMU	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Vanity	GETD	—	Navy	—	P G	—	—	Great Britain
Van Linschoten 1	PMT	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Meerlant	PBC	—	Navy	600	O 4	—	—	Holland
Vanneau	CNV	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Morocco
Van Neck 1	PKR	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Noort 1	ANW	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Vanoc	GETF	—	Navy	—	P G	—	—	Great Britain
Van Outhoorn 1	PKQ	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Overstraten 1	PME	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Vanquisher	GETJ	—	Navy	—	P G	—	—	Great Britain
Van Rees 1	PMV	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Rensselaer	PEQ	250	Koninklijke West Indische Maatschappij, Amsterdam	300, 600	P G	—	0.40	Holland
Van Riemsdyk 1	AOD	200	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Vansittart	GETK	—	Navy	—	P G	—	—	Great Britain
Van Spilbergen 1	PMM	150	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Swoll 1	ANT	150	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies
Van Waerwyck 1	PKT	250	Koninklijke Paketvaart Maatschappij, Amsterdam	300, 600	P G	—	0.40	Dutch East Indies

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Var	FATZ	—	Navy	600, 800	P/G	N	0.05	—	France
Vardulia ¹⁰	YXS	140	—	300, 600	P/G	N	0.40	—	Great Britain
Varela ¹⁹	MSR	220	—	300, 600	P/G	X	0.40	—	Great Britain
Varese	IHY	—	Navy	—	—	—	—	—	Italy
Varna ¹	SIJ	250	Rederaktiebolaget Sverige-Lavanten, Gothenburg	300, 600	P	0800 to 0830 1200 to 1230 2000 to 2030 (local mean time)	0.40	4.00	Sweden
Varsova ¹⁹	ZGN	240	Director, India Office Shipping, 5, Bishopsgate, London, E.C. 2	300, 600	P/G	P/G	0.40	—	Great Britain
Varzin ⁷¹	XIR	180	—	300, 600	P/G	X	0.40	—	Great Britain
Vasari ¹⁹	GBZL	—	—	300, 600, 2,100 2,600 C.W.	P/G	N	0.40	—	Great Britain
Vasco ¹⁹	GBYK	—	—	300, 600	P/G	X	0.40	—	Great Britain
Vasco da Gama	CTB	100-150	Navy	300, 600	O	—	—	—	Portugal
Vasconia ¹⁹	ENA	150	—	300, 600	P/G	N	0.40	—	Great Britain
Vasco Nunez de Balbao	CLO	—	Navy	300, 600	O	—	—	—	Spain
Vasna ¹⁹	ZHE	220	—	300, 600	P/G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	Great Britain
Vassilios Destounis ¹	SWOS	100-150	Destounis Bros., Athens	300, 600	P/G	—	0.40	4.00	Greece
Vaterland ²⁸	DVD	200	—	300, 600	P/G	X	0.40	4.00	Germany
Vauban FOX ¹	FOX	180	René Maillaillarcq & Cie., La Rochelle	300, 600	P/G	X	0.40	—	France
Vauban MJW ¹⁹	MJW	250	—	300, 600, 2,100 2,200 C.W.	P/G	N	0.40	—	Great Britain
Vaulcin ¹	ULK	200	Compagnie Générale Transatlantique, Paris	300, 450, 600	P/G	X	0.40	—	France
Vauchse FAVC	FAVC	—	British Dominion Holding and Investment Co., Ltd., 204, Dominion Express Building, Montreal (P.Q.)	300, 800	P/G	N	0.03	—	France
Vaudreuil ²	XVY	150	Navy	300, 600	P	— ²⁷	0.40	—	Canada
Vauquois	FBVQ	—	Houtvaart, Rotterdam	300, 800	P/G	N	0.05	—	France
Vaux ¹⁹	GDNL	120	Solleveld, Van der Meer en T. H. van Hattums, Stoomvaart Maatschappij	300, 600	P/G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
Vecht ¹	IZR	150	—	300, 600	P/G	X	0.40	4.00	Holland
Veehtdijk HDR ¹	HDR	200	—	300, 600	P/G	X	0.40	4.00	Holland

Vechtdijk TVG ¹ ..	TVG	200	Nederlandsche - Amerikaansche Stoomvaart, Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450 600, 800	P G	X	0.40	4.00	Flouide
Vectis	GETL	—	Navy	—	P G	—	—	—	Great Britain
Vedamore ¹⁹	OEL	—	Navy	300, 450, 600	P G	—	0.40	—	Great Britain
Vedetta Italiana	LAAC	—	Navy	600, 800	P G	—	0.05	—	France
Vedette ³⁴	FAQK	—	Navy	600, 800	P G	—	0.05	—	France
Vedette 62	FAQP	—	Navy	600, 800	P G	—	0.05	—	France
Vedette 64	FAQW	—	Navy	600, 800	P G	—	0.05	—	France
Vedette 70	FAQY	—	Navy	300, 600	P G	—	0.40	—	Great Britain
Vedic ¹⁹	ZNG	160	Navy	300, 450	P G	—	0.40	4.00	Holland
Veenam ³⁵	HDY	350	Navy	600, 800	P G	—	0.40	—	Holland
Vendijk ¹ ..	PIR	150	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Hol- land-Amerika Lijn, Rotterdam	300, 450 600, 800	P G	—	0.40	4.00	Holland
Veerhaven ¹	TYJ	150	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Hol- land-Amerika Lijn, Rotterdam	300, 450, 600	P G	—	0.40	—	France
Vega FVY ¹	FVY	—	Joseph Huret, Boulogne-sur-Mer	—	P G	—	0.40	—	Great Britain
Vega GETM	GETM	—	Navy	—	P G	—	—	—	United States of America
Vega NAXM ¹⁰²	NAXM	200	Altielskabet Dampskibsselskabet	300, 600	P G	—	0.40	4.00	Denmark
Vega OHU ⁴⁰	OHU	—	Orion, Copenhagen	300, 450 600, 800	P G	—	0.40	—	United States of America
Vegas (Las) ^{9 121}	KUQM	300	U.S. Shipping Board, Washington (D.C.)	450, 600	P G	—	0.40	—	Germany
Vegasack ²⁵	DVK	200	Roma, Societa di Navigazione, Rome	300, 600	P G	—	0.40	4.00	Italy
Vejo ⁴¹	UTJ	190	(Armateurs) Det Bergens Damps- kibsselskab, Bergen	300, 600	P G	—	0.40	—	Norway
Vela ¹	LCI	100-125	Alejandro Litani, Barcelona	300, 600	P G	—	0.30	3.00	Spain
Velarde ¹	HME	100	Yacht belonging to G. Allan	300, 600	P G	—	0.20 112	—	United States of America
Velero ²	WHV	50	Hancock, 908, Merchants' National Bank Building, Los Angeles (Cal.)	300, 600	P G	—	0.40 112	—	Great Britain
Vellavia ⁷¹ ..	YYM	250	Operated by the Cunard S.S. Co., Cunard Building, Liverpool	300, 450, 600	P G	—	0.40	—	Norway
Velloy ¹	AQAP	150-175	(Armateurs) Johan Rasmussen & Alex Lange, Sandefjord	300, 600	P G	—	0.40	4.00	Greece
Velos	SYB	—	Navy	—	O	—	—	—	Great Britain
Velox	GETN	—	Navy	—	P G	—	0.15	—	Lettonia
Velta ¹	KCF	150	(Armateur) P. Daubebergs, Riga	300, 450, 600	P G	—	0.40	—	France
Vence ¹	FKK	200	Société Maritime Nationale, 5 Rue Boudreau, Paris	300, 600	P G	—	0.40	—	Great Britain
Vendetta	GETP	—	Navy	—	P G	—	0.40	—	France
Vendone ¹	UNC	200	Société Maritime Auxiliaire de Transports, Nantes	300, 600	P G	—	0.40	—	Great Britain
Venetia GETR	GETR	—	Navy	—	P G	—	—	—	United States of America
Venetia WOV ²	WOV	100	Yacht belonging to J. D. Spreckles, 90, Clay St., San Francisco (Cal.)	300, 600	P G	—	—	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs. Per Word.	Minimum per Radio-telegram.	Country.
Venetian ¹⁹	YIE	160	Lloyd Royal Belge, Antwerp	300, 600	PG	N	0.40	—	Great Britain
Venictier ¹⁰	ONW	100-150	Navy	300, 600	PG	X	0.40	4.00	Belgium
Venezuela	IHV	250	Koninklijke West-Indische	300, 450	PG	X	—	—	Italy
Venezuela Pco ¹	PEO	200	Maldenst, Amsterdam	600, 800	PG	X	0.40	4.00	Holland
Venezuela WBG ¹⁰	WBG	200	Pacific Mail S.S. Co., 508, Market St., San Francisco (Cal.)	300, 600	PG	X	0.40	—	United States of America
Veni ¹	LEN	150-200	—	300, 600	PG	X	0.40	4.00	Norway
Venice ¹⁰	OEE	130	—	300, 600	PG	X	0.40	—	Great Britain
Venice Maru ¹	JANA	400	Kawasaki Zosenjo	300, 600	PG	X	0.40	—	Japan
Veniero ¹⁷	IYA	140	Società Veneziani di Navigazione à vapore, Venice	300, 600	PG	X	0.40	—	Italy
Vennachar ¹⁹	ZHK	170	Navy	300, 600	PG	X	0.40	—	Great Britain
Venonia ¹⁹	EYI	150	Marconi Wireless Telegraph Company of Canada, Ltd.	300, 600	PG	X	0.40	—	Great Britain
Venonious ¹⁹	GETQ	150	Oceanic S.S. Co., 60, California St., San Francisco, (Cal.)	300, 600	P	X	—	—	Great Britain
Venosta ²¹	GDFT	150	—	300, 600, 1,800	PG	N	0.40	—	United States of America
Ventura ¹⁰	WHL	150	—	300, 600	PG	X	0.40	—	Great Britain
Ventura de Larrinaga ¹⁹	ELB	175	Union S.S. Co. of British Columbia, Vancouver, B.C.	300, 600	PG	X	0.40	—	Canada
Venture ²	VGX	200	Navy	300, 600	PG	X	0.40	—	Great Britain
Venturous ¹⁹	GETS	200	Société les Affreteurs Réunis, Paris	300, 600	PG	X	—	—	Great Britain
Venus DIV ³³	DVU	200	Ficamp	300, 600	PG	X	0.40	4.00	Germany
Venus FIV ¹	FIV	300	Société la Pêche Française,	300, 600	PG	X	0.40	—	France
Venus FPV ¹	FPV	180	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 600	PG	X	0.40	—	Holland
Venus HEP ¹	HEP	150	(Amateurs) Det Bergenske Dampskibsselskab, Bergen	300, 450, 600	PG	X	0.40	4.00	Norway
Venus LDO	LDO	Day 240 Night 480	—	—	PG	X	0.20	2.00	—

Venus LQP ¹	..	LQP	135	Nicola's Mihanovich Compania, Ltd., Buenos Aires	300, 600	P G	..	N	0.40	4.00	Argentine Republic
Venus OHY ⁴⁰	..	OHY	300	Atkieselskabet Dampskibsselskabet Orion, Copenhagen	300, 450 600, 800	P G	..	X	0.40	4.00	Denmark
Venusia ⁷¹	..	EWB	125	Operated by the Cunard S.S. Co., Ltd., Cunard Building, Liverpool	300, 450, 600	P G	..	X	0.40	—	Great Britain
Vera ¹⁹	..	YJU	155	—	300, 600	P G	..	N	0.10 ⁸²	1.00 ⁸²	Great Britain
Vera Kathleen ¹⁹	..	ZDX	120	—	300, 600	P G	..	N	0.40	—	Great Britain
Verbania ¹⁹	..	XIM	—	—	300, 600	P G	..	N	0.40	—	Great Britain
Verberna	..	GFIK	—	Navy	—	P G	..	—	—	—	France
Verdun FBVD	..	FBVD	—	Navy	300, 800	P G	..	N	0.05	—	Great Britain
Verdun GETV	..	GETV	—	Operated by the Cunard S.S. Co., Cunard Building, Liverpool	300, 600	P G	..	N	0.40	—	Great Britain
Verentia ⁷¹	..	XMG	150	Navy	—	P G	..	—	—	—	Great Britain
Verity	..	GETW	—	Compagnie Générale Transatlantique, 6, Rue Aubert, Paris	300, 600	P G	..	X	0.40	—	France
Vermont FGW ¹	..	FGW	300	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ⁷²	—	United States of America
Vermont NVK ⁸⁰	..	NVK	—	Transports Maritimes de l'Etat Administration des Chemins de fer de l'Etat, 13, Rue d'Amsterdam, Paris	300, 600	P G	..	X	0.15	—	France
Verrier ¹	..	HOJ	150	Navy	600, 800	P G	..	N	—	—	Great Britain
Versailles ¹	..	FZX	200	Navy	—	P G	..	—	—	—	France
Versatile	..	GETX	—	Navy	—	P G	..	—	—	—	Great Britain
Vesco	..	FAXM	—	Navy	—	P G	..	—	—	—	France
Vesper	..	GETY	—	Standard Transportation Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	..	X	0.40	—	United States of America
Vesta KTS ^{9, 121}	..	KTS	300	Esercizio Navigazione di Stato, Rome	300, 600	P G	..	X	0.40	—	Italy
Vesta UPW ¹⁷	..	UPW	140	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Vestal ⁹⁹	..	NMC	—	Navy	—	P G	..	—	—	—	Great Britain
Vestalia ¹⁹	..	ITV	—	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 600	P G	..	X	0.40	4.00	Holland
Vestax TXM ¹	..	TXM	150	(Armateur) Rich Amle, Haugesund	300, 600	P G	..	X	0.40	4.00	Norway
Vestland ¹	..	AQI	200	—	300, 600, 2,100 2,200 G.W.	P G	..	N	0.40	—	Great Britain
Vestris ¹⁹	..	MJZ	250	Navigazione Generale Italiana, Genoa	300, 600	P G	..	X	0.40	—	Italy
Vesuvio ¹⁷	..	IZQ	190	Navy	—	P G	..	—	—	—	Russia
Vetche	..	RBY	400	—	300, 600	P G	..	X	0.40	—	Great Britain
Vetran	..	GETZ	—	—	—	P G	..	—	—	—	Portugal
Viana ⁶¹	..	CUO	100-150	Aktieselskabet Dampskibsselskabet Dannebrog, Copenhagen	300, 450, 600, 800	P G	..	N	0.40	4.00	Denmark
Wiborg ⁴⁰	..	OHA	300	Compania Trasmediterranea, Barcelona	300, 600	P G	..	N	0.30	3.00	Spain
Vicente Ferrer ²	..	EEF	100	Navy	300, 450, 600	O	..	N	—	—	Argentine Republic
Vicente Fidel Lopez ¹	..	LLX	80	Compania Trasmediterrania, Barcelona	300, 600	P G	..	N	0.30	3.00	Spain
Vicente La Roda ²	..	EER	180	Compania Trasmediterrania, Barcelona	300, 600	P G	..	N	0.30	3.00	Spain
Vicente Puchol ²	..	FEP	180	Compania Trasmediterrania, Barcelona	300, 600	P G	..	N	0.30	3.00	Spain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Viceroy Victoria ¹	GEVB SMX	— 150	Navy Federaktiebolaget Svenska Lloyd, Gothenburg	— 300, 600	P G P	— 0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	— 0.40	— 4.00	Great Britain Sweden
Vicksburg Vicksburg	KBSC WYDE	— 350	Charles Ward Engineering Works	— 450, 600	O	X	—	—	United States of America
Victrolite ²¹ Victor Chavarri ¹	VGLK CMG	150 150	Imperial Oil Ltd., Toronto, Ontario Alfos, H. Ornos, de Vizcaya, Bilbao	900, 1100 300, 600, 800 300, 600	P P G	— N	— 0.40	— 3.00	United States of America Canada Spain
Victor Hugo Victor-Revelle	FAVH FALZ	— —	Navy Navy	300, 800 600, 800	P G P G	N N	0.05 0.05	— —	France France
Victoire III. Victoire HQW ¹	FABM HQW	— 200	Transports Maritimes de l'Etat	300, 800 300, 600	P G P G	N X	0.05 0.40	— —	France France
Victoria GUP ²¹ Victoria GVB Victoria Maru ¹	GUP GVB JIS	50 400	South Eastern & Chatham Rly. Hawasaki Josenjo	300, 600 300, 600	P G P G	N —	0.10 ⁸² 0.40	1.00 ⁸² —	Great Britain Hong Kong Japan
Victoria MWD ¹⁹ Victoria STW ¹⁵ Victoria VHX ¹	MWD STW VHX	240 100 250	Pacific Steam Navigation Co. Companhia Lloyd Nacional, Rio de Janeiro	300, 600 300, 600 300, 600	P G P G P G	0800 to 1100 1400 to 1700 2000 to 2400 N X	0.40 0.40 0.40	— — —	Great Britain Brazil Australian Commonwealth
Victoria WAD ⁹⁷	WAD	100	Alaska S.S. Co., 1107, Colman Building, Seattle (Wash.)	300, 450 525, 600	P G	N	0.20	—	United States of America
Victoria and Albert Victorian ¹⁹ Victorian Transport ¹⁰ Victorious ¹⁰³	GFUR MVN XEN WXIA	— 200 140 300	U.S. Shipping Board, Washington (D.C.)	300, 600 300, 600 300, 450, 600	P G P G P G	N X X	— 0.40 0.40	— — —	Great Britain Great Britain Great Britain United States of America
Vidar Vidar OHJ ⁴⁰	SCD OHJ	— 200	Navy Aktieselskabet det Forenede Damp- skibsselskab, Copenhagen	— 300, 450 600, 800	O ³⁹ P G	X	— 0.40	— 4.00	Sweden Denmark

V. dar SLC	SLC	250	Stockholms Svea, Stockholm	Rederiaktiebolag	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.40	4.00	Sweden
Vidette	GEVC	—	Navy	.. .. .	—	P G	—	—	—	Great Britain
Vidhet Kichkara	HGT	—	Navy	.. .. .	300, 600	O	—	—	—	Spain
Vienna	IAB	190	Lloyd Triestino, Società di Navigazione a Vapore, Trieste	.. .. .	300, 600	P G	0.40	—	—	Italy
Viente de Mayo	PWN	—	Navy	.. .. .	—	—	—	—	—	Cuba
Viente y Cuatro de Febrero	PWO	—	Navy	.. .. .	—	—	—	—	—	Cuba
Vigilant	KOZP	150	E. K. Wood Lumber Co., 112, Market Street, San Francisco (Cal.)	.. .. .	300, 450, 600	P G	0.20 111	0.40 112	—	United States of America
Vigo DVG ²⁵	DVG	200	—	.. .. .	300, 450, 600	P G	—	—	—	Germany
Vigo ZVT ¹⁹	ZVT	160	—	.. .. .	300, 600	P G	0.40	—	—	Great Britain
Vigoreux	FAVX	—	Navy	.. .. .	300, 800	P G	0.05	—	—	France
Viking ⁴⁰	—	—	Aktieselskabet Det Forenede Dampskib-Selskab, Copenhagen	.. .. .	—	—	—	—	—	Denmark
Viking KDYC ²	KDYC	150	George E. Billings	.. .. .	300, 450, 600	P G	0.40	—	—	United States of America
Viking LAF	LAF	—	Navy	.. .. .	—	O	—	—	—	Norway
Viking MCD ²¹	MCD	140	Amazon Telegraph Co., Ltd.	.. .. .	300, 600	P	—	—	—	Great Britain
Viking MVQ ¹⁰	MVQ	—	Isle of Man Steam Packet Co., Ltd.	.. .. .	300, 600	P G	0.10 87	1.00 87	—	Great Britain
Viking OZH ¹	OZH	160	Aktieselskabet Em. Z. Svitzers Bjerg-Enterprise, Copenhagen	.. .. .	300, 450, 600	P	0.40	—	—	Denmark
Viking TSS ¹	TSS	100-150	(Armateur) M. Clausen, Haugesund Njld Coustal	.. .. .	300, 600	P G	0.40	—	—	Norway
Viking VYC	VYC	—	—	.. .. .	—	—	—	—	—	Newfoundland
Vikingstar ²¹	GDLT	250	Siemens Bros. & Co., Ltd., Woolwich, London, S.E. 18	.. .. .	300, 450, 600	P G	0.40	—	—	Great Britain
Villaamil	EBP	140	Navy	.. .. .	—	O	—	—	—	Spain
Villafranca ¹	TKZ	150	Sociedad Anonima Naviera Española, Barcelona	.. .. .	300, 600	P G	0.30	—	—	Spain
Villagarcia DVI ²⁵	DVI	200	Hijos de Francisco Deza Santiago (Coruna)	.. .. .	300, 450, 600	P G	0.40	—	—	Germany
Villagarcia EFV ¹	EFV	150	Navy	.. .. .	300, 600	P G	0.20 111	—	—	United States of America
Villalobos ⁴⁰	NVP	—	Gutierrez Hermanos, Bilbao	.. .. .	—	P G	0.40 112	—	—	Spain
Villamanrique ¹	HNF	150	Jose Zarauz Villalobrid	.. .. .	300, 600	P G	0.30	—	—	Spain
Villaozrid ¹	CXV	100	Compania Transmediterranea, Barcelona	.. .. .	300, 600	P G	0.30	—	—	Spain
Villareal ²	EEW	180	Navy	.. .. .	—	—	—	—	—	Cuba
Villas	PWQ	—	Compania Naviera Gascuna, Bilbao	.. .. .	300, 600	P G	0.30	—	—	Spain
Villasindino ¹	HNG	150	Compagnie Générale Transatlantique, Paris	.. .. .	300, 600	P G	0.10	—	—	France
Ville de Bône ^{53 1}	FGB	180	Compagnie Havraise Peninsulaire de Navigation à Vapeur, 10, Rue de Phalsbourg, Le Havre	.. .. .	300, 600	P G	0.40	—	—	France
Ville de Djibouti ¹	FLW	200	—	.. .. .	—	—	—	—	—	—

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service formed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Ville de Liege ¹ ..	OPL	100-150	Government	300, 600	PG ..	N ¹⁸	0.40 ¹¹	4.00 ¹³	Belgium
Ville de Madrid ^{1 59} ..	FGM	150	Compagnie Générale Transatlantique, Paris	300, 600	PG ..	— ³⁷	0.10	—	France
Ville de Majunga ¹ ..	FLI	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Marseille ¹ ..	FLS	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Mazagan ¹ ..	UGU	200	Société Maritime Française, 5 Boulevard Malesherbes, Paris	300, 600	PG ..	X	0.20	—	France
Ville de Metz ¹ ..	FLB	300	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Nantes ^{1 55} ..	FGL	200	Compagnie Générale Transatlantique, Paris	300, 600	PG ..	X	0.10	—	France
Ville de Paris ¹ ..	FLP	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Rheims ¹ ..	FLM	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Rouen ¹ ..	FLL	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Strasbourg ¹ ..	FLF	300	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville de Tâmatave ¹ ..	FLQ	300	D. Quartier, 60 Quai Gaston Boulet, Rouen	300, 600	PG ..	X	0.40	—	France
Ville de Tunis ..	FGT	200	Compagnie Générale Transatlantique, Paris	300, 600	PG ..	X	0.10	—	France
Ville de Verdun ..	FLV	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville d'Anvers ¹ ..	OTA	100-150	Government	300, 600	O ..	N	—	—	Belgium
Ville d'Arras ¹ ..	FLR	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville d'Oran FGT ^{55 1} ..	FGZ	200	Compagnie Générale Transatlantique, Paris	300, 600	PG ..	X	0.10	—	France
Ville d'Oran FLO ¹ ..	FLO	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville du Havre ¹ ..	FLA	200	Compagnie Havraise Péninsulaire de Navigation à Vapeur	300, 600	PG ..	X	0.40	—	France
Ville d'Ys ..	FBVY	—	Navy	300, 800	PG ..	N	0.05	—	France
Willeneuve ¹ ..	FKJ	200	Société Maritime Nationale, 5 Rue Boudreau, Paris	300, 600	PG ..	X	0.40	—	France

Viniera	GEVD	—	Navy	600, 800	P G	—	—	—	France
Vimy FANG	FANG	—	Navy	300, 600	P G	0.05	—	—	France
Vimy HSI	HSI	150	Société Dupuis d'Armement à la Pêche, Dieppe	300, 600	P G	0.40	—	—	United States of America
Vincennes Bridge ¹⁰³	KOXM	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	0.40	—	—	United States of America
Vincent ⁹⁷	KIZS	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	0.20	—	—	Canada
Vincent A. White ²	VGCN	—	Charles Mitchell Wickens, Shag Harbor, N.S.	—	P ¹⁸	—	—	—	Italy
Vincenzo Florio ¹⁷	INYN	140	Florio V. & L., Rome	300, 600	P G	0.40	—	—	Norway
Vindegen ¹	AWO	300	(Armateurs) Jens. Folkmans, Rederi, A/S Skien	300, 600	P G	0.40	—	—	Great Britain
Vindelia ¹⁹	MXD	150	—	600	O ³	—	—	—	Denmark
Vindhunden ¹	OVV	—	Navy	—	P G	—	—	—	Great Britain
Vindictive ^{..}	GEKB	—	Navy	—	P	—	—	—	Sweden
Vinga ¹	SIF	150	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P	0.40	—	—	—
Vinh-Long	FAVL	—	Navy	300, 800	P G	0.05	—	—	France
Vinita ^{9 131}	KOTIL	200	U.S. Shipping Board, Washington (D.C.)	450, 600	P G	0.40	—	—	United States of America
Vinland ¹	OXF	200	Aktieselskabet Dansk-Amerikansk Dampskibsselskab, Copenhagen	300, 450, 600	P G	— ³⁸	—	—	Denmark
Vinstra ¹	LFE	150-250	(Armateurs) Den Norske Afrika-og Australielinie (Wilh. Wilhelm-sen) Tonsberg	300, 600	P G	0.40	—	—	Norway
Violent	GEVF	—	Navy	—	P G	—	—	—	Great Britain
Viroco ⁹⁹	NIKL	—	Navy	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	—	—	United States of America
Virgil ¹⁰	ZOI	200	Operated by the Cunard S.S. Co., Cunard Building, Liverpool	300, 600	P G	0.40	—	—	Great Britain
Virgilia ¹⁹	GXB	150	—	300, 600	P G	0.40	—	—	Great Britain
Virginia KUV ¹⁰³	KUV	300	Texas Co., Port Arthur (Texas)	300, 600	P G	0.40	—	—	United States of America
Virginia IWT ¹⁷	IWT	140	Lloyd del Mediterraneo, Societa di Navigazione, Rome	300, 600	P G	0.40	—	—	Italy
Virginia NVR ⁹⁸	NVR	—	Navy	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	—	—	United States of America
Virginia OIS ⁴⁰	OIS	250	Aktieselskabet Det Forenede Dampskibsselskab, Copenhagen	300, 450 600, 800	P G	0.40	—	—	Denmark
Virginia Bridge ¹⁰³	KUCF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0.40	—	—	United States of America
Virginia Limited ^{9 131}	WFL	300	Richmond-New York S.S. Co.,	300, 450, 600	P G	0.40	—	—	United States of America
Virginian ¹³⁴	WKV	300	American-Hawaiian S.S. Co.	300, 600	P G	0.20 ¹¹¹ 0.40 ¹¹²	—	—	United States of America
Virginie ¹	FTV	250	Compagnie Générale Transatlantique, Paris	300, 600	P G	0.40	—	—	France

Shipboard Stations—Continued

Name.	Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Virsatis ¹ ..	KCL	—	Navy	—	O	X	0.15	—	Lettonia
Viscount ..	GEVJ	—	Navy	—	PG	—	—	—	Great Britain
Visna ¹ ..	TPX	200.	(Armateurs) Finn Friis & C. O., Lund Draumien	300, 600	PG	X	0.40	4.00	Norway
Vistula ¹ ..	DTV	200	Baltisch-Amerikanische Petroleum -Import-Gesellschaft m. b. H. Zoppot	300, 600	PG	0800 to 0900 1900 to 2000	0.40	4.00	Danzig
Vita ¹⁹ ..	MZV	230	—	300, 600	PG	X	0.40	—	Great Britain
Vitelia ¹⁰ ..	BAR	140	—	300, 600	PG	N	0.40	—	Great Britain
Vitruvia ¹⁰ ..	GYS	180	—	300, 600	PG	X	0.40	—	Great Britain
Vitry-le-François ..	FBVL	125	Siemens Bros., & Co., Ltd., Wool- wich, London, S.E. 18	300, 800	PG	X	0.40	—	France
Vittoria GCWR ¹¹ ..	GCWR	140	La Lucania, Società di Navigazione, Naples	300, 450, 600	PG	X	0.40	—	Great Britain
Vittoria IAS ¹⁷ ..	IAS	140	Compagnie Italiana di Navigazione, E. Commercio d'Oltremare (C.I.N.C.O.), Genoa	300, 600	PG	X	0.40	—	Italy
Vittoria IYP ¹⁷ ..	IYP	140	Vittoria, Società Anonima di Navi- gazione, Genoa	300, 600	PG	X	0.40	—	Italy
Vittorio ¹⁷ ..	IVY	140	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	X	0.40	—	Italy
Vittorio Emanuele	IHN	—	—	—	—	—	—	—	Italy
Vittorio Emanuele	KDJF	300	—	—	—	—	—	—	United States of America
Vittorio III ^{9 131} ..	IUC	190	La Veloce Società di Navigazione, Rome	300, 600	PG	X	0.40	—	Italy
Vittorio Veneto ¹⁷ ..	TKX	100	Vlada de Llusa, y R. Masia, Barcelona	300, 600	PG	N	0.30	3.00	Spain
Vinda de Lusá ¹ ..	TKY	150	Manuel Lopez Marin, Barce- lona	300, 600	PG	N	0.30	3.00	Spain
Viva ¹ ..	GEVK	—	Navy	—	PG	—	—	—	Great Britain
Vivacious ..	GEVL	—	Navy	—	PG	—	—	—	Great Britain
Viven ..	NSU	—	Navy	—	PG	—	—	—	United States of America
Vixen ⁹⁹ ..	WSQ	500	Ynchausti S.S. Co. ..	300, 600	PG	N	0.20 ¹¹¹	—	United States of America
Vizcaya ..	OLV	150	Stoomvaart Maatschappij Triton Rotterdam	300, 600	PG	X	—	—	Holland
Vieland ¹ ..	GDER	—	Navy	300, 600	PG	X	0.40	4.00	Great Britain
Vogtland ¹⁹ ..	SZAS	—	Navy	—	O	X	—	—	Greece
Vothitikon ¹ ..	SZBS	—	Navy	—	O	—	—	—	Greece
Vothitikon ² ..	SZCS	—	Navy	—	O	—	—	—	Greece
Vothitikon ³ ..	SZCS	—	Navy	—	O	—	—	—	Greece

VOITHIKON 4	..	SZDS	—	Navy	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, / Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Vulcan 1...	FRV	350	Société les Affrèteurs Réunis, Paris	300, 600	P G	X	0.40	—	France
Vulcan GEYK	GEYK	—	Navy	—	P G	—	—	—	Great Britain
Vulcan City 10	GBYL	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Vulcan NVT 9	NVT	—	Navy	300, 600	P G	N	0.20 111 0.40 112	—	United States of America
Vulcano CTM	CTM	100-150	Navy	300, 600	O	—	—	—	Portugal
Vulcano IGL	IGL	190	Navy	300, 600	P G	X	—	—	Italy
Vulcano IZO	IZO	190	Navigazione Generale Italiana, Genoa	300, 600	P G	—	0.40	—	Italy
Vulcanus PAS	PAS	200	Navy	600	O 30	—	—	—	Holland
Vulcanus TXN 1..	TXN	150	Koninklijke Nederland Stoomboot Maatschappij, Amsterdam	300, 450 600, 800 300, 600	P G	X	0.40	4.00	Holland
Vulture 10	GDTN	—	—	300, 600	P G	X	0.10 87	1.00 87	Great Britain
Waaldijk 1	PGV	150	Nederlandsche Stoomboot Maatschappij Holland-Amerika Lijn, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Waalhaven 1	TYI	150	Maatschappij Stoomschip, Waalhaven, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Waban 103	KJT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	N	0.40	—	United States of America
Wabana VGCL 21	VGCL	200	Dominion Iron & Steel Co., Ltd., Sydney, N.S.	300, 450 600, 800	P	— 27	0.40	—	Canada
Wabana YNL 10	YNL	170	North Atlantic & Western S.S. Co.	300, 450, 600	P G	X	0.40	—	Great Britain
Wabash 9 101	WNC	300	Standard Transport Co., Ltd.	300, 450, 600	P G	X	0.40	—	United States of America
Wabasha 1	GTN	150	Transports Maritimes de l'Etat	300, 450, 600	P G	X	—	—	Hong Kong
Wachtfels	UEG	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	France
Wachtheister	SCM	—	U.S. Shipping Board, Washington (D.C.)	300, 600	O 30	—	—	—	Sweden
Wachusett 9 101	WJL	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Waco 9 101	KIRP	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Warosta 27	KDLM	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600 1,800	P G	X	0.40	—	United States of America
Waddon 10	ZWY	155	—	300, 600	P G	—	0.40	—	Great Britain
									0600 to 0800 0900 to 1200 1400 to 1800

	NKW	—	Navy	* 300, 600	PG	N	0.20 0.40 112 0.40 0.40	4.00 4.00	Germany Norway France Great Britain United States of America
Wadsworth ⁹⁹	..	—	(Armateurs) Brodrene, Wilhelm- sen Bergen	300, 450, 600	PG ..	X	0.40 112	4.00	Germany
Waganda ⁸⁵	..	200	Altazin, Darguer & Cie., Boulogne	300, 600	PG ..	X	0.40	4.00	Norway
Wagland ¹	..	200	sur-Mer	300, 600	PG ..	X	0.40	—	France
Wagram ¹	..	200	AmalgamatedWireless(Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Wahine ⁷¹	..	250	Wahkena Steamship Company, 1, Drum. Street, San Fran- cisco (Cal.)	300, 600	PG ..	X	0.40	—	United States of America
Wahkena ²	..	200	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waihemo ⁷¹	..	—	AmalgamatedWireless(Australasia), Ltd.	300, 600	PG ..	X	0.20	—	Great Britain
Waibora ⁷¹	..	325	—	300, 450, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waikawa ¹⁹	..	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40	—	Great Britain
Waihouiti ⁷¹	..	—	Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waimana ¹⁹	..	230	AmalgamatedWireless(Australasia), Ltd.	300, 600	PG ..	X	0.40	—	Great Britain
Waimarino ⁷¹	..	200	—	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waimate ¹⁹	..	140	Navy	300, 600	PG ..	X	0.40 112	—	Great Britain
Wainwright ⁹⁹	..	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40 112	—	United States of America
Waiotapu ⁷¹	..	—	Union S.S. Co. of N.Z., Ltd. ..	300, 450, 600	PG ..	X	0.40	—	Great Britain
Waipara ¹⁹	..	125	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40	—	Great Britain
Waipori ³	..	250	—	300, 600	PG ..	X	0.20	—	New Zealand
Wairuna ⁷¹	..	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waiemata ⁹¹	..	—	Wireless (Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waiomo ⁷¹	..	300	AmalgamatedWireless(Australasia), Ltd.	300, 600	PG ..	X	0.40 ⁸¹	—	Great Britain
Waivera ¹⁹	..	240	Navy	300, 600	PG ..	X	0.40	—	Great Britain
Wajao ³⁰	..	60	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	PG ..	X	0.40	4.00	Germany
Wakamiya ¹	..	—	—	—	O ..	—	—	—	Japan
Wakasa Maru ¹	..	400	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	—	0.40	—	Japan
Wakeful	—	U.S. Shipping Board, Washington (D.C.)	300, 600	PG ..	N	—	—	Great Britain
Wakulla ¹⁰³	..	200	Stoomvaart Maatschappij Triton, Rotterdam	300, 600	PG ..	X	0.40	—	United States of America
Walcheren ¹	..	200	Navy	300, 800	PG ..	X	0.40	4.00	Holland
Waldeck-Rousseau	..	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG ..	N	0.05	—	France
Walden ^{9 101}	..	300	—	—	PG ..	X	0.40	—	United States of America

Shipboard Stations—Continued

Name	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.	Country.
Wales Maru ¹	SCA	400	Navy	300, 600	O ²⁰	—	—	Sweden
Walhall	JAWA	250	Kawasaki Zosenjo	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Walker GEVR ⁸⁰	UBK	—	Transports Maritimes de l'Etat	300, 600	P G	—	0.40	France
Walker NESX ⁸⁰	NWL	—	Navy	300, 600	P G	X	0.20 ¹¹ 0.40 ¹²	United States of America
Wallace GELB ¹⁰	GEVR	—	Navy	300, 600	P G	—	0.40	Great Britain
Wallace MQX ¹⁰	NESX	—	Navy	300, 600	P G	N	0.20 ¹¹ 0.40 ¹²	United States of America
Wallflower	GELB	—	Navy	300, 600	P G	X	0.40	Great Britain
Wallingford ⁹ 121	MQX	—	Navy	300, 600	P G	—	—	Great Britain
Wallkill ⁹ 121	GFIZ	150	U.S. Shipping Board, Washington (D.C.)	300, 475, 600	P G	—	0.40	United States of America
Walhus ⁹⁷	KEPV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Walmer Castle ⁸⁰	KIPD	100	Port of Portland, Oregon Portland (Oregon)	300, 450, 600	P G	X	0.40	United States of America
Walpole	WPLY	350	Navy	300, 450, 600	P G	N	0.40	Great Britain
Walrus	MOH	—	Navy	300, 450, 600	P G	—	—	Great Britain
Walter A. Luckenbach ⁸⁷	GEVT	300	Luckenbach Co., Incorp., Whitehall St., New York (N.Y.)	300, 450	P G	—	—	United States of America
Walter D. Munson ⁸ 11	KJIE	150	Munson S.S. Lines Incorp., 82-92, Beaver St., New York (N.Y.)	300, 600	P G	X	0.40	United States of America
Walter D. Noyes ²	KVJ	—	Crowell & Thunlow S.S. Co., 131, State St., Boston (Mass.)	300, 600	P G	X	0.20	United States of America
Walter Jennings	KDY	300	Standard Oil Co. of N.J. Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G	X	—	United States of America
Watson Hall ¹⁰	KDPL	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Wampun ¹⁰³	MTH	300	Yacht belonging to Geo.C. Sherman Watertown (N.Y.)	300, 450, 600	P G	X	0.40	United States of America
Wana ²	KROI	100	Union S.S. Co. of N.Z., Ltd.	300, 600	P	X	—	United States of America
Wanaka ³	KYX	250	Navy	300, 600	P G	X	0.20 ¹¹ 0.40 ¹²	New Zealand
Wandank ⁴⁰	VMP	—	Navy	300, 600	P G	X	—	United States of America
	NARF	—	Navy	300, 600	P G	N	—	United States of America

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Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country
							Per Word.	Minimum per Radio-tele-gram.	
Warszawa ¹	VZBQ	300	—	300, 600	P G	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time) X	0.20 ⁸ 0.40 ⁸	—	Australian Commonwealth
War Sudra ¹⁹	GCVF	—	—	300, 600	P G	X	0.40	—	Great Britain
Warszawa GZG ¹⁸	GZG	—	—	300, 600	P G	X	0.40	—	Great Britain
Warszawa PHX ¹	PHX	250	Nederlandsche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 N	0.40	4.00	Holland
Warszawa WLM ¹²¹	WLM	300	Polish American Navigation Corp., 206, Broadway, New York (N.Y.)	300, 600	P G	—	0.40	—	United States of America
Wartburg ³⁵	DWB	200	—	300, 600	P G	1100 to 1300 2000 to 2200 N	0.40	4.00	Germany
Wartenfels ³⁵	DBL	200	Director, India Office, Shipping, 5, Bishopsgate, London, E.C. 2	300, 600	P G	X	0.40	—	Germany
Wartum ⁷¹	BLY	—	Navy	300, 600	P G	X	0.40	—	Great Britain
Warwick GEVX	GEVX	—	U.S. Shipping Board, Washington (D.C.)	—	P G	X	—	—	Great Britain
Warwick KESX ⁸⁷	KESX	300	—	300, 600	P G	—	0.40	—	United States of America
Warwickshire ³⁶	MYO	300	—	300, 450, 600	P G	X	0.40	—	Great Britain
Wasa AZF ¹	AZF	100	—	300, 450, 600	P G	X	0.40	—	United States of America
Wasa SBI	SBI	—	Navy	—	O ³⁸	—	—	—	Sweden
Wasagya ¹³¹	KOPN	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Wascana ¹	ASM	200-300	(Armateur) Chr. Haaland, Haugesund	300, 450, 600	P G	X	0.40	—	Norway
Washington Maru ¹	JIU	500	Kokusai Kisen Kaisha	300, 600	P ³⁸	0800 to 1100 1400 to 1700 2000 to 2400 N	0.40	—	Japan
Washington LQQ ¹	LQQ	135	Nicola's Mihanovich Compania, Ltd., Buenos Aires	300, 600	P G	N	0.40	—	Argentine Republic
Washington NWE ³⁸	NWE	—	Navy	300, 600	P G	N	0.40	—	United States of America
Washtenaw ¹²¹	WPOO	300	Union S.S. Co., Mill's Building, San Francisco (Cal.)	300, 600	P G	X	0.40 ¹¹¹ 0.40 ¹¹⁸ 0.40 ¹²²	—	United States of America

Wasmuth 92	NUKC	Navy	300, 500	PG	—	0.40 112	United States of America
Wassaie 97	KROO	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	Holland
Wassenaar 1	TYG	Maatschappij Stoomschip Wasse- naar, Rotterdam	300, 600	PG	..	4.00	Germany
Wasserfahrzeug W 4 1	AHX	Navy	—	O	..	—	Germany
Wasserfahrzeug W 5 1	AHY	Navy	—	O	..	—	United States of America
Watauga 9 131	WQT	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	Great Britain
Wathman	GEVY	Navy	—	PG	..	—	United States of America
Wathbury	KUPT	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	..	0.40	Great Britain
Waterford 71	YZY	Great Western Railway Co.	300, 600	PG	..	1.00 87	Great Britain
Waterhen	GEVZ	Navy	—	PG	..	—	Holland
Waterland 1	PZN	Koninklijke Hollandsche Lloyd, Amsterdam	300, 600	PG	..	4.00	United States of America
Waters 99	NATT	Navy	300, 800	PG	..	0.20 111 0.40 112	United States of America
Watertown 9 131	KING	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Wathena 97	WDIE	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Watowan 97	WDII	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Watness 19	YLE	—	300, 600	PG	..	0.40	Great Britain
Watuka 21	CKU	Nova Scotia Steel & Coal Co., New Glasgow, N.S.	300, 600	P	..	0.40	Canada
Waubesa 97	WG00	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	..	0.40	United States of America
Wauconda 103	WREE	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Waukan 133	KIDV	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Waukegan 97	KIDX	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Waukesha 103	KKEO	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Wauwatosa 97	KUCK	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	..	0.40	United States of America
Wawalona 103	KEXM	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Waxahachie 9 131	KILM	U.S. Shipping Board, Washington (D.C.)	300, 600	PG	..	0.40	United States of America
Wayfarer 19	GCI	—	300, 600	PG	..	0.40	Great Britain
W.B. Keene 9 131	KWK	Savannah-New York Transporta- tion Co., 17, Battery Place, New York (N.Y.)	300, 600	PG	..	0.40	United States of America
W. C. Franz 21	VG DY	Algoma Central & Hudson Bay Rly. Co., Sault Ste Marie, Ont.	300, 600, 800	P	..	0.40	Canada
W. C. Teagle 9 131	KTY	Standard Oil Co. of N.J. Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	PG	..	0.40	United States of America
W. D. Matthews 21	CKK	Canada S.S. Lines, Ltd., Montreal, P.Q.	300, 600	P	..	0.40	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-gram.	
Wear VKG ¹	..	300	—	300, 600	P G	0930 to 1030 1200 to 1300 ⁸ 1400 to 1430 ⁵ 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth
Wearbridge ⁷¹	..	—	Operated by the North of England S.S. Co., Surtees St., West Hartlepool	300, 600	P G	..	0.40	—	Great Britain
Wearpool ¹⁹	..	140	—	300, 600	P G	..	0.40	—	Great Britain
Wearwood ¹⁹	..	140	—	300, 600	P G	..	0.40	—	Great Britain
Wedgwood ¹⁸	..	160	—	300, 600	P G	..	0.15 ⁸²	1.50 ⁸²	Great Britain
Weehawken ¹⁸	..	120	—	300, 600	P G	..	0.40	—	Great Britain
Weimar ¹⁹	..	300	—	300, 600	P G	..	0.15 ⁸²	1.50 ⁸²	Great Britain
Wekika ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	..	0.40	—	United States of America
Welborn C. Wood ⁸⁹	..	—	Navy	300, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Wellan de Besche ¹	..	250	Holmens Bruks och Fabriks Aktie bolag, Norrköping	300, 600	P	0800 to 0830 1200 to 1230 1800 to 1830 (local mean time)	0.40	4.00	Sweden
Wellen ⁸⁴	..	—	Navy	300, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Wellgunde ⁸⁵	..	200	Henry W. Cook, 437, Chestnut Street, Philadelphia (Pa.)	300, 450, 600	P G	..	0.40	—	Germany
Wellington KMR ⁸ 121	..	150	(Armateur) John Sieviet, Bergen	300, 450, 600	P G	..	0.20 ¹¹¹ 0.40 ¹¹²	4.00	United States of America
Wellington LGO ²³	..	100—150	—	300, 600	P G	..	0.40	—	Norway
Wellpark ¹⁹	..	130	—	300, 600	P G	..	0.40	—	Great Britain
Wells City ¹⁹	..	150	—	300, 600	P G	..	0.40	—	Great Britain
Welsh City ¹⁹	..	—	—	300, 450, 600	P G	..	0.40	—	Great Britain
Welshman ¹⁹	..	240	—	300, 600	P G	..	0.40	—	Great Britain
Welsh Prince ¹⁹	..	150	Wenceslag Jonzalez Jarra,	300, 450, 600	P G	..	0.40	—	Great Britain
Wenceslau ¹	..	125	Lloyd Brasileiro, Rio de Janeiro	300, 600	P G	..	0.30	—	Spain
Wenceslau Braz ¹⁵	..	200	Navy	300, 600	P G	..	0.40	—	Brazil
Wendmuth ²⁵	..	—	—	300, 600	P G	..	0.40	—	Germany
Wenonath ⁹⁶	..	—	—	300, 600	P G	..	0.40	—	Germany

SHIP	CALL LETTERS	CLASS	YEAR BUILT	TONNAGE	REGISTERED	OWNER	DESTINATION	STATUS	REMARKS
Westworth 10	GBCN	170	..	300, 600	PG	..	..	..	..
Wendlands 30	DWR	200	..	300, 600	PG	..	..	..	..
Werner Vinnen 35	DYY	200	..	300, 450, 600	PG	..	..	..	..
Werribee 1	VJL	300	..	300, 600	PG	..	..	..	..
Wesseling 1	UHX	250	..	300, 450, 600	PG	..	Société les Armateurs, Français, 6, Rue Vignon, Paris	..	..
Wessox	GEWB	—	..	—	PG	..	Navy	..	..
Westralia 1	VJB	250	..	300, 600	PG	..	..	..	..
West Alcor 103	KIDD	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Alsek 103	KJUO	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Amargosa 103	KEJS	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Apauni 97	KJUU	300	..	300, 450, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Arrow 97	WKS	200	..	300, 476, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Ashawa 97	KFH	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Avenal 103	KENG	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
Westboro 9 131	KDJH	150	..	300, 450, 600	PG	..	U.S. Shipping Board, Washington	..	..
Westborough 19	BDJ	140	..	300, 600	PG	..	—	..	..
West Bridge 103	KJOO	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
Westbrook 97	WLI	200	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
Westbury 19	GFTB	—	..	300, 600	PG	..	—	..	..
West Cactus 103	KIVV	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Caddoa 103	KODF	300	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Cadron	KUDK	200	..	300, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Cahokia 103	KUPJ	300	..	300, 450, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Cajoot 103	KEXX	300	..	300, 476, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Calera 97	KUMM	300	..	300, 450, 600	PG	..	U.S. Shipping Board, Washington	..	..
West Calumb 103	KILT	300	..	300, 450, 600	PG	..	U.S. Shipping Board, Washington	..	..

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-tele-gram.	
West Camak ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	—	0.40	—	United States of America
West Camargo ^{9 131}	..	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Campgaw ⁹⁷	..	—	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Canon ⁹⁷	..	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America
West Cape ¹⁰³	..	300	U.S. Shipping Board, Washington	300, 600	P G	N	0.40	—	United States of America
West Carmona ⁹⁷	..	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America
West Carnifax ^{9 131}	..	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Catance ¹⁰³	..	300	Elder Steel S.S. Company, 50, Broad St., New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America
West Cavalan ^{9 131}	..	300	Imperial Shipping Corporation	300, 450, 600	P G	X	0.40	—	United States of America
West Cawthon ^{9 131}	..	300	Imperial S.S. Corporation, 115, Broadway, New York (N.Y.)	300, 600	P G	N	0.40	—	United States of America
West Cayote ^{9 131}	..	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Celeron ¹⁰³	..	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America
West Cefina ^{9 131}	..	300	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Chatala ¹⁰³	..	200	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Cherow ^{9 131}	..	300	U.S. Shipping Board, Washington	300, 600	P G	X	0.40	—	United States of America
Westchester ⁹⁷	..	200	U.S. Shipping Board, Washington	300, 476, 600	P G	X	0.40	—	United States of America
West Cheswald ^{9 131}	..	200	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Chetac ¹⁰³	..	—	U.S. Shipping Board, Washington	300, 450, 600	P G	X	0.40	—	United States of America
West Chopaka	..	300	U.S. Shipping Board, Washington	300, 600, 1,800	P G	X	0.40	—	United States of America
West Coast ⁹⁷	..	300	U.S. Shipping Board, Washington	300, 600	P G	N	0.40	—	United States of America

Shipboard Stations

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Line	Ship	Class	Builder	Year	Port	Flag	Owner	Notes
1	West Cobalt ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
2	West Cohas ^{9 131}	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
3	West Compo ⁹⁷	200	U.S. Shipping Board, Washington (D.C.)	1900	300, 476, 600	P G	United States of America	
4	West Conob ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
5	West Corum ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
6	Westcott	—	Navy	—	—	P G	Great Britain	
7	West Cressy ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
8	West Cussetta ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
9	West Durfee ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
10	West Eagle ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
11	West Ekonk ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
12	West Elcajon ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
13	West Elcasco ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
14	West Eldara ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
15	Westerdijk ^{PGZ}	250	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland	1900	300, 450, 600, 800	P G	Holland	
16	Westerdijk ^{PZT}	200	Stoomvaart Maatschappij, Holland	1900	300, 600	P G	Holland	
17	Western Ally ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
18	Western Belle ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
19	Western Chief ^{9 131}	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
20	Western City ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
21	Western Comet ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
22	Western Cross ^{9 131}	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
23	Westerner ^{9 131}	100	U.S. Shipping Board, Washington (D.C.)	1900	300, 600	P G	United States of America	
24	Western Glen ¹⁰³	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 378, 600	P G	United States of America	
25	Western Hero ⁹⁷	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	
26	Western Hope ^{9 131}	300	U.S. Shipping Board, Washington (D.C.)	1900	300, 450, 600	P G	United States of America	

Shipboard Stations—Continuea

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Meters (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Western King ^{9 131}	WEP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Western Knight ^{9 7}	KEFQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Western Light ^{9 7}	KQOI	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Western Maid ¹⁰³	KQOO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Western Ocean ¹⁰³	KJEA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western Plains ^{9 131}	WZIU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Western Pride ¹⁰³	WGT	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western Queen ^{9 131}	WWK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western Scout ¹⁰³	WXFA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western Sea ¹⁰³	KNAA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Western Spirit ¹⁰³	KNEA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western Star ¹⁰³	WEU	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western States ⁹	WED	150	Detroit and Cleveland Navigation Co., Detroit (Mich.)	300, 450, 600	P G ..	N	0.20	—	United States of America
Western Valleys ¹⁹	GCKY	135	—	300, 600	P G ..	X	0.40	—	Great Britain
Western Wave ^{9 7}	WWC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Western World ^{9 7}	KDYI	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
West Errol ^{9 131}	KERJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Westerswald ³²	DWL	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Westfalen ³⁵	DWE	200	—	300, 600	P G ..	X	0.40	4.00	Germany
West Farolan ⁹	KDSX	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,300	P G ..	X	0.40	—	United States of America

Westfield ^{9 121}	..	KXU	50	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
Westford ¹⁰³	..	KNAU	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Galeta ⁹⁷	..	WFAE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Galoc ¹⁰³	..	KVEI	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Gambo ¹⁰³	..	KQUU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Gotomska ¹⁰³	..	WET	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Grama ^{9 131}	..	WGIA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G ..	X	0.40	United States of America
West Greylock	..	KDTV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Grove ^{9 131}	..	KJAU	200	U.S. Shipping Board, Washington (D.C.)	300, 378, 600	P G ..	X	0.40	United States of America
Westhampton ¹⁰³	..	WSP	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Harcuvar ⁹⁷	..	KEZM	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hardaway ¹⁰³	..	KEDX	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hargrave ⁹⁷	..	KEDZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Harlan ¹⁰³	..	KEFS	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Harshaw ⁹⁷	..	KEFX	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hartland ¹⁰³	..	KEGS	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Hartley ⁹⁷	..	KEGT	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Harts ¹⁰³	..	KEFZ	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hassayaupa ¹⁰³	..	KEGX	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Haven ⁹⁷	..	KJV	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Helix ⁹⁷	..	WSUA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Hematite ¹⁰³	..	KEZP	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	United States of America
West Hembre ^{9 121}	..	KEZN	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Henshaw ¹⁰³	..	KEBQ	200	U.S. Shipping Board, Washington (D.C.)	300, 476, 600	P G ..	X	0.40	United States of America
West Hepburn ⁹⁷	..	KINP	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hesselstine ⁹⁷	..	KOTN	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Hika ¹⁰³	..	KOZK	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America
West Himrod ⁹⁷	..	KUDQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs. Per Word.	Minimum Radio-telegram.	Country.
West Hixton ¹⁰³ ..	KUKV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Hobomac ⁹⁷ ..	WFAL	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Holbrook ¹⁰³ ..	KUXB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Houaker ⁹⁷ ..	KDFX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P G ..	—	0.40	—	United States of America
Westhope ¹⁹ ..	XXK	100	—	300, 600	P G ..	X	0.40	—	Great Britain
West Hoskie ⁹⁷ ..	WFEL	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Humhaw ⁹ ¹³¹ ..	WZAE	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
West Imboden ⁹ ¹³¹ ..	KECX	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Indian ¹⁰³ ..	KJAE	150	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Inskip ⁹ ¹³¹ ..	KITZ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Ira ⁹ ¹³¹ ..	KOGL	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Irmo ⁹ ¹³¹ ..	KIFB	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Islay ⁹ ¹³¹ ..	KICP	300	Imperial Shipping Corporation	300, 600	P G ..	X	0.40	—	United States of America
West Isleta ⁹ ¹³¹ ..	KICQ	200	Garland S.S. Corporation	300, 450, 600	P G ..	N	0.40	—	United States of America
West Islip ¹⁰³ ..	KIKX	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Ison ⁹ ¹³¹ ..	KINN	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Ivan ⁹ ¹³¹ ..	KOZS	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
West Ivis ¹⁰³ ..	KOQQ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Jaffrey ⁹⁷ ..	KOCX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
West Jappa ¹⁰³ ..	KUKJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
West Montpel ⁹⁷	KOTR	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Westmore ¹⁹	MXN	—	—	300, 450, 600	P G	X	0.40	—	Great Britain
Westmoreland KIQC ¹⁰⁸	KIQC	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	N	0.40	—	United States of America
Westmoreland ZBM ¹⁹	ZBM	180	—	300, 600	P G	0800 to 1200 1400 to 1500 1800 to 2400	0.40	—	Great Britain
Westmount KDYG ^{9 131}	KDJG	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Westmount XVI ²¹	XVI	150	Montreal Transportation Co., Ltd., Montreal (P.Q.)	300, 600	P	— ²⁷	0.40	—	Canada
West Munham ^{9 131}	KEXF	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
West Neris ¹⁰³	KOTK	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
West Niger	KOZJ	200	U.S. Shipping Board, Washington (D.C.)	300, 476, 600	P G	X	0.40	—	United States of America
West Nilus ^{9 131}	KUFJ	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
West Nivaria ⁹⁷	KUQJ	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
West Nohno ¹⁰³	KEXG	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
West Nomentum	KUSG	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
West Noska ^{9 131}	KEDV	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
West Notus ⁹⁷	KDAM	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Westoil ^{9 131}	KIVP	200	Waukau Transit Co.	300, 600	P G	X	0.40	—	United States of America
West O'Kowa ⁹⁷	KDQI	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P G	X	0.40	—	United States of America
Westplain ¹	TZL	200	Scheepvaart Maatschappij Millingen, Rotterdam	300, 600	P G	X	0.40	—	United States of America
West Pocasset ⁹⁷	KOCK	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
West Point ^{9 131}	KJY	150	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	4.00	Holland
						N	0.40	—	United States of America

Ship	WROA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	N	0.40	United States of America
Westpool ^{9 131}	WROA	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	N	0.40	United States of America
Westport ^{9 131}	WFEO	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Prospect ⁹⁷	KDUK	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600, 1,800	P.G.	X	0.40	United States of America
West Quebec	KEDT	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	N	0.40	United States of America
Westra ¹⁹	YDO	190	—	300, 600	P.G.	X	0.40	Great Britain
West Raritan ^{9 131}	KIXC	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West Saginaw ^{9 131}	KOCV	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Segovia ¹⁰⁵	KIPK	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West Selene ¹⁰³	KIXZ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West Sequana ¹⁰³	WSOI	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Shore ^{9 131}	WMD	100	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Tacook ¹⁰³	KECR	200	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West Togos ⁹⁷	KEXJ	300	U.S. Shipping Board, Washington (D.C.)	300, 600, 1,800	P.G.	X	0.40	United States of America
West Totant ¹⁰³	KEXK	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Vaca ¹⁰³	KEMX	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West View ⁹⁷	WDIU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	N	0.40	United States of America
West Virginia ⁹⁹	NEDJ	—	Navy	300, 600	P.G.	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Westward Ho ^{9 131}	WKX	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Wauna ⁹⁷	WSUE	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Waunake ¹⁰³	WSUI	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
Westwego ^{9 103}	KGE	200	Union Petroleum S.S. Co., 26, Broadway, New York (N.Y.)	300, 450, 600	P.G.	N	0.40	United States of America
West Wind ⁹⁷	KJH	100	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	N	0.40	United States of America
Westwood ⁹⁷	WTF	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	N	0.40	United States of America
West Zeda ¹⁰³	WKUU	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P.G.	X	0.40	United States of America
West Zucker ⁹⁷	WJIA	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
West Zula ¹⁰¹	WQEO	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P.G.	X	0.40	United States of America
Wethersfield ²¹	CHP	150	The Canadian Maritime Co., Ltd., Montreal (P.Q.)	300, 600	P	N ²⁷	0.40	Canada

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Country.
							Per Word.	Minimum per Radio-gram.	
Weybourne	GFOD	—	Navy	—	P G	—	—	—	Great Britain
Weymouth	GEKC	—	Navy	—	P G	—	—	—	Great Britain
W. F. Burrows ⁹⁷	WHG	200	Libby, McNeil & Libby, 417, Market St., San Francisco (Cal.)	300, 450, 550, 600	P G	X	0.20 ¹²²	—	United States of America
W. F. White ^{9 131}	WGC	150	Limestone Transportation Co., Roger's City (Mich.)	300, 600	P G	X	0.20	—	United States of America
W. Grant Morton ²¹	CKL	150	Canada Interlake Line, Ltd., Toronto (Ont.)	300, 600	P	— ²⁷	0.40	—	Canada
Whakatane ¹⁹	MRI	180	—	300, 600	P G	X	0.40	—	Great Britain
Whangape ²	VML	200	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—	New Zealand
Whately Hall ¹⁹	EZW	140	—	300, 600	P G	X	0.40	—	Great Britain
Wheatland Montana ^{9 131}	KISF	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Wheeling ⁸⁹	NWH	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Wheeling Mold ¹⁰³	KUNM	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
Whimbrel ¹⁹	YGO	120	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Whinfield ¹⁹	BQF	150	—	300, 600	P G	X	0.40	—	Great Britain
Whipple ¹⁰²	NUNL	—	—	300, 600	P G	N	—	—	United States of America
Whippoorwill ⁹⁹	NIJQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Whirlwind	GEWF	—	Navy	—	P G	—	—	—	Great Britain
Whitby Abbey ¹⁹	GCBK	120	—	300, 600	P G	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Whitgate ¹⁹	GCKX	—	—	300, 600	P G	X	0.40	—	Great Britain
Whitehall ¹⁹	GFIP	110	Navy	—	P G	—	—	—	Great Britain
Whitemantle ¹⁹	GDTB	100	E. J. Statesbury	300, 600	P	X	0.10 ⁸⁷	1.00 ⁸⁷	United States of America
Whitmarsh ²	KOMG	—	—	300, 600	P G	—	—	—	Great Britain
Whitley ¹⁰²	GEWJ	—	Navy	300, 600	P G	—	—	—	Great Britain
Whitney ¹⁰²	NIRL	—	—	300, 600	P G	—	—	—	United States of America
Whitshed ¹⁰²	GEWK	—	Navy	300, 600	P G	—	—	—	Great Britain
Whitwood ¹⁹	XFR	120	Standard Oil Co. of N.J.,	300, 600	P G	X	0.15 ⁸²	1.50 ⁸²	Great Britain
W. H. Libby ^{9 131}	KDMP	300	26,	300, 450, 600	P G	X	0.10	—	United States of America

W. H. McGean ²	WMIO	150	Pioneer S.S. Co.	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
W. H. Tilford ^{9 131}	KPD	300	Standard Oil Co. of N.J., Incorp., 26 Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	United States of America
Wicasta ²	KIJG	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Wichita ¹⁰³	KDMU	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Wickes ³⁹	NATJ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Widder ³⁵	DCL	200	—	300, 600	P G	X	0.40	Germany
Widgeon ⁹⁹	NAQF	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Widnes	GLIC	—	Navy	—	P G	—	—	Great Britain
Wiegand ³⁵	DQK	200	—	300, 600	P G	X	0.40	Germany
Wieldrecht ¹	PYE	150	Maatschappij Stoomschip Wield- recht, Rotterdam	300, 600	P G	X	0.40	Holland
Wien ⁴⁰	OHQ	150	Akteselskabet Dampskibsselskabet Patria, Copenhagen	300, 450, 600, 800	P G	X	0.40	Denmark
Wigbert DWG ¹	DWG	300-400	Hamburg-Bremer-Afrika-Linie, A. G. Bremen	300, 600	P G	N	0.40	Germany
Wik ¹	DWC	Day 100 Night 180	—	300, 450, 600	P R ¹³	X	0.40	Germany
Wild Swan	GEWL	—	Navy	—	P G	—	—	Great Britain
Wildwood ⁹⁷	KORV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Wilfred FLE ¹	FLE	150	Joseph Lasry (Armateur), 14, Avenue de l'Opera, Paris ..	300, 600	P G	X	0.40	France
Wilfred TSH ¹	TSH	150	(Armateurs) A/S det Selmerske Rederi, Trondhjem	300, 450, 600	P G	X	0.40	Norway
Wilfrid Laurier ¹	HTI	250	Transports Maritimes de l'Etat	300, 600	P G	X	0.40	France
Wilhelm ³⁵	DWI	200	—	300, 600	P G	X	0.40	Germany
Wilhelmina ^{9 131}	WMO	250	Matson Navigation Co., 268, Market Street, San Francisco (Cal.)	300, 450, 600	P G	N	0.40	United States of America
Wilhelm Russ ³⁵	DWM	200	—	300, 450, 600	P G	X	0.40	Germany
Wills ¹	PFG	200	Stoomvaart Maatschappij Rotter- damsche Lloyd, Rotterdam	300, 600	P G	—	0.40	Holland
Wilkes ³⁹	NKQ	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	United States of America
Willamette ²	WSW	200	Willamette S.S. Co., Fife Building, San Francisco (Cal.)	300, 600	P G	N	0.40	United States of America
Willaston ¹⁹	YCP	160	—	300, 600	P G	X	0.40	Great Britain
Willcasino ¹⁹	EVP	155	—	300, 600	P G	X	0.40	Great Britain
Willem Barentsz ¹	HED	200	Bureau Wijsmuller Scheepvaart Transport en Zeesleepvaart Maatschappij, Rotterdam	300, 600	P G	X	0.40	Holland

Shipboard Stations—Continued

Name.	Call Signal	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, France.		Country.
							Per Word.	Minimum per Radio-telegram.	
Willem van Driel, S.R. ¹	PHW	200	Stoomschip Willem van Driel Senior, Rotterdam	300, 600	P G	X	0.40	4.00	Holland
Willesden ¹⁰	EVG	140	—	300, 600	P G	X	0.40	—	Great Britain
Willet ⁹⁹	NIKN	—	Navy	300, 600	P G	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Willet ¹²⁰	KDKS	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
Willero ^{9 131}	KITX	300	Williams Steamship Company, 44 Whitehall Street, New York (N.Y.)	300, 600	P G	X	0.40	—	United States of America
Willhilo ^{9 131}	KUGV	—	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	—	United States of America
William A. McKenney ²	WOM	200	Crowell & Thurlow S.S. Co., 131 State St., Boston (Mass.)	300, 600	P G	X	—	—	United States of America
William A. Paine ^{9 131}	KDXZ	150	Pioneer S.S. Company	300, 600	P G	X	0.10 ¹¹⁹	—	United States of America
William A. Reiss ^{9 131}	WNI	150	Reiss S.S. Co., 402, Rockefeller Building, Cleveland (Ohio)	300, 600	P G	X	0.20	—	United States of America
William Balls ¹⁹	BTF	130	—	300, 600	P G	X	0.40	—	Great Britain
William B. Preston ⁹⁹	NUMQ	—	Navy	300, 600	P G	X	—	—	United States of America
William Campion ^{9 131}	KDAZ	300	Garland S.S. Corporation	300, 450, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
William G. Howard ¹⁰³	KIST	150	Thomas J. Howard	300, 600	P G	X	0.40	—	United States of America
William G. Mather ^{9 131}	KKUI	150	Cleveland Cliff Iron Co., Cleveland (Ohio)	300, 450, 600	P G	X	0.20	—	United States of America
William Green ^{9 13}	WIY	300	Pan-American Petroleum-Transport Co., Inc., 4615, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
William H. Doheny ^{9 131}	KDKG	300	Pan-American Petroleum and Transport Co., Incorpor., 1015, Security Building, Los Angeles (Cal.)	300, 450, 600	P G	X	0.40	—	United States of America
William H. Webb ¹⁰³	KOZV	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	—	United States of America
William Isom ^{9 131}	KVY	300	American - Italian S.S. Co., 52 Broadway, New York (N.Y.)	300, 450, 600	P G	X	0.40	—	United States of America

Shipboard Stations

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32 Broadway, New York 22, N. Y.

William Jones ⁵⁰	..	NARR	—	Navy	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.40	United States of America
William Middleton ¹⁰	..	XET	150	—	—	—	—	300, 600	P G	..	X	0.40	Great Britain
William N. Page ^{9 121}	..	WFOO	300	Castner, Curran & Bullitt, Incorp., 40, Central St., Boston (Mass.)	..	..	..	300, 450, 600	P G	..	X	0.40	United States of America
William Penn ⁹⁷	..	KDGV	—	U.S. Shipping Board, Washington (D.C.)	..	..	..	300, 600	P G	..	X	0.40	United States of America
William T. Roberts	..	KDUJ	150	American S.S. Company	..	..	..	300, 600	P G	..	X	—	United States of America
Williams CBC	..	CBC	—	Navy	..	..	..	—	—	—	—	—	Chile
Williams NENT ⁹⁹	..	NENT	—	Navy	..	..	..	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹² —	United States of America
Williamson ¹⁰²	..	NUNS	—	—	..	..	..	300, 600	P G	..	N	—	United States of America
Willmanic ⁹⁷	..	KMIO	300	U.S. Shipping Board, Washington (D.C.)	..	..	..	300, 450, 600	P G	..	X	0.40	United States of America
Willoughby ⁹⁹	..	NJX	—	Navy	..	..	..	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.40	United States of America
Willowmore ¹⁹	..	OEB	—	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
Willowpark ¹⁹	..	GFPL	—	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
Willpolo ^{9 121}	..	KOBM	300	U.S. Shipping Board, Washington (D.C.)	..	..	..	300, 600	P G	..	X	0.40	United States of America
Willsolo ^{9 121}	..	KUDL	—	U.S. Shipping Board, Washington (D.C.)	..	..	..	300, 450, 600	P G	..	X	0.40	United States of America
Wilmington ⁹⁹	..	NWK	—	Navy	..	..	..	300, 600	P G	..	N	0.20 ¹¹¹ 0.40 ¹¹² 0.40	United States of America
Wilcox ¹⁰³	..	WPAO	—	U.S. Shipping Board, Washington (D.C.)	..	..	..	300, 600	P G	..	X	0.40	United States of America
Wilton ¹⁹	..	GTN	155	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
Wimbledon ⁵⁰	..	LUK	100	—	..	..	..	300, 600	P G	..	X	0.40	Great Britain
Wimborne ¹⁹	..	EWE	160	—	..	..	..	300, 600	P G	..	X	0.40	Great Britain
Winereux ¹	..	FHW	200	Vidor & Cie., Boulogne-sur-Mer	..	..	..	300, 600	P G	..	X	0.40	France
Winamac	..	GSM	150	Standard Transport Co., Ltd.	..	..	..	300, 450, 600	P G	..	X	—	Hong Kong
Winchelsea	..	GEWM	—	Navy	..	..	..	—	P G	..	—	—	Great Britain
Winchester	..	GEWN	—	Navy	..	..	..	—	P G	..	—	—	Great Britain
Windber ^{9 121}	..	WND	300	Pacific-American Fisheries, Harris Avenue, Bellingham (Wash.)	..	..	..	300, 450, 600	P G	..	N	0.40	United States of America
Windermere ⁵⁰	..	GJCT	100	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain
Winding Gulf ^{9 121}	..	WFEE	300	Castner Curran & Bullitt, Incorp., 40, Central St., Boston (Mass.)	..	..	..	300, 600	P G	..	X	0.40	United States of America
Windsor	..	GEWP	—	Navy	..	..	..	—	P G	..	—	—	Great Britain
Windsor Castle ^{50 77}	..	GFMS	350	—	..	..	..	300, 450, 600	P G	..	X	0.40	Great Britain

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Wingtuit ⁷¹	..	—	Operated by the Amalgamated Wireless (Australasia), Ltd.	300, 450, 600	P G ..	X	0.40	—	Great Britain
Winifred ¹⁰³	..	200	Gulf Refining Co., West 7th St., Port Arthur (Texas)	300, 600	P G ..	X	0.40	—	United States of America
Winifred DWP ¹	..	250	—	300, 600	P G ..	1000 to 1200 1500 to 1800	0.40	4.00	Germany
Winifredian ¹⁹	..	250	—	300, 600	P G ..	N	0.40	—	Great Britain
Winkfield ¹⁹	..	175	—	300, 600	P G ..	X	0.40	—	Great Britain
Winnabago KTEI ⁹⁷	..	300	American Transatlantic Company, 17, Battery Place, New York (N.Y.)	300, 450, 525, 600	P G ..	X	0.40	—	United States of America
Winnabago ZAP ¹⁹	..	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Winneconne ⁹⁷	..	—	Winneconne S.S. Corp., 17 Battery Place, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Winona KUNV ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Winona VGDW ²¹	..	200	Canadian S.S. Lines, Ltd., Montreal, P.Q.	300, 600, 800	P ..	— ²⁷	0.40	—	Canada
Winona County ^{9 131}	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	N	0.40	—	United States of America
Winslow ⁹⁹	..	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Winston-Salem ⁹⁷	..	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Winsum ¹	..	200	Stoomvaart Maatschappij Oostzee, Amsterdam	300, 600	P G ..	X	0.40	—	Holland
Winterswijk ^{1 1 1}	..	100	(Direction of Erhardt & Dekkers), Maatschappij Stoomschip Wintertwijk, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland

Winterton ⁷¹	..	ODI	—	Denaby & Cadely Mam Collieries, Ltd.	300, 600	P G ..	X	0.40	—	Great Britain
Winyah ⁹⁷	..	KIMM	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
W. I. Radcliffe ¹⁹	..	LSA	145	—	300, 600	P G ..	X	0.40	—	Great Britain
Wisconsin ⁹⁸	..	NWM	—	Navy	300, 600	P G ..	N	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Wisconsin Bridge ^{9 131}	..	KIBM	—	French-American Line, 18, Broadway, New York (N.Y.)	300, 600	P G ..	X	0.40	—	United States of America
Wisdom II ²	..	KDNM	50	E. A. Salisbury	300, 600	P G ..	X	—	—	United States of America
Wishart	..	GEWQ	—	Navy	—	P G ..	—	—	—	Great Britain
Wishkah ⁹⁷	..	KNEU	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	X	0.40	—	United States of America
Wisla ^{9 131}	..	KOTP	200	Luis Millsaps	300, 600	P G ..	X	0.40	—	United States of America
Wisley ²¹	..	VGJS	130	Canada S.S. Lines, Victoria Square, Montreal (P.Q.)	300, 450, 600, 800	P G ..	— ²⁷	0.40	—	Canada
Wistaria	..	GFOC	—	Navy	—	P G ..	—	—	—	Great Britain
Witch	..	GFEL	—	Navy	—	P G ..	—	—	—	Great Britain
Witherington	..	GEWR	—	Navy	—	P G ..	—	—	—	Great Britain
Withernsea ⁷¹	..	GDZM	100	Hull Steam Fishing & Ice Co., Ltd.	300, 600	P ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Withington ¹⁹	..	ERR	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Witte Zee OLY ¹	..	OLX	200	Naamlooze Vermaatschap Stoom- schip Witte Zee, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Witte Zee PIC ¹	..	PIC	125	L. Smidt & Co's Sleepdienst, Rotterdam	300, 600	P G ..	X	0.40	4.00	Holland
Wivern	..	GEWS	—	Navy	—	P G ..	—	—	—	Great Britain
W. J. Crosby ^{9 131}	..	WXOE	200	North Shore Transit Company	300, 450, 600	P G ..	X	0.40	—	United States of America
W. J. Hanna ^{9 131}	..	KDKX	300	Standard Oil Co.	300, 450, 600	P G ..	X	0.40	—	United States of America
Wladimir Sawin ⁴⁰	..	—	—	Aktieselskabet Det Forneede Dampskib-Selskab, Copenhagen	—	—	—	—	—	Denmark
W. L. Connelly ^{9 131}	..	KQB	300	Snclair Gulf Corporation, 120, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
W. L. Steed ^{9 131}	..	WSEE	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio telegram.	
Wm. Boyce Thompson ^{9 121}	KDHS	300	Sinclair Navigation Co., 120, Broadway, New York (N.Y.)	300, 600	P G ..	N	0.20	—	United States of America
W. M. Burton ^{9 131}	KMIU	300	Atlantic Refining Company, 3,144, Passyunk Ave., Philadelphia (Pa.)	300, 600	P G ..	X	0.20	—	United States of America
Wm. F. Herrin ¹⁰¹	WTN	150	Assoc. Oil Company, 55, New Montgomery St., San Francisco (Cal.)	300, 600, 1,800	P G ..	X	0.40 ¹²²	—	United States of America
Wm. G. Warden ^{9 131}	F	300	Standard Oil Co. of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 450, 600	P G ..	X	0.40	—	United States of America
W. M. Irish ^{9 131}	KJOE	300	Atlantic Refining Company, 3,144, Passyunk Ave., Philadelphia (Pa.)	300, 600	P G ..	X	0.40	—	United States of America
Wm. Rockefeller ¹³⁵	KDVI	—	Standard Oil Co. of New Jersey	300, 450, 600	P G ..	X	—	—	United States of America
Wm. Th. Malling ⁴⁰	OHP	150	Aktieselskabet Det Danske Kulkomagni, Copenhagen	300, 450, 600, 800	P G ..	X	0.40	4.00	Denmark
W. M. Tupper ²	WJR	—	Gulf & Southern S.S. Co., Jacksonville (Fla.)	300, 600	P G ..	X	—	—	United States of America
Wodonga ¹	VHK	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time)	0.20 ⁸	0.40 ⁸	Australian Commonwealth
Woglinde ³⁵	DWO	200	—	300, 450, 600	P G ..	X	0.40	4.00	Germany
Wogo ⁴²	KDWM	150	Claud Nolan	300, 600	P R ..	X	—	—	United States of America
Woldingham ¹⁹	BOV	130	—	300, 600	P G ..	X	0.40	—	Great Britain
Wolf	PBW	—	Navy	600	O ¹⁰	—	—	—	Holland
Wolf-Hound	GEWT	—	Navy	—	P G ..	—	—	—	Great Britain
Wolftram ¹	DWF	300	—	300, 600	P G ..	—	—	—	Great Britain

Ship	Call	Frequency	Power	Station	Country	Notes
Wollin ¹	AHA	200	—	Navy	Germany	
Wolsey	GEWV	—	—	Navy	Great Britain	
Wolsun ¹	TYV	200	300, 600	Stoomvaart Maatschappij Oostzee, Amsterdam	Holland	4.00
Wolverton ¹⁹	ODQ	—	300, 600	Navy	Great Britain	
Wolverine GLID	GLID	—	—	Navy	Great Britain	
Wolverine NGW ⁹⁹	NGW	—	300, 600	Navy	United States of America	0.20 ¹¹¹ 0.40 ¹¹²
Wolverine State ^{9 131}	KDMQ	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	0.40
Wompatuck ⁹⁹	NVJ	—	300, 600	Navy	United States of America	0.20 ¹¹¹ 0.40 ¹¹²
Wongancilla ³	VNW	Day 100 Night 150	300, 600	Wm. Crosby & Co., Melbourne	South Africa (Union of)	0.20 ⁸ 0.40 ⁵
Wood ⁹⁹	NUMF	—	300, 600	Navy	United States of America	0.20 ¹¹¹ 0.40 ¹¹²
Woodarra ¹⁹	GCFK	—	300, 600	Navy	Great Britain	0.40
Woodburn ³⁰	XMA	100	300, 450, 600	Navy	Great Britain	0.40
Woodbury ⁹⁹	NATM	—	300, 600	Navy	United States of America	0.20 ¹¹¹ 0.40 ¹¹² 0.10 ⁸⁷
Woodcock EJB ⁷¹	EJB	—	300, 600	General Steam Navigation Co., Ltd.	Great Britain	1.00 ⁸⁷
Woodcock NIKP ⁹⁹	NIKP	—	300, 600	Navy	United States of America	0.20 ¹¹¹ 0.40 ¹¹² 0.10 ⁸⁷
Woodcock GDTV ¹⁹	GDTV	120	300, 600	G. & J. Burns, Ltd.	Great Britain	1.00 ⁸⁷
Woodcock GLIF	GLIF	—	—	Navy	Great Britain	—
Woodfield ¹⁹	YNA	140	300, 600	Navy	Great Britain	0.40
Woodlark	GLIJ	—	—	Navy	Great Britain	—
Woodmansie ^{9 131}	KIPF	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	0.40
Woodville ¹⁹	XKQ	140	300, 600	—	Great Britain	0.40
Woodgat ¹⁹	VKM	300	300, 600	—	Australian Commonwealth	0.20 ⁸ 0.40 ⁵
Woodstock	—	—	—	—	—	—
Woolston	GEWX	—	—	Navy	Great Britain	—
Woodwith	GLIK	—	—	Navy	Great Britain	—
Woonsocket ^{9 131}	WCW	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	0.40
Worcester GFOB	GFOB	—	—	Navy	Great Britain	—
Worcester KIKL ⁹⁷	KIKL	300	300, 600	U.S. Shipping Board, Washington (D.C.)	United States of America	0.40

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Worden ¹⁰²	NUNM	—	—	300, 600	P G	N	—	—	United States of America
Wordsworth ¹⁹	GBLP	—	—	300, 600	P G	X	0.40	—	Great Britain
Woron ¹⁹	GBLX	—	—	300, 600	P G	X	0.40	—	Great Britain
Worsley Hall ¹⁹	MDW	160	—	300, 600	P G	X	0.40	—	Great Britain
Wotan DWD ³⁵	DWD	200	—	300, 450, 600	P G	X	0.40	4.00	Germany
Wotan GBLW ¹⁹	GBLW	—	—	300, 600	P G	X	0.40	—	Great Britain
Woyo Maru ¹	JAUA	400	Toyo Kisen Kaisha	300, 600	P G	0800 to 1100, 1400 to 1700 2000 to 2400	0.40	—	Japan
Wrangel	SCN	—	Navy	—	O ³⁸	—	—	—	Sweden
Wrangler ⁷¹	GDXV	50	—	—	P	X	—	—	Great Britain
Wray Castle ¹⁹	GDLK	—	Stanlee Shipbreaking & Salvage Co., Ltd.	300, 600	P G	X	0.40	—	Great Britain
Wraymore ¹⁹	OEI	—	—	300, 600	P G	X	0.40	—	Great Britain
Wron	GFAJ	—	Navy	300, 450, 600	P G	—	—	—	Great Britain
Wrestler	GEWY	—	Navy	—	P G	—	—	—	Great Britain
Wright ¹⁰²	NIRM	—	—	—	P G	—	—	—	Great Britain
Wryneck	GEWZ	—	Navy	300, 600	P G	N	—	—	United States of America
W. S. Miller ^{9 131}	KDMR	300	Standard Oil Company of N.J., Incorp., 26, Broadway, New York (N.Y.)	300, 600	P G	—	—	—	Great Britain
W. S. Porter ¹⁰¹	WTM	150	Associated Oil Company	300, 600, 1,800	P G	X	0.40	—	United States of America
W. S. Rheem ^{9 131}	KDWP	300	Standard Oil Co. of California, Incorp., Sheldon Building, San Francisco (Cal.)	300, 600	P G	X	0.20 ¹¹¹ 0.40 ¹¹²	—	United States of America
Wugo Maru ¹	JDE	400	Noguchi Kisen Kaisha	300, 600	P ³²	0800 to 1100 1400 to 1700 2000 to 2400 0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	Japan
Wulstye Castle ¹⁹	GOZ	140	—	300, 600	P G	—	0.40	—	Great Britain

Call Sign	Frequency	Power	Location	Service	Remarks	Country
Wirttemberg ²⁵	400	300, 600	—	P G	—	United States of America
Wyandotte WCO ^{9 131}	150	300, 600	Wyandotte Transportation Co., Detroit (Mich.)	P G	—	United States of America
Wyandotte WJW ⁹⁷	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	P G	—	Australian Commonwealth
Wyandra ¹	240	300, 600	—	P G	—	—
Wye Crag ¹⁹	150	300, 600	—	P G	—	Great Britain
Wye Tempest ¹⁹	150	300, 600	—	P G	—	Great Britain
Wye Valley ¹⁹	—	300, 600	—	P G	—	Great Britain
Wyncote ¹⁹	190	300, 600	—	P G	—	Great Britain
Wyneric ¹⁹	200	300, 600	—	P G	—	Great Britain
Wynooche ^{9 131}	300	300, 600	U.S. Shipping Board, Washington (D.C.)	P G	—	United States of America
Wyola ¹	150	300, 600	—	P G	—	Australian Commonwealth
Wyoming ⁹⁹	—	300, 600	Navy	P G	—	United States of America
Wyreema ¹	200	300, 600	—	P G	—	Australian Commonwealth
Wytheville ^{9 131}	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	P G	—	United States of America
Xarifa ⁹⁹	—	300, 600	Navy	P G	—	United States of America
Yaona ⁹⁹	—	300, 600	Navy	P G	—	United States of America
Yadkin ^{9 131}	200	300, 600	U.S. Shipping Board, Washington (D.C.)	P G	—	United States of America
Yahagi ¹	—	—	Navy	O	—	Japan
Yaka ¹⁰³	300	300, 450, 600	U.S. Shipping Board, Washington (D.C.)	P G	—	United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Yaklok ¹⁰⁸	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America.
Yakumo ¹	JRC	—	Navy	—	O ..	—	—	—	Japan
Yakumo Maru ¹	JYS	400	Osaka Shosen Kaisha (Osaka Mercantile Steamship Company)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yale ¹⁰¹	WRY	300	Harvard-Yale Syndicate	300, 600	P G ..	N	0.40	—	United States of America
Yalza ⁹⁷	KDJR	300	U.S. Shipping Board, Washington (D.C.)	300, 600 , 1,800	P G ..	X	0.40	—	United States of America
Yamacraw ²	NRY	200	U.S. Coast Guard Treasury Dept., Washington (D.C.)	600 , 752, 952	P G ..	N	0.20	—	United States of America
Yamagata Maru ¹	JCP	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yamashiro ¹	JGO	—	Navy	—	O ..	—	—	—	Japan
Yamashiro Maru ¹	JQOA	200	Nippon Yusen Kaisha (Japan Mail S.S. Company)	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yamato ¹	JUX	—	Navy	—	O ..	—	—	—	Japan
Yandiola ¹	CXY	150	Compania Naviei Guipuzcoana, San Sebastian	300, 600	P G ..	N	0.30	3.00	Spain
Yang Tze ²¹	ZKO	—	Operated by A. Holt & Co., Managers, Liverpool	300, 450, 600	P G ..	X	0.40	—	Great Britain
Yankallila ³	VHV	300	—	300, 600	P G ..	0900 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030	0.20 ⁸ 0.40 ⁵	—	Australian Commonwealth

Yankee Arrow	KJUG	Standard Transportation Company, 36, Broadway, New York (N.Y.)	Yarrow	PG	United States of America
Yankton	KDWT	Alexander A. Tanes	—	PG	United States of America
Yapalaga ^{9 13}	KDWH	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	PG	Cuba
Yara	PWK	Navy	—	—	United States of America
Yarborough NUMC ⁹⁹	NUMC	Navy	300, 600	PG	Great Britain
Yarborough YLM ¹⁰	YLM	—	300, 600	PG	Germany
Yargis ³⁵	DGS	—	300, 600	PG	Great Britain
Yarmouth	GEKD	Navy	—	PG	United States of America
Yarnall ⁹⁹	NGS	Navy	300, 600	PG	Great Britain
Yaroslavl ⁷¹	ZOK	—	300, 600	PG	Australian Commonwealth
Yarra GACS	GACS	Navy	—	—	Norway
Yarra LFW ¹	LFW	(Armateurs) den Norske Afrika-og Australielinje (Wilh. Wilhelm- sen Tønsberg)	300, 600	PG	Australian Commonwealth
Yarra VXS ³	VXS	—	300, 600	PG	Great Britain
Yarrow ¹⁹	GFJV	—	300, 450, 600	PG	Japan
Yawata Maru ¹	JYD	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	PG	Japan
Yave Maru ¹	JAE	Kokusai Kisen Kaisha	300, 600	PG	Japan
Yayoi Maru ¹	JYI	Kokusai Kisen Kaisha	300, 600	PG	Japan
Yeboshi Maru ¹	JHO	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	PG	Sweden
Yeddo ¹	SHF	Arkheologiet Svenska Ostasiatiska Kompaniet, Gothenburg, Sweden East Asia Co.	300, 600	P	Japan
Yehime Maru ¹	JAX	Yamashita Kisen (Kabushiki), Kaisha	300, 600, 1,800	PG	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radio-telegram.	
Yefuku Maru ¹ ..	JFG	400	Kokusai Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700	0.40	—	Japan
Yeikoku Maru ¹ ..	JII	400	Taiyo Kisen Kaisha ..	300, 600	P ³⁵ ..	2000 to 2400 0800 to 1100	—	—	Japan
Yeifu Maru ¹ ..	JCT	400	Katsuda Kisen (Kabushiki) Kaisha	300, 600	P G ..	1400 to 1700 2000 to 2400 0800 to 1100	0.40	—	Japan
Yeovil ..	GFOJ	—	Navy ..	—	P G ..	1400 to 1700 2000 to 2400	—	—	Great Britain
Yesaki Maru ¹ ..	JEQ	400	Kokusai Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700	0.40	—	Japan
Yesoking ²⁷ ..	KERQ	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	2000 to 2400 X	0.40	—	United States of America
Yotorofu Maru ¹ ..	JBIA	400	Kobe Shosen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700	0.40	—	Japan
Yildum ¹ ..	PXM	200	Van Nievelt Goudriaan en Co.'s, Stoomvaart Maatschappij, Rotterdam	300, 450, 600, 800	P G ..	2000 to 2400 X	0.40	4.00	Holland
Ying Swei ..	XSF	—	Navy ..	—	O ..	—	—	—	China
Ymir ³⁵ ..	DYI	200	—	300, 450, 600	P G ..	X	0.40	4.00	Germany
Yngaren ¹ ..	SHP	250	Roderiktskebolaget Transatlantic, Gothenburg	300, 600	P ..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400 (local mean time)	0.40	4.00	Sweden
Yorona ¹⁰ ..	NUNB	—	—	300, 600	P G ..	N	—	—	United States of America
Yodo ¹ ..	JWC	—	Navy ..	—	O ..	—	—	—	Japan

Yokohama Maru ¹	JYH	400	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yoko Maru ¹	JAB	400	Taiyo Kisen Kaisha	300, 600	P G	2000 X	0.40	United States of America
Yomachichi ⁸⁷	WPAI	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yomei Maru ¹	JIX	400	Taiyo Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yonan Maru ¹	JNC	400	Taiyo Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yone Maru ¹	JIW	400	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Great Britain
Yonne ¹⁹	ZWV	180	—	300, 600	P G	2000 X	0.40	United States of America
Yorba Linda ¹⁰³	KDNS	200	General Petroleum Corporation, 310, Sansome St., San Francisco (Cal.)	300, 600, 1,800	P G	X	0.40	United States of America
York Castle ¹⁹	ERC	—	—	300, 600	P G	N	0.40	Great Britain
York City ¹⁹	GJCK	—	—	300, 450, 600	P G	X	0.40	Great Britain
York Harbor ¹⁰³	KOJB	—	U.S. Shipping Board, Washington (D.C.)	300, 600	P G	X	0.40	United States of America
Yorkshire ⁴⁰	GDKC	300	—	300, 450, 600	P G	N	0.40	Great Britain
Yoro ⁹	VY	—	Vaccaro Bros. & Co.	—	P G	X	0.40	Honduras (Repub.)
Yoro Maru No. 2 ¹	JEX	300	Kusakabe Kaisha	300, 600	P ³⁵	0800 to 1100 1400 to 1700 2000 to 2400	—	Japan
Yoroppa Maru ¹	JDLA	400	Hamane Shoten	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yosemite KDWE ⁸⁷	KDWE	200	Pope and Talbot	300, 600	P G	2000 X	0.40	United States of America
Yosemite KYS ^{9 131}	KYS	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G	X	0.40	United States of America
Yoseric ¹⁹	ZFN	—	—	300, 600	P G	X	0.40	Great Britain
Yoshida Maru No. 1 ¹	JIH	200	Yamashita Kisen, Kabushiki, Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yoshida Maru No. 3 ¹	JCY	400	Yamashita Kisen, Kabushiki, Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan
Yoshino Maru ¹	JOD	275	Nippon Yusen Kaisha (Japan Mail Steamship Company)	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	Japan

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Young ⁸⁹	..	—	Navy	300, 600	P G ..	N	0.20 III 0.40 III	—	United States of America
Youngtown ⁹⁷	..	300	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X	0.40	—	United States of America
Ypres Maru ¹	..	400	Teikoku Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yseldijk HDS ¹	..	200	Solleveld, Van der Meer en T. H. Van Hattum's, Stoomvaart	300, 600	P G ..	X	0.40	4.00	Holland
Yseldijk PIP ¹	..	200	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Yselhaven ¹	..	150	Maatschappij Stoomschip Yselhaven, Rotterdam	300, 600	P G ..	X	0.40	4.00	Holland
Yser FAY ¹	..	300	Société Générale D'Armement, Nantes	300, 600	P G ..	N	0.40	—	France
Yser FBYR	..	—	Navy	300, 800	P G ..	N	0.05	—	France
Yubae Maru ¹	..	400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yubari Maru ¹	..	400	Hokkaido Taniko Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100	0.40	—	Japan

Yucatan 103	WL5	439	Pier 13, East River, New York (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Yucita # 131	..	200	U.S. Shipping Board, Washington (D.C.)	—	O	—	—	—	China
Yu-Chang	..	—	Navy	—	P 25	0800 to 1100 1400 to 1700 2000 to 2400	—	—	Japan
Yugawo Maru 1	..	400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Yuki Maru 1	..	300	Tatsuuma Kisen Kabushiki Kaisha	300, 600	P G ..	—	—	—	United States of America
Yukon NAQD 102	..	—	—	300, 600	P G ..	N	—	—	United States of America
Yukon WXEU # 131	..	300	U.S. Shipping Board, Washington (D.C.)	300, 600	P G ..	N	0.40	—	United States of America
Yuma # 131	..	150	Di Giorgio Fruit Corporation	300, 600	P G ..	X	0.40	—	United States of America
Yung-Chion	..	—	Navy	—	O	—	—	—	China
Yung-Fung	..	—	Navy	—	O	—	—	—	China
Yung-Kien	..	—	Navy	—	O	—	—	—	China
Yung Tsih	..	—	Navy	—	O	—	—	—	China
Yura 1	..	—	Navy	—	O	—	—	—	Japan
Yuri Maru 1	..	400	Kakusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	Japan
Zaandijk HDH 1	..	200	Solleveld, Van der Meer en T. H. Van Hartum's Stoomvaart, Maatschappij	300, 600	P G ..	X	0.40	4.00	Holland
Zaandijk PIJ 1	..	150	Nederlandsche Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G ..	—	0.40	4.00	Holland

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Zaanland ¹	..	200	Koninklijke Hollandische Lloyd, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Zaanstroom ¹	..	200	Hollandische Stoomboot Maatschappij, Amsterdam	300, 600	P G ..	X	0.40	4.00	Holland
Zacapa ⁸⁸	..	500	United Fruit S.S. Corporation ..	300, 450, 600	P G ..	N	0.40	—	United States of America
Zaida ¹⁹	..	175	—	300, 600	P G ..	X	0.40	—	Great Britain
Zaire ⁹¹	..	100-150	Navy	300, 600	P G ..	N	0.40	4.00	Portugal
Zakynthos ¹	..	100-150	G. Vanoulatos Bros., Piræus	300, 600	P G ..	X	0.40	4.00	Greece
Zamora ¹⁹	..	130	—	300, 600	P G ..	X	0.40	—	Great Britain
Zane ⁹⁹	..	—	Navy	—	P G ..	N	0.20 111 0.40 112	—	United States of America
Zamos Sifneos ¹	..	100-150	Société Orientale des Transports	300, 600	P G ..	X	0.40	4.00	Greece
Zapora ⁹⁷	..	100	Booth, Pittsburgh	—	P G ..	X	0.40	4.00	Greece

Ship	Call	Frequency	Operator	Power	Class	Country	Remarks
Zara UVZ ¹⁷	..	UVZ	140	Brughera Riccardo, Genoa	300, 600	P G ..	X 0.40 — Italy
Zarembo ⁹⁷	..	KICS	200	U.S. Shipping Board, Washington (D.C.)	300, 450, 600	P G ..	X 0.40 — United States of America
Zaria ¹⁹	..	ZMP	160	—	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 X 0.40 — Great Britain
Zealand ¹⁹	..	MTX	120	—	300, 600	P G ..	1.50 ⁸² 0.15 ⁸² — Great Britain
Zealandia ¹	..	VJC	240	—	300, 600	P G ..	0.20 ⁸ 0.40 ⁵ — Australian Commonwealth
Zealandic ¹⁹	..	MUZ	240	—	300, 600	P G ..	0930 to 1030 1200 to 1300 1400 to 1430 1630 to 1730 2030 to 0030 (ship's time) X 0.40 — Great Britain
Zebu	..	FAZU	—	Navy	300, 800	P G ..	0.05 — France
Zeehond	..	PAZ	—	Navy	600	O ³⁹ ..	— — Holland
Zeeland PAF	..	PAF	—	Navy	600	O ³⁹ ..	— — Holland
Zeeland EZV ¹	..	PZV	150	Bureau Wismuller Scheepvaart Transport en Zeesleepvaart Maatschappij, The Hague	300, 600	P G ..	4.00 — Holland
Zeeland YYF ¹⁹	..	YYF	200	—	300, 450, 600, 2,000, 2,200	P G ..	0.40 — Great Britain
Zeelandia ¹	..	PEI	250	Koninklijke Hollandsche Lloyd, Amsterdam	300, 600	P G ..	4.00 — Holland
Zeeslang	..	PLB	60	Navy	300, 600	O ³⁹ ..	— — Dutch East Indies
Zeilin ⁹⁹	..	NUMB	—	Navy	300, 600	P G ..	0.20 ¹¹¹ 0.40 ¹¹² — United States of America

Shipboard Stations—Continued

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge, Francs.		Country.
							Per Word.	Minimum per Radiogram.	
Zeffiro ..	IJE	—	Navy	—	—	—	—	—	Italy
Zelo ⁵⁰ ..	GCLP	100	—	300, 450, 600	P G ..	X	0.10 ⁸⁷	1.00 ⁸⁷	Great Britain
Zelos ¹ ..	SMA	150	Rederiaktiebolaget Disa, Stockholm	300, 600	P ..	X	0.40	4.00	Sweden
Zernatt ¹⁹ ..	EUZ	140	—	300, 600	P G ..	X	0.40	—	Great Britain
Zenon ¹ ..	FSQ	250	Compagnie Generale Transatlantique, 6, Rue Auber, Paris	300, 600	P G ..	X	0.40	—	France
Zenson ..	IGU	—	Navy	—	—	—	—	—	Italy
Zent ¹⁹ ..	GDCW	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Zenteno ..	CAI	—	Navy	—	—	—	—	—	Chile
Zeta ¹ ..	LDR	150	(Armateurs) Det Bergenske Dampskibsselskab, Bergen	300, 450, 600	P G ..	X	0.40	4.00	Norway
Zeus ³⁵ ..	DZE	200	—	300, 600	P G ..	X	0.40	4.00	Germany
Zijldijk ¹ ..	TYF	200	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	300, 450, 600, 800	P G ..	X	0.40	4.00	Holland
Zilka ¹⁵ ..	PUZ	120	Companhia Brasileira de Cabotagem Limitada, Rio de Janeiro	300, 600	P G ..	N	0.40	—	Brazil
Zimorodok ..	YEX	160	—	300, 600	P G ..	X	0.40	—	Great Britain
Zinal ¹⁹ ..	GDJW	—	—	300, 600	P G ..	X	0.40	—	Great Britain
Zingara ¹⁹ ..	ZXA	135	—	300, 600	P G ..	X	0.40	—	Great Britain
Zinnia ¹ ..	OTN	150	—	300, 600	P G ..	X	0.40	—	Great Britain
Zirkel ¹⁰³ ..	WREO	—	State Navy Administration U.S. Shipping Board, Washington	300, 600	P G ..	N	0.40 ²	4.00 ²	Great Britain Belgium

Country	Line	Class	Capacity (Tons)	Company	Port of Origin	Port of Destination	Frequency	Remarks
Zambia				Commerce, Washington (D.C.)				
Zoppot ¹	DTZ	200	300, 600	Baltisch-Amerikanische Petroleum-Import-Gesellschaft, T.M.B.H., Zoppot	0.40	4.00	0.00 to 0.00	Danzig
Zosma ¹	OML	200	300, 450, 600, 800	Van Nievelt Goudriaan en Co.'s Stoomvaart Maatschappij, Rotterdam	0.40	4.00	X	Holland
Zovetto ¹⁷	IWK	190	300, 600	Parodi Angelo, Genoa	0.40	—	X	Italy
Zuiderdijk ¹	PHP	200	300, 450, 600, 800	Nederlandsche - Amerikaansche Stoomvaart Maatschappij, Holland-Amerika Lijn, Rotterdam	0.40	4.00	X	Holland
Zuid-Holland ¹	OMG	150	300, 600	Scheepvaart en Steenkolen Maatschappij, Rotterdam	0.40	4.00	X	Holland
Zulia ^{9 121}	KDZ	300	300, 450, 600	Atlantic and Caribbean Steam Navigation Redd Line, 82, Wall Street, New York (N.Y.)	0.40	—	N	United States of America
Zwarte Zee ¹	PID	125	300, 600	L. Smit & Co.'s, Sleepdienst, Rotterdam	0.40	4.00	X	Holland
Zwarte Zee ¹	PXT	200	300, 450, 600, 800	Naamlose Vennootschap S.S. "Zwarte Zee," Rotterdam	0.40	4.00	X	Holland
Zwulon ¹⁹	GBVR	—	300, 600	—	0.40	—	X	Great Britain

NOTES.

The accounts are settled by the Posts and Telegraphs Authorities.

The accounts are settled by the Posts and Telegraphs Authorities.
Operated and controlled by the owners.

² Operated and controlled by the owners.
³ Operated and controlled by the Amalgamated Wireless (Australasia), Ltd.

⁴ The accounts are settled by A. S. Patterson & Company, Auckland.

⁵ For radiotelegrams exchanged with coast stations controlled by all other

Also deals with public correspondence, subject to the consent of the captain

* Also deals with public correspondence, subject to the consent of the captain of the ship.

ne ship.
Steam-tug.

⁷ Steam-tug.
⁸ For radiotelegrams exchanged with coast stations controlled by Common-

For radioteleggrams exchanged with
the of Australia and New Zealand.
Operated by the Radio Corporation of America.

® Operated by the Radio Corporation of America.
 ® Operated by the Société Anonyme Internationale de Télégraphie Sans Fil.

¹¹ Ship engaged on cross Channel service between Dover and Belgium. Messages exchanged during crossings, either between the steamers and Antwerp or Ostend coast stations; or between two of the steamers on this service is applied. The charge per message is 3 fr. per radiotelegram of ten words or less, with 20 centimes for each additional word. Messages exchanged with North Foreland station, the ship charge is 10 centimes per word, minimum 1 fr.

ship charge is 10 centimes per word, minimum 1 fr.

12 Deals with special traffic through Calcutta Naugachaki.

11 The accounts are settled by the Société Indépendente Belge de Télégraphie

Sans Fil, 23, Boulevard de Waterloo, Brussels;

is Operated by the Marconi International Marine Communication Company,
Ltd London.

Ltd., London.
 Correspondence on behalf of the garrison only.

NOTES—continued

¹⁷ The accounts are settled by the Direction Generale des Services Electriques, Service des Telegraphes, 66 Bureau, Rome, for radiotelegrams exchanged with coast stations, and by the Compagnia Internazionale Marconi, per le Comunicazioni Marittime, via dei Condotti 11, Rome, for radiotelegrams exchanged with ship stations.

¹⁸ Fitted for reception only.

¹⁹ The accounts are settled by the Marconi International Marine Communication Company, Ltd., London.

²⁰ Accounts are settled by the Department of Marine and Fisheries, Ottawa, Ontario.

²¹ Operated by the Marconi Wireless Telegraph Company of Canada, Ltd., Montreal, P.Q.

²² The accounts are settled by the Atlantic Transportation Company, Ltd., Montreal, P.Q.

²³ The accounts are settled by the United Fruit Company, New Orleans.

²⁴ Operated by the Cutting & Washington Radio Corporation, 6 and 8, West 48th Street, New York.

²⁵ When the ship is trading in the Pacific Coast Service.

²⁶ When the ship is trading in the Atlantic Coast Service.

²⁷ See International Time Section of book, for Time of Watches.

²⁸ The accounts are settled by Hon. The Minister of Lands, Victoria, B.C.

²⁹ The accounts are settled by the Grand Trunk Pacific Steamship Company, Vancouver, B.C.

³⁰ The accounts are settled by the Independent Wireless Telegraph Company 42 Broadway, New York (N.Y.).

³¹ The accounts are settled by the Pacific Salvage Company, Victoria, B.C.

³² The accounts are settled by the Ship Owners' Radio Service, Inc.

³³ 0600 to 0800, 1000 to 1200, 1400 to 1600, 1800 to 1900 (Indian standard time, 5 hours, 30 minutes in advance of Greenwich mean time).

³⁴ The accounts are settled by G. P. D'Aigneaux, 24, Ste. Ursule St., Quebec (P.Q.).

³⁵ The station corresponds only with ships belonging to the same company.

³⁶ Correspondence limited to radiotelegrams exchanged with Reederei Behnke and Sieg or with their agents in different ports.

³⁷ Correspondence restricted to radiotelegrams exchanged with Chosen Light-house and Japanese warships.

³⁸ No ship charge.

³⁹ Public correspondence admitted without ship's charge when there is no official correspondence.

⁴⁰ The accounts are settled by the Direction des Télégraphes du Royaume de Danemark, Copenhagen, but accounts for radiotelegrams exchanged directly between ships are liquidated by the Dansk Radio Aktieselskab, Copenhagen.

⁴¹ The accounts are settled by the Yu Fong Steamship Company, 12, Ezra Road,

⁴² The accounts are settled by the Direction des Télégraphes du Royaume de Danemark, Copenhagen, but accounts for radiotelegrams exchanged directly between ships are liquidated by the Deutsche Betriebsgesellschaft für Drahtlose Telegraphie Hallesches Ufer 12-13, Berlin, S.W.11.

⁴³ This charge is reduced to 5 centimes for radiotelegrams exchanged with Leftonian coast stations.

⁴⁴ Operated by the Nederlandsche Radio-Telegraf Co., Amsterdam.—0400 to 0415, 0600 to 0800, 0900 to 1200, 1400 to 1500, 1700, to 1900, 2200 to 2300 (mean time of Java).

⁴⁵ Station temporarily closed.

⁴⁶ Ice-breaker.

⁴⁷ Station is open only during season of navigation (March and April).

⁴⁸ The station exchanges generally radiotelegrams relating to navigation.

⁴⁹ The accounts are settled by the owner.

⁵⁰ The accounts are settled by the Radio Communication Company, Ltd., 34-35, Norfolk Street, Strand, London.

⁵¹ Operated and controlled by the Marconi International Marine Communication Company, Ltd., London.

⁵² When the ship is trading in Fiji or Western Pacific waters.

⁵³ Ship engaged in a regular service between Calais and Dover.

⁵⁴ Ship engaged in a regular service between Dieppe and Newhaven.

⁵⁵ Ship engaged in a regular service between France and Algeria.

⁵⁶ Ship engaged in a regular service between France, Algeria and Tunis.

⁵⁷ Ship engaged in a regular service between France and Corsica.

⁵⁸ Ship engaged in a regular service between France, Corsica and Algeria.

⁵⁹ Ship engaged in a regular service between France and Corsica, Algeria and Tunis.

⁶⁰ Ship engaged in a regular service between France and Tunis.

⁶¹ Operated and controlled by the Société Anonyme Internationale de Télégraphie sans Fils, Brussels.

⁶² The ship charge, without regard to the nationality of the boats, is 14 centimes per word, minimum 1 fr. 40 centimes, for correspondence exchanged with Tralleberg Radio, and 18 centimes per word, minimum 1 fr. 80 centimes for correspondence exchanged with Sassnitz.

⁶³ The station is open the last 20 minutes of each hour, from 0740 to 1800 (local mean time).

⁶⁴ Transmits only radiotelegrams sent by the captain.

⁶⁵ From Dieppe to Newhaven: day service, 1300 to 1630, night service, 0100 to 0530; from Newhaven to Dieppe: day service, 1200 to 1530, night service, 2200 to 0230.

⁶⁶ The service of the Sassnitz-Tralleberg Line being performed alternately by German and Swedish ferry boats, it is necessary to replace the name of the ship station in the address of radiotelegrams by one of the following indications: Ferry Boat A for the boat leaving Sassnitz in the morning; Ferry Boat B for the boat leaving Tralleberg in the morning.

Steamship accounts are settled by the N. A. Long Steamship Company, by cable, through the ferry boats of the Sassnitz-Tralleborg Line. Official correspondence with Sassnitz and Tralleborg Radio and also with other ferry boats of the Sassnitz-Tralleborg Radio Line, concerning the railway traffic.

⁶⁹ Particular correspondence relating to the service of the ship.

⁷⁰ Public correspondence is with Constanza Tunnel only.

⁷¹ The accounts for radiotelegrams sent through coast stations are settled by the Comptroller and Accountant-General, General Post Office, London; but accounts for radiotelegrams exchanged directly between ships should be sent to the office, company, etc., who operate the station.

⁷² 0800 to 1100, 1400 to 1500, 1900 to 2200; the station also listens out during the first ten minutes of each hour.

⁷³ Public correspondence restricted to urgent messages relating to navigation.

⁷⁴ Common call for submarines of O type in the Royal Marine.

⁷⁵ Common call for auxiliary ships of the Royal Marine; when necessary followed by the number or name of particular ship.

⁷⁶ Common call for minesweepers of the Royal Marine; when necessary followed by the vessel's number.

⁷⁷ Two motor lifeboats equipped with wireless telegraphy apparatus are carried by this ship.

⁷⁸ Public correspondence only with other vessels of the Zealand Co., or the coast stations Schevenique-Port and North Foreland Radio.

⁷⁹ For restricted service (see not ⁷⁸) the total charge for messages is 40 centimes per word, minimum 4 francs. For messages sent via North Foreland Radio an additional charge of 17 centimes a word, minimum 1 franc 70 centimes, is made for messages for the U.K. via North Foreland Radio, the coast station charge and the inland rate must be added.

⁸⁰ Common call sign for torpedo boats of the marine service.

⁸¹ In the case of radiotelegrams transmitted through North Foreland Radio, the coast charge is 17 centimes per word, minimum 1 franc 70 centimes. For radiotelegrams forwarded for the U.K., however, a charge is made, in addition to the ship charge, of 28 centimes per word, minimum 2 francs 80 centimes, representing the coast charge of North Foreland Radio and the inland wire charge.

⁸² In the case of radiotelegrams exchanged with coast stations of the United Kingdom the coast charge is 17 centimes per word, minimum 1 franc 70 centimes. In the case of radiotelegrams exchanged with French coast stations, the coast charge is 15 centimes per word, without a minimum.

⁸³ Public correspondence restricted to radiotelegrams exchanged by the steamers of the Zealand Company, between themselves and with the Schevenique-Port and North Foreland Radio coast stations. When, however, on special occasions, the ship departs from the normal route, the station conducts general public correspondence.

Maatschappij "Zeeland". For these messages the ship charge is 10 centimes per word, minimum 1 franc, in respect of each ship station. In the case of radiotelegrams transmitted through North Foreland Radio the coast charge is 17 centimes a word, minimum 1 franc 70 centimes. For radiotelegrams intended for the United Kingdom, however, a charge is made of 28 centimes per word, minimum 2 francs 80 centimes, representing the coast charge of North Foreland Radio and the inland wire charge.

⁸⁵ Normally corresponds only with other vessels of the Batavier Line or with the coast stations, North Foreland Radio and Schevenique-Port.

⁸⁶ This call signal applies to any or all of the submarines of the type K in the Royal Navy; it is followed when necessary by the number of a particular submarine.

⁸⁷ In the case of radiotelegrams exchanged with coast stations of the United Kingdom, the coast charge is 33 centimes per word, minimum 3 francs 30 centimes.

⁸⁸ In the case of radiotelegrams exchanged with the Tobago and Trinidad coast stations, the ship charge is reduced to 5 centimes per word with a minimum of 50 centimes, and the coast charge is reduced to 15 centimes per word, with a minimum of 1 franc 50 centimes.

⁸⁹ A motor lifeboat equipped with wireless telegraph apparatus is carried by this ship.

⁹⁰ Operated by the Compagnie Française Maritime et Coloniale de Télégraphie sans Fils, Paris, on behalf of the Marconi International Marine Communication Company, Ltd., London.

⁹¹ The ship charge is reduced to 20 centimes per word for messages exchanged with Australian and New Zealand coast and ship stations.

⁹² While engaged exclusively in Lyttleton-Wellington ferry service.

⁹³ In addition to official correspondence the station accepts private radiotelegrams for the officers and crew of the ship.

⁹⁴ Operated by Einiskipafjelag Islands, Reykjavik.

⁹⁵ When on trip to Alaska and return.

⁹⁶ When stationed in Alaskan waters.

⁹⁷ Operated by the Ship Owners' Radio Service, 149, Broadway, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

⁹⁸ Operated by the Tropical Radio Telegraph Company, 17, Battery Place, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

⁹⁹ Operated by the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰⁰ The accounts are settled by the Wireless Service Company, through the U.S. Naval Communication Navy Dept., Washington (D.C.), in the absence of special agreements.

NOTES—continued

¹⁰¹ Operated by the Federal Telegraph Company, Hobart Building, San Francisco (Cal.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰² The accounts are settled by the U.S. Navy, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰³ Operated by the Independent Wireless Telegraph Company, 42, Broadway, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰⁴ Operated by the International Radio Telegraph Company, 326, Broadway, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰⁵ When carrying passengers.

¹⁰⁶ When not carrying passengers.

¹⁰⁷ The accounts are settled by the Philippine Insular Government, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰⁸ The accounts are settled by the Vacuum Oil Company, 61, Broadway, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹⁰⁹ The accounts are settled by the Tide Water Oil Company, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹¹⁰ The accounts are settled by the United States Steel Products Company, 30 Church St., New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹¹¹ When the ship is trading in the North and South American service.

¹¹² When the ship is trading in the transoceanic service.

¹¹³ Operated by the Transmarine Corporation, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹¹⁴ The accounts are settled by the Cutting & Washington Radio Corporation, 6-8, West 48th St., New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹¹⁵ The station sends daily to the Branch Hydrographic, New York City, at 0400 (time of the meridian 75° West of Greenwich), a report concerning the ice fields in the vicinity of the Grand Banks of Newfoundland. The top information is given in plain English and states the following:—*a*, ice (berg or field), *b*, date, *c*, time (meridian 75° West of Greenwich), *d*, latitude, *e*, longitude, *f*, other data as may be necessary.

¹¹⁶ This charge is reduced to 10 centimes per word when the ship is trading in the Great Lakes service.

¹¹⁷ No charge is made for relaying messages.

¹¹⁸ The relaying rate is 20 centimes per word.

¹¹⁹ When the ship is trading in the Great Lakes service.

¹²⁰ The accounts are settled by the Standard Oil Company of N.J., Incorn.

¹²¹ The accounts are settled by the Panama R.R. Company, 24, State St., New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹²² Transoceanic service, no rates.

¹²³ The accounts are settled by the Moore & McCormack Company, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹²⁴ This charge is reduced to 5 centimes when the ship is trading between East San Pedro and Avalon (Cal.).

¹²⁵ The accounts are settled by the Inland and Coastwise Waterways Service, War Dept., through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹²⁶ The accounts are settled by the U.S. Coast Guard, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹²⁷ While on voyages from San Francisco to Kvichak (Alaska) and return, the station is P.G. When stationed in Alaskan waters, the ship is P.R. When P.R. the station corresponds only with the ship stations Nushagak, Kenak, Star of Holland, Star of Greenland, Star of Lapland and the land stations Decharof (Alaska), Snag Point, Clark's Point, Kvichak, Naknek KHT, Uyak (Alaska), Karuk, Altaiak, Chignik KHC, Kusliof and Pilot Point (Alaska).

¹²⁸ While on voyages from San Francisco to Kvichak (Alaska) and return, the station is N. when stationed in Alaskan waters the station is X.

¹²⁹ While on voyages from San Francisco to Kvichak (Alaska) and return, the station is P.G. When stationed in Alaskan waters, the ship is P.R. When P.R. the station corresponds only with the ship stations Kenak, Star of Holland, Star of Greenland, Star of Lapland, and the land stations Decharof (Alaska), Snag Point, Clark's Point, Kvichak, Naknek KHT, Uyak (Alaska), Karuk, Altaiak, Chignik KHC, Kusliof and Pilot Point (Alaska).

¹³⁰ The accounts are settled by the Union Oil Company, through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹³¹ The general call signal WAAA has been assigned for all vessels operated and controlled by the Radio Corporation of America. This general call signal will be used by Radio Corporation of America, ships or coast stations desiring to ascertain whether there is an R.C.A. ship within range, and any R.C.A. vessel hearing another ship or coast station calling WAAA, should answer. Also this general call signal will be used in broadcasting messages to R.C.A. ships.

¹³² The accounts are settled by the Radio Supervisor, U.S. Shipping Board, Norfolk, Virginia.

¹³³ The accounts are settled by the U.S. Army through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹³⁴ The accounts are settled by the United American Lines, 39, Broadway, New York (N.Y.), through the U.S. Naval Communication Service, Navy Dept., Washington (D.C.), in the absence of special agreements.

¹³⁵ The accounts are settled by the U.S. Coast and Geodetic Survey, through

AIR STATIONS.

AIR STATIONS.

Name.	Call Signal.	Normal Range in Nautical Miles.	Aircraft Line or Aircraft Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Aircraft Charge, Francs.		Country.
							Per Word.	Minimum per Radiotelegram.	
Angelo Berardi ¹	IXAAA	—	—	600	—	—	—	—	Italy
A.T.10 ⁴	FAIB	100	—	600, 800	P G	N	0.05	—	France
A.T.12 ⁴	FAIC	100	—	600, 800	P G	N	0.05	—	France
A.T.14 ⁴	FAID	100	—	600, 800	P G	N	0.05	—	France
A.T.15	FAIL	100	—	600, 800	P G	N	0.05	—	France
A.T.16 ⁴	FAIM	100	—	600, 800	P G	N	0.05	—	France
A.T.20 ⁴	FAIT	100	—	600, 800	P G	N	0.05	—	France
Dixmude	FAPB	100	—	600, 800	P G	N	0.05	—	France
F.6 ²	ISAAG	—	—	600	—	—	—	—	Italy
FAEBY (Goliath)	FAEBY	—	—	—	—	—	—	—	France
FAECB (Goliath)	FAECB	—	Messageries Aérienne	—	—	—	—	—	France
FAECU (Goliath)	FAECU	—	Messageries Aérienne	—	—	—	—	—	France
FADDS (Goliath)	FADDS	—	Grand Express	—	—	—	—	—	France
FADDT (Goliath)	FADDT	—	Grand Express	—	—	—	—	—	France
FABDL (Goliath)	FABDL	—	Messageries Aérienne	—	—	—	—	—	France
FGEAC (Goliath)	FGEAC	—	Grand Express	—	—	—	—	—	France
GEA (General call of any British aircraft station)	GEA	—	—	—	—	—	—	—	Great Britain
GEAAB	GEAAB	—	I.C.W.	900, 600	— ⁶	—	—	—	Great Britain
GEAPJ	GEAPJ	—	I.C.W.	900, 600	— ⁶	—	—	—	Great Britain
GEARO	GEARO	—	I.C.W.	900, 600	— ⁶	—	—	—	Great Britain
GEASI Vimy (10 Seater Bristol)	GEASI	—	Instone Air Line	900, 600	— ⁶	—	—	—	Great Britain
GEATH (o/400)	GEATH	—	Handley Page Transport Company	900, 600	— ⁶	—	—	—	Great Britain
GEATK	GEATK	—	Handley Page Transport Company	900, 600	— ⁶	—	—	—	Great Britain
GEAWO	GEAWO	—	I.C.W.	900, 600	— ⁶	—	—	—	Great Britain
GEAWW (D.H.18)	GEAWW	—	Instone Air Line	900, 600	— ⁶	—	—	—	Great Britain
GEAWY Vimy 10 Seater	GEAWY	—	Instone Air Line	900, 600	— ⁶	—	—	—	Great Britain

[illegible]

⁵ This call signal applies to any or all of the aeroplanes of the Royal Navy; it followed when necessary by the number of a particular aeroplane.

^e Correspondence restricted to messages respecting the safety or navigation of the aircraft.

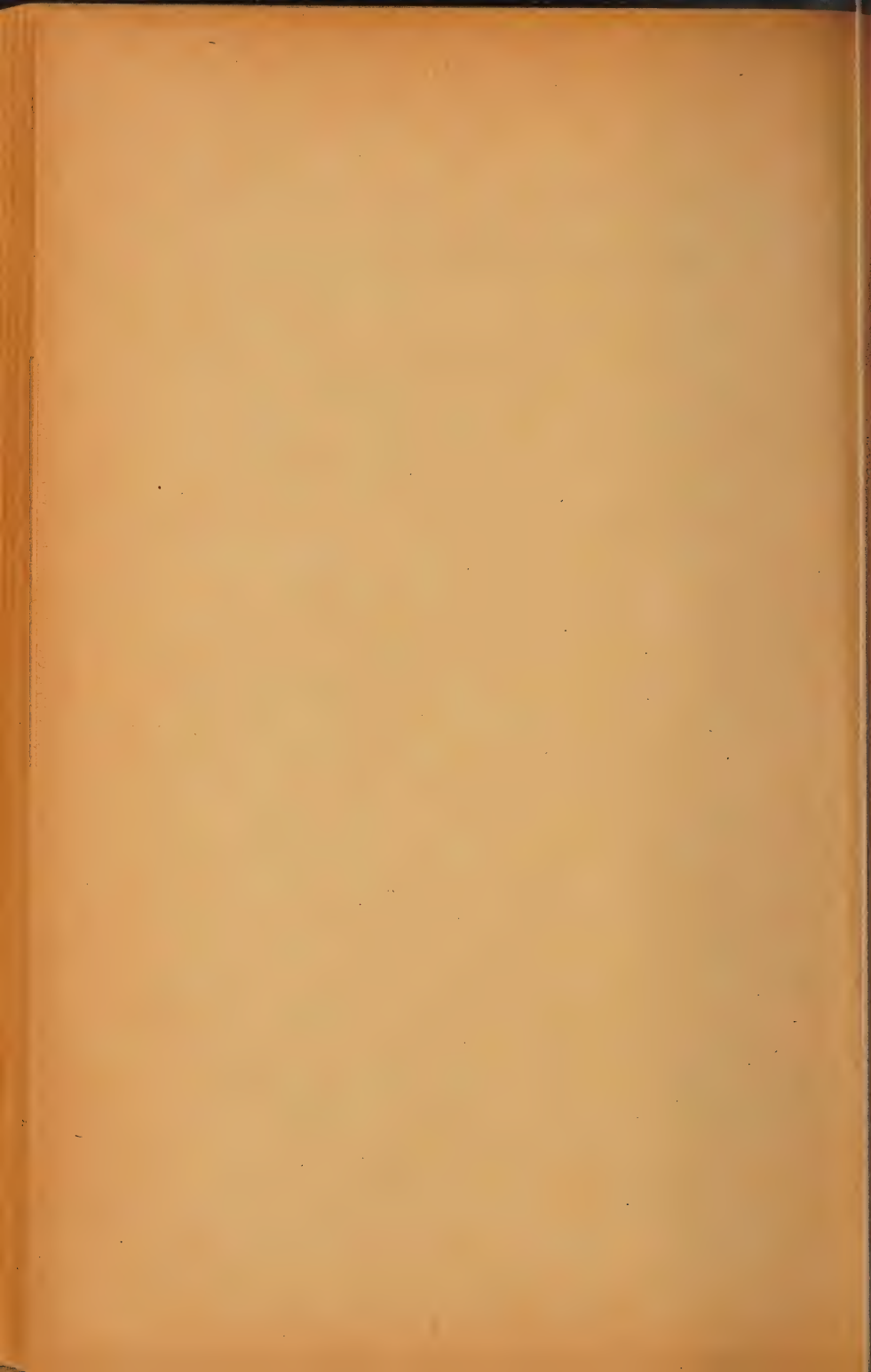
⁷ Public correspondence may be admitted, without ship charge, if there is no official correspondence.

Operated by the Ministry of War;

Operated by the Ministry of Commerce.

Operated by the
Commanded by the Inspectorate of the Royal Naval Air Service.

Dirigible balloon of the French Navy.



INTERNATIONAL CALL LETTERS

The International Bureau has allotted to signatories of the Convention a list of combinations of letters to be used as call signals for stations proper to the respective countries. The letter limitations of these lists are given in this section, together with the names of countries with which they are connected.

AAA to AMZ	Germany.	OAA to OBZ	Peru.
ANA to APZ	Netherland Indies.	OCA to OFZ	Great Britain.
AQA to AWZ	Norway.	OGA to OIZ	Denmark.
AXA to AXZ	Poland.	OJA to OJZ	Finland.
AYA to AYZ	Venezuela.	OKA to OKZ	Czecho-Slovakia.
AZA to AZZ		OLA to OMZ	Holland.
B	Great Britain.	ONA to OTZ	Belgium and Colonies.
CAA to CEZ	Chili.	OUA to OZZ	Denmark.
CFA to CKZ	British Possessions and Protectorates.	PAA to PIZ	Holland. (Home).
CLA to CMZ	Spain.	PJA to PJM	Curaçao.
CNA to CNZ	Morocco.	PJN to PJZ	Surinam.
COA to COZ	Great Britain.	PKA to PMZ	Netherland Indies.
CPA to CPZ	Bolivia.	PNA to PPZ	Brazil.
CQA to CQZ	Monaco.	PQA to PSZ	Portugal.
CRA to CRZ	Portuguese Colonies.	PTA to PVZ	Brazil.
CSA to CUZ	Portugal.	PWA to PWZ	Cuba.
CVA to CVZ	Roumania.	PXA to PZZ	Holland. (Home).
CWA to CWZ	Uruguay.	Q	<i>Reserved for abbreviations.</i>
CXA to CXZ	Spain.	RAA to RQZ	Russia.
CYA to CZZ	Mexico.	RRA to RZZ	
DAA to DSZ	Germany.	SAA to SMZ	Sweden.
DTA to DTZ	Danzig (Free Town of).	SNA to STZ	Brazil.
DUA to DZZ	Germany.	SUA to SUZ	Egypt.
EAA to EHZ	Spain and Colonies.	SVA to SZZ	Greece.
EIA to EZZ	Great Britain.	TAA to TEZ	Turkey.
F	French Colonies and Protectorates.	TFA to TFF	Ireland.
G	Great Britain.	TGA to THZ	Greece.
HAA to HAZ	Hungary.	TIA to TOZ	Spain.
HBA to HBZ	Switzerland.	TPA to TUZ	Norway.
HCA to HCZ	Ecuador.	TVA to TZZ	Holland.
HDA to HEZ	Holland.	UAA to UMZ	France and Colonies and Protectorates
HFA to HFZ	Serbs, Croates and Slovenes (Kingdom of).	UNA to UNZ	Serbs, Croates and Slovenes (Kingdom of).
HGA to HHZ	Siam.	UOA to UOZ	Austria.
HIA to HIZ	Dominican Republic.	UPA to UZZ	Italy.
HJA to HKZ	Columbia (Republic of).	VAA to VGZ	Canada.
HLA to HNU	Spain.	VHA to VKZ	Australian Commonwealth
HNV to HNZ	New Hebrides.	VLA to VMZ	New Zealand.
HOA to HZZ	France and Colonies and Protectorates.	VNA to VNZ	Union of South Africa.
I	Italy and Colonies.	VOA to VOZ	Newfoundland.
J	Japan and Colonies.	VPA to VSZ	British Colonies and Protectorates without autonomous Government
KAA to KAY	Germany.	UTA to UVZ	British Indies and Persian Gulf.
KAZ	Danzig (Free Town of).	VXA to VZZ	British Colonies and Protectorates.
KBA to KBZ	Germany.	W	U.S.A.
KCA to KCZ	Lettonia (Latvia).	XAA to XDZ	Mexico.
KDA to KZZ	U.S.A.	XEA to XMZ	Great Britain.
LAA to LAZ	Norway.	XNA to XSZ	China.
LIA to LRZ	Argentine Republic.	XTA to XZZ	Great Britain
LSA to LUZ	Great Britain.	Y	Great Britain
LVA to LVZ	Guatemala.	Z	Great Britain.
LWA to LWZ	Norway.		
LXA to LZZ	Bulgaria.		
M	Great Britain.		
N	U.S.A.		

CALL LETTERS

ALLOTTED TO LAND, SHIPBOARD AND AIRCRAFT STATIONS

The list of call letters of the stations, land, shipboard and aircraft of the world have been arranged alphabetically; ready reference is obtained to the class and particulars of any station by means of the indications in the third column which, if a shipboard or aircraft station, has ship or air therein, and if a land station the country in which it is situated.

B	Baracoa ...	Cuba	AHV	Hannover ...	Ship
C	Chala ...	Peru	AHX	Wasserfahrzeug	
L	Ilo ...	Peru		W.4 ...	Ship
M	Habana ...	Cuba	AHY	Wasserfahrzeug	
P	Isla de Pinos ...	Cuba		W.5 ...	Ship
P	Pisco ...	Peru	AIB	M.60 ...	Ship
X	Limon ...	Costa Rica	AIC	M.61 ...	Ship
Z	San Christobal	Peru	AIE	M.66 ...	Ship
AM	St. Inglevert ...	France	AII	M.72 ...	Ship
AN	Nîmes ...	France	AIL	M.75 ...	Ship
AAL	Vossclapp ...	Ship	AIR	M.81 ...	Ship
AAM	Amazona AAM	Ship	AIS	M.82 ...	Ship
AAR	Arkona ...	Ship	AIT	M.84 ...	Ship
ABE	Berlin ABE	Ship	AIU	M.85 ...	Ship
ACA	Aldershot ...	G. B.	AIY	M.89 ...	Ship
ACI	M.28 ...	Ship	AJB	S.19 AJB	Ship
ACR	M.46 ...	Ship	AJE	M.98 ...	Ship
ACT	M.50 ...	Ship	AJI	M.102 ...	Ship
ACY	M.57 ...	Ship	AJK	M.104 ...	Ship
ADA	Drache ...	Ship	AJN	M.107 ...	Ship
ADC	Delphin ADC ...	Ship	AJO	M.108 ...	Ship
ADQ	D.10 ...	Ship	AJP	M.109 ...	Ship
AEA	S.23 AEA ...	Ship	AJQ	M.110 ...	Ship
AEL	Elsass ...	Ship	AJR	M.111 ...	Ship
AEM	Peilboot IV ...	Ship	AJT	M.113 ...	Ship
ABO	Peilboot III ...	Ship	AJU	M.115 ...	Ship
AEP	Peilboot VII ...	Ship	AJW	M.117 ...	Ship
AFA	T.149 ...	Ship	AKC	M.122 ...	Ship
AFB	T.151 ...	Ship	AKE	M.126 ...	Ship
AFC	T.152 ...	Ship	AKF	M.129 ...	Ship
AFD	T.153 ...	Ship	AKG	M.130 ...	Ship
AFE	T.154 ...	Ship	AKH	M.132 ...	Ship
AFG	T.156 ...	Ship	AKJ	Niobe ...	Ship
AFH	T.157 ...	Ship	AKK	M.133 ...	Ship
AFI	T.158 ...	Ship	AKL	M.134 ...	Ship
AFK	T.168 ...	Ship	AKM	M.135 ...	Ship
AFM	T.175 ...	Ship	AKO	M.136 ...	Ship
AFN	T.185 ...	Ship	AKQ	M.138 ...	Ship
AFO	T.190 ...	Ship	AKR	M.145 ...	Ship
AFP	T.196 ...	Ship	AKR	M.146 ...	Ship
AFQ	V.1 AFQ ...	Ship	AKS	Akobo ...	Sudan
AFR	V.2 AFR ...	Ship	AKT	Rüstringen	Ship
AFS	V.3 AFS ...	Ship	AKV	M.157 ...	Ship
AFT	V.5 AFT ...	Ship	AKX	G.7 ...	Ship
AFU	V.6 AFU ...	Ship	AKY	Thetis AKX	Ship
AFV	Fuchs ...	Ship	AKZ	Nymphe ...	Ship
AFW	G.8 ...	Ship	ALE	Panther ...	Ship
AFX	G.10 ...	Ship	ALO	Pfeil ...	Ship
AFY	G.11 ...	Ship	ALQ	Lothringen	Ship
AFZ	S.18 AFZ ...	Ship	ALS	T.139 ...	Ship
AHA	Wollin ...	Ship	ALU	T.141 ...	Ship
AHE	Hessen ...	Ship	ALV	T.143 ...	Ship
AHM	Hamburg AHM	Ship	ALX	T.144 ...	Ship
AHP	Hay ...	Ship		T.146 ...	Ship

ALZ	T.148 ...	Ship	AQAN	Meteor AQAN	Ship
AMB	Preussen AMB	Ship	AQAO	Paris AQAO ...	Ship
AMC	Schlesien AMC	Ship	AQAP	Velloy ...	Ship
AMD	Medusa AMD	Ship	AQAO	Bogen ...	Ship
AME	Schleswig-Holstein ...	Ship	AQAR	Fjeldland ...	Ship
AMF	Nordsee ...	Ship	AQAS	Biarritz AQAS	Ship
AMG	Sonderburg ...	Ship	AQAT	John Blumer ...	Ship
AMH	Boreas AMH ...	Ship	AQAU	Roldal Amundsen	Ship
AMI	Jade ...	Ship	AQAX	Tiradentes	
AMJ	Norder ...	Ship	AQAY	AQAX ...	Ship
AMK	Brösen ...	Ship	ARA	Albr. W. Selmer	Ship
AMM	Mellum ...	Ship	ARB	Borghild ...	Ship
AMR	Meteor AMR ...	Ship	ARC	Rolf Jarl ...	Ship
ANK	Reael ...	Ship	ARE	Ovre ...	Ship
ANM	Maetsuycker ...	Ship	ARG	Stiklestad ...	Ship
ANT	Van Swoll ...	Ship	ARH	Tune ...	Ship
ANW	Van Noort ...	Ship	ARI	Seirstad ...	Ship
AOB	Duymaer van Twist	Ship	ARJ	Lisbeth ...	Ship
AOD	Van Riemsdyk	Ship	ARL	Storaker ...	Ship
AOF	De Klerk ...	Ship	ARM	Montana ARL	Ship
AOI	Rochussen ...	Ship	ARN	Loustakken ...	Ship
AOT	California AOT	Ship	ARO	Tizoni ...	Ship
AOV	Unio ...	Ship	ARP	Torrey ...	Ship
APA	Albatros APA	Ship	ARQ	M. H. Kongs-	
APB	Van Gogh ...	Ship	ARR	havn ...	Ship
APC	Assahan ...	Ship	ARS	Bjorneffjord ...	Ship
APE	Eridanus ...	Ship	ART	Skolma ...	Ship
APG	Gemma APG	Ship	ARU	Einar Jarl ...	Ship
APO	Orion APO ...	Ship	ARV	Ragnvald Jarl	Ship
APS	Serdang ...	Ship	ARW	Bueland ...	Ship
AQA	Nordnaes ...	Ship	ARX	Cleveland ARV	Ship
AQB	Hjortnaes ...	Ship	ARY	Maud ARW ...	Ship
AQC	Frey ...	Ship	ARZ	Carmen ARX ...	Ship
AQD	Liv. ...	Ship	ASA	Caballero ...	Ship
AQE	Freden ...	Ship	ASB	Melderskin ...	Ship
AQF	Askeladden ...	Ship	ASC	Sarpen ASA ...	Ship
AQG	Thor I ...	Ship	ASD	Topdalsfjord ...	Ship
AQH	Certo ...	Ship	ASE	Idefjord ...	Ship
AQI	Vestland ...	Ship	ASF	Bergsdalen ...	Ship
AQJ	Haugland ...	Ship	ASG	Skrymer ...	Ship
AQL	Holmborg ...	Ship	ASH	Olaf Kyrre ...	Ship
AQM	Dagfin ...	Ship	ASI	Karmøy ...	Ship
AQN	Mod ...	Ship	ASJ	Marita ...	Ship
AQO	Otto Sverdrup	Ship	ASK	Annavore ...	Ship
AQP	Jon Ludw		ASL	Belfri ...	Ship
AQQ	Mowinckel ...	Ship	ASM	Tordenskjold	
AQR	Solborg ...	Ship	ASN	ASK ...	Ship
AQS	Hendrik Lund	Ship	ASO	Talisman ...	Ship
AQT	Nordstrand ...	Ship	ASP	Wascana ...	Ship
AQW	Solvang ...	Ship	ASQ	Hektor ...	Ship
AQX	Tolosa AQT ...	Ship	ASR	EK ...	Ship
AQY	Inger Benedicte	Ship	ASS	Bolette... ..	Ship
AQZ	Wagland ...	Ship	AST	Tabor ...	Ship
AQAA	Spette ...	Ship	ASU	H. C. Flood ...	Ship
AQAB	Aslaug Haaland	Ship	ASV	Svane ...	Ship
AQAC	Enare ...	Ship	ASW	Hubro ...	Ship
AQAD	Erivan ...	Ship	ASX	Laura Skogland	
AQAE	Amauer Hansen	Ship	ASY	Boklund ...	Ship
AQAF	Pacific AQAD...	Ship	ASZ	Terne ...	Ship
AQAG	Eidshorn ...	Ship	ATA	Lifjeld ...	Ship
AQAH	Dagali ...	Ship	ATB	Tela ...	Ship
AQAI	Eidsvaag ...	Ship	ATC	Tricolor ...	Ship
AQAJ	Manto ...	Ship	ATD	Terrier ...	Ship
AQAK	Steinstad ...	Ship	ATE	Guernsey ...	Ship
AQAL	Frednes ...	Ship	ATF	Falk ...	Ship
AQAM	Etna AQAL ...	Ship	ATG	Cubano ...	Ship
	Troja ...	Ship		America ATE ...	Ship
				Svartfond ...	Ship
				Handicap ...	Ship

ATH	Skard ...	Ship	AVW	Forsete	Ship
ATI	Kapolna ...	Ship	AVX	Taurus AVX ...	Ship
ATJ	Gran ...	Ship	AVY	Herakles AVY	Ship
ATK	Asturias ...	Ship	AVZ	Arna ...	Ship
ATL	Haugarland ...	Ship	AWA	Jotunfjell ...	Ship
ATM	Alm ...	Ship	AWB	Orm Jarl ...	Ship
ATN	Modemi ...	Ship	AWC	Brann ...	Ship
ATO	Thomas Krag ...	Ship	AWE	Romsdalshorn ...	Ship
ATP	Songely ...	Ship	AWF	Tilthorn ...	Ship
ATQ	Proteus ATQ ...	Ship	AWG	Toluma ...	Ship
ATR	Havur ...	Ship	AWH	Frithjof I. ...	Ship
ATR	Atbara ...	Sudan	AWJ	Hesperos ...	Ship
ATS	Aladdin ...	Ship	AWK	Marvel ...	Ship
ATT	Aalesund ...	Ship	AWK	Kleobis ...	Ship
ATU	Konsa Olsen ...	Ship	AWL	Tennessee ...	Ship
ATV	Tugela ...	Ship	AWL	Langfjord ...	Ship
ATW	Christian Michel-		AWM	Mirlo ...	Ship
	sen ...	Ship	AWN	Solhaug ...	Ship
ATX	Leseps ...	Ship	AWO	Vindeggen ...	Ship
ATY	Kapirino ...	Ship	AWP	Borgholm ...	Ship
ATZ	Jacob Christen-		AWP	Antigone AWP	Ship
	sen ...	Ship	AWQ	S. Roch ...	Ship
AUA	Kapland ...	Ship	AWR	Halse ...	Ship
AUB	Gurth ...	Ship	AWS	Hallgyn ...	Ship
AUC	Condor AUC ...	Ship	AWT	Bell AWT ...	Ship
AUD	Alf ...	Ship	AWU	Devanger ...	Ship
AUE	Salonica AUE...	Ship	AWV	Thalatta ...	Ship
AUF	Basis ...	Ship	AWW	T. H. Skogland	Ship
AUG	Unita ...	Ship	AWX	Eidsbotten ...	Ship
AUH	Rutenfjell ...	Ship	AWY	Eda ...	Ship
AUI	Eldrid ...	Ship	AWZ	Esther-Elina ...	Ship
AUJ	Orla AUL ...	Ship	AXA	Komendant Pil-	
AUK	Mons ...	Ship		sudski ...	Ship
AUL	Klosterfos ...	Ship	AXB	General Haller	Ship
AUN	Edith Fische ...	Ship	AXC	Pomorzani ...	Ship
AUO	Aztec ...	Ship	AXD	Mysliwy ...	Ship
AUQ	Inneroy ...	Ship	AXE	Kaszub ...	Ship
AUR	Ringhorn ...	Ship	AXF	Kujawiak ...	Ship
AUS	Haukefjell ...	Ship	AXG	Krkowiak ...	Ship
AUT	Ravnefjell ...	Ship	AXH	Lnow ...	Ship
AUU	Marshall ...	Ship	AXI	Josef Pilsudski	Ship
AUV	Hellen ...	Ship	AYA	Caracas ...	Venezuela
AUW	Nordkyn ...	Ship	AYB	Maracay ...	Venezuela
AUX	Erviken ...	Ship	AYC	Puerto Cabello	Venezuela
AUY	Asborg ...	Ship	AYD	S. Cristobal ...	Venezuela
AUZ	Tiger AUZ ...	Ship	AYE	Porlamar ...	Venezuela
AVA	Skogland ...	Ship	AYF	Maracaybo ...	Venezuela
AVB	Nordhav ...	Ship	AYG	Guayra (La) ...	Venezuela
AVC	Ruth AVC ...	Ship	AYH	Barquisimeto ...	Venezuela
AVD	Romulus AVD	Ship	AZB	Lembit AZB ...	Ship
AVE	Hallgrim ...	Ship	AZC	Laene ...	Ship
AVF	Hundvaago ...	Ship	AZD	Lunnuk ...	Ship
AVG	Para AVG ...	Ship	AZE	Ellind ...	Ship
AVH	Sixtyfour ...	Ship	AZF	Wasa ...	Ship
AVI	Rodfjell ...	Ship	AZG	Gladiator AZG	Ship
AVJ	Gezina ...	Ship	AZH	Ahti ...	Ship
AVK	Gefion ...	Ship	AZJ	Kajak ...	Ship
AVL	Dampen ...	Ship	AZK	Kalevipoeg ...	Ship
AVM	Dampto ...	Ship	AZL	Lembit AZL ...	Ship
AVN	Valdemar Skog-		AZM	Meteor AZM ...	Ship
	land ...	Ship	AZN	Thorsten ...	Ship
AVO	Tana ...	Ship	AZV	Tartu ...	Ship
AVP	Harriet ...	Ship	AZW	Vambola ...	Ship
AVQ	Liss ...	Ship	AZY	Tasuja ...	Ship
AVR	Urød ...	Ship	BAA	Corbank ...	Ship
AVS	Thorsdall ...	Ship	BAB	Trevalgan ...	Ship
AVT	Geisha ...	Ship	BAH	Claymont ...	Ship
AVU	Remus AVU ...	Ship	BAM	Prairial ...	Ship
AVV	Sagaland ...	Ship	BAN	Sunray ...	Ship

BAR	Vitellia... ..	Ship	BFP	River Wye ...	Ship
BAS	Oreland ...	Ship	BFS	Gyp	Ship
BAU	Baron Inchcape ...	Ship	BFV	Frinton ...	Ship
BAV	Brussels ...	Belgium	BFX	Glenfinlas ...	Ship
BAW	Rio Preto ...	Ship	BGE	Bolingbroke ...	Ship
BBH	Butetown ...	Ship	BGH	Brookway ...	Ship
BBJ	City of Belfast ...	Ship	BGI	Nina BGI (La) ...	Ship
BBM	Mount Berwyn ...	Ship	BGK	Rio Negro BGK ...	Ship
BBO	Thamesmede ...	Ship	BGL	Gilwen Manor ...	Ship
BBQ	Leamington BBQ ...	Ship	BGN	Newbigging ...	Ship
BBV	Corcrest ...	Ship	BGP	Ulidia ...	Ship
BBW	Ripley Castle ...	Ship	BGQ	Crawford Castle ...	Ship
BBX	Milton ...	Ship	BGU	Rochdale ...	Ship
BCB	Greleden ...	Ship	BHC	Delambre ...	Ship
BCC	Blackhill ...	Ship	BHD	Jekri ...	Ship
BCD	City ...	Ship	BHF	Pilar de	
BCG	Commodore			Larrinaga ...	Ship
	BCG ...	Ship	BHH	Hatipara ...	Ship
BCH	Counsellor ...	Ship	BHI	Glamorganshire ...	Ship
BCP	Canadier ...	Ship	BHL	Nucula... ..	Ship
BCQ	Cardigan ...	Ship	BHP	Ngakuta ...	Ship
BCR	Portgwarra ...	Ship	BJJ	Marsden ...	Ship
BCS	Leominster ...	Ship	BJQ	Cymric Pride ...	Ship
BCT	Southlea ...	Ship	BJV	Boldway ...	Ship
BCU	Hilarius ...	Ship	BJW	Gwynmead ...	Ship
BCZ	Cymric Queen... ..	Ship	BJX	Princess BJX ...	Ship
BCZT	City of Bradford ...	Ship	BKG	Svorono ...	Ship
BDB	Karoa ...	Ship	BKM	Corglen ...	Ship
BDC	Saxon Prince ...	Ship	BKN	Kirktown ...	Ship
BDD	Corby ...	Ship	BKO	Mackworth ...	Ship
BDE	Coquetmede ...	Ship	BKR	Bellglade ...	Ship
BDF	Clydesdale BDF ...	Ship	BKX	Francol ...	Ship
BDH	Dictator ...	Ship	BKZ	Fullerton ...	Ship
BDI	Patrician BDI ...	Ship	BLD	Kasara ...	Ship
BDJ	Westborough ...	Ship	BLE	Glynymel ...	Ship
BDK	Newquay ...	Ship	BLJ	S. Theresa ...	Ship
BDM	Burgundy ...	Ship	BLN	British Major ...	Ship
BDN	Lady Cloe ...	Ship	BLR	Tecumeh ...	Ship
BDO	Ben Mohr ...	Ship	BLW	Umona... ..	Ship
BDP	Southern ...	Ship	BLY	Warturm ...	Ship
BDR	Swinburne ...	Ship	BMB	Newaster ...	Ship
BDS	City of		BMD	Havildar ...	Ship
	Birmingham	Ship	BMK	Bothwell BMK ...	Ship
BDU	Valette (La) ...	Ship	BMM	Typhoon ...	Ship
BDY	Buckleigh ...	Ship	BMN	Tideway ...	Ship
BDZ	Betwa ...	Ship	BMO	Corton ...	Ship
BEB	Reval ...	Ship	BMQ	Keyingham ...	Ship
BEC	Strathearn ...	Ship	BMR	Loughborough ...	Ship
BEK	Brendon ...	Ship	BMT	Trewidden ...	Ship
BEM	Bardic ...	Ship	BMZ	Armagh ...	Ship
BEN	Strona ...	Ship	BNA	Tregothnan ...	Ship
BEQ	Belize ...	Ship	BNB	Melita ...	Ship
BEO	Kamouraska ...	Ship	BNC	Ormonde ...	Ship
BEP	Dewsbury ...	Ship	BND	Rosefield ...	Ship
BEQ	Felixstowe ...	Ship	BNE	Riverton BNE ...	Ship
BER	Davo ...	Ship	BNF	Brighton BNF ...	Ship
BET	Cross Hill ...	Ship	BNI	Strathlorne ...	Ship
BEU	Majestic BEX ...	Ship	BNK	Mourino ...	Ship
BEX	Dumfries ...	Ship	BNL	Hurliness ...	Ship
BFA	Greenwich ...	Ship	BNQ	Turkestan ...	Ship
BFB	Spartan Prince ...	Ship	BNS	Baneasa ...	Roumania
BFD	Royal Sceptre... ..	Ship	BNW	Dunolly ...	Ship
BFE	Euterpe ...	Ship	BNX	Chiswick ...	Ship
BFG	Eastgate ...	Ship	BOA	North Anglia ...	Ship
BFH	Heronspool ...	Ship	BOB	Blairmore ...	Ship
BFI	Lowlands ...	Ship	BOD	British Light ...	Ship
BFJ	Specialist ...	Ship	BOE	Ulua ...	Ship
BFK	Madawaska ...	Ship	BOI	British Star ...	Ship
BFM	Gardenia BFO ...	Ship	BOJ	Actor... ..	Ship
BFO					

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BOL	General Church	Ship	BVQ	Perim ...	Persian G.
BON	British Lantern	Ship	BVY	Lizard ...	G.B.
BOP	Clymedede	Ship	BVZ	Carnsore ...	G.B.
BOQ	Thistlemore	Ship	BWK	Kingstown ...	G.B.
BOR	Scottish Bard	Ship	BWP	Ponta Delgada	Portugal
BOU	British Beacon	Ship	BWQ	Queenstown ...	G.B.
BOV	Woldingham ...	Ship	BWW	North Front ...	Gibraltar
BOW	Holtby ...	Ship	BXF	Famagusta ...	Cyprus
BOX	Admiral		BXH	St. Helena ...	St. Helena
	Codrington	Ship	BXW	Seletar	S. Settlement
BOY	Margha ...	Ship	BXY	Stonecutters Is.	Kong Kong
BOZ	Katanga ...	Ship	BYA	Admiralty ...	G.B.
BPB	Dogra ...	Ship	BYB	Cleethorpes Rad.	G.B.
BPG	Braunfels ...	Ship	BYC	Horsea ...	G.B.
BPU	Holbrook BPU	Ship	BYD	Aberdeen ...	G.B.
BPY	Adna ...	Ship	BYE	Ipswich ...	G.B.
BQE	Ronan ...	Ship	BYF	Pembroke ...	G.B.
BQF	Whinfield ...	Ship	BYH	Rosyth ...	G.B.
BQK	Grelton ...	Ship	BYJ	Felixstowe ...	G.B.
BQM	Anomia ...	Ship	BYK	Sheerness ...	G.B.
BQO	Acasta ...	Ship	BYM	Culver Cliff ...	G.B.
BQP	Grelbank ...	Ship	BYN	Portland Bill ...	G.B.
BQQ	Elzasier ...	Ship	BYO	Rame Head ...	G.B.
BQU	New York City	Ship	BYP	Cromarty, Ply-	
BQV	Wells City ...	Ship		mouth ...	G.B.
BQW	Exeter City ...	Ship	BYQ	Corkbeg ...	G.B.
BQX	Chicago City ...	Ship	BYR	Bunbeg ...	G.B.
BQZ	Eaton Grove ...	Ship	BYW	Rock ...	Gibraltar
BRA	Jenangir ...	Ship	BYX	S. Angelo ...	Malta
BRB	Brookvale ...	Ship	BYZ	Rinella ...	Malta
BRG	Esturia ...	Ship	BZA	Inchkeith ...	G.B.
BRI	Frankenfels ...	Ship	BZB	Bermuda Dock-	
BRM	Hunnie ...	Ship		yard	Bermuda
BRP	Joffre ...	Ship	BZC	Portsmouth Sig-	
BRR	Kharki ...	Ship		nal School ...	G.B.
BRZ	Ravenstone ...	Ship	BZD	Martara ...	Ceylon
BSN	Ryde ...	Ship	BZE	Matara ...	Ceylon
BSO	Roker ...	Ship	BZF	Aden Radio ...	Persian G.
BSQ	Purnea ...	Ship	BZH	Seychelles ...	Seychelles
BSR	Bryntawe ...	Ship	BZI	Durban ...	S. Africa
BTA	Koursk ...	Ship	BZJ	Port Nolloth ...	S. Africa
BTC	War Mehtar ...	Ship	BZK	Bathurst ...	Gambia
BTD	Comino ...	Ship	BZL	Demerara ...	Br. Guiana
BTF	William Balls	Ship	BZM	St. John's ...	Newf'dland
BTP	Moorby ...	Ship	BZN	Falkland Is. ...	Falkland Is.
BTR	Lackenby ...	Ship	BZQ	Christiana ...	Br. West
BTS	Carperby ...	Ship			Indies
BTT	Barley ...	Ship	BZR	Somerset Is. ...	Bermuda
BTU	Alfred Calvert	Ship	CD	Ocean Falls ...	Canada
BTW	Johnstown ...	Ship	CZ	Anyox ...	Canada
BTX	Kenah ...	Ship	CAA	Latorre ...	Ship
BTZ	Cormorant BTZ	Ship	CAD	Prat ...	Ship
BUC	Bucharest ...	Roumania	CAE	O'Higgins ...	Ship
BUD	Wearwood ...	Ship	CAF	Esmeralda ...	Ship
BUE	Cronstadt ...	Ship	CAG	Chacabuco ...	Ship
BUF	Petrograd ...	Ship	CAH	Blanco ...	Ship
BUG	Norfolk Range	Ship	CAI	Zenteno ...	Ship
BUH	Harlseywood ...	Ship	CAJ	Errázuriz ...	Ship
BUK	Halocrates ...	Ship	CAK	Baquedano ...	Ship
BUL	Warora ...	Ship	CAL	Rancagua ...	Ship
BUQ	Chilier ...	Ship	CAM	Maipo CAM ...	Ship
BUU	Seatonia ...	Ship	CAN	Angamos ...	Ship
BUV	Tolosa ...	Ship	CAO	Lautaro ...	Ship
BUW	Seabank ...	Ship	CAU	H. 1 ...	Ship
BUX	Rhode Island		CAV	H. 2 ...	Ship
	BUX	Ship	CAW	H. 3 ...	Ship
BUY	Overdale ...	Ship	CAX	H. 4 ...	Ship
BVG	Berwick ...	G.B.	CAY	H. 5 ...	Ship
BVN	Flamborough	G.B.	CAZ	H. 6 ...	Ship

CBA	Lynch ...	Ship	CDY	Miramar ...	Ship
CBB	Condell ...	Ship	CDZ	Montemar ...	Ship
CBC	Williams ...	Ship	CEA	Rio Claro CEA	Ship
CBD	Riveros ...	Ship	CEB	Rio Bueno ...	Ship
CBE	Uribe ...	Ship	CFB	Cartier ...	Ship
CBL	Thompson ...	Ship	CFL	Arleux ...	Ship
CBM	M. Jarpa ...	Ship	CFM	Armentieres ...	Ship
CBN	O'Brien CBN ...	Ship	CFO	Arras CFO ...	Ship
CBO	Serrano ...	Ship	CFP	Thiepval ...	Ship
CBP	Riquelme ...	Ship	CFAC	Calgary ...	Canada
CBQ	Orella ...	Ship	CFCA	Toronto ...	Canada
CBR	M. Gamero ...	Ship	CFCB	Vancouver ...	Canada
CBU	Aguila CBU ...	Ship	CFCD	Winnipeg ...	Canada
CBV	Leucoton ...	Ship	CFCE	Halifax ...	Canada
CBW	Colocolo ...	Ship	CFCF	Montreal ...	Canada
CBX	Elicura ...	Ship	CFCH	Iroquois Falls ...	Canada
CBY	Orompello CBY	Ship	CFCI	Walkerville ...	Canada
CCA	Arica ...	Chile	CFCN	Calgary ...	Canada
CCB	Antofagasta ...	Chile	CFCX	London ...	Canada
CCC	Coquimbo ...	Ship	CFC	Laurentian ...	Ship
CCE	Valparaiso P.	Ship	CFN	Givenchy CFN	Ship
	Ancha ...	Chile	CFPC	Fort Frances ...	Canada
CCG	Santiago Moneda	Chile	CFTC	Toronto ...	Canada
CCH	Santiago Univer-	Chile	CFYC	Vancouver ...	Canada
	sidad ...	Chile	CFZC	Montreal ...	Canada
CCI	Santiago Espejo	Chile	CGA	Australrange ...	Ship
CCJ	Juan Fernandez	Chile	CGB	Australplain ...	Ship
CCK	Talcahno Rocu-	Chile	CGC	S. George CGC	Ship
	ant ...	Chile	CGD	Australglen ...	Ship
CCL	Talcahno Escuela	Chile	CGE	Australford ...	Ship
	de Torpedos ...	Chile	CGF	Eurelia ...	Ship
CCL	Llanquihve ...	Chile	CGG	Eudunda ...	Ship
CCN	Mocha (La) ...	Chile	CGH	Booral ...	Ship
CCO	Llanquihve ...	Chile	CGL	Toromeo ...	Ship
CCP	Punta Areas ...	Chile	CGM	Cooee CGM	Ship
CCQ	Huafo ...	Chile	CGN	Australbrook ...	Ship
CCR	Rio Aysen ...	Chile	CGO	Manurewa ...	Ship
CCS	Raper ...	Chile	CGP	Sumatra CGP	Ship
CCV	Las Torpederas	Chile	CGQ	Kurumba ...	Ship
CCV	Valparaiso ...	Chile	CGR	Biloela ...	Ship
CCV	Bories ...	Chile	CGS	Kowarra ...	Ship
CCX	Punta Arenas	Chile	CGT	Melusia ...	Ship
	Apost Dero ...	Chile	CGV	Wyola ...	Ship
CCY	Evangelistas ...	Chile	CGX	Macedon ...	Ship
CCZ	Felix ...	Chile	CHO	Laketon ...	Ship
CDA	Renaico ...	Ship	CHP	Wethersfield ...	Ship
CDB	Aysen ...	Ship	CHQ	Lingan ...	Ship
CDC	Huasco ...	Ship	CHR	Hochelaga ...	Ship
CDD	Palena ...	Ship	CHU	Modjeska ...	Ship
CDE	Imperial ...	Ship	CHV	Turret Cape ...	Ship
CDF	Cachapoal ...	Ship	CHX	J. A. McKee ...	Ship
CDG	Mapocho ...	Ship	CHY	Thomas Drum-	Ship
CDH	Maipo CDH ...	Ship		mond ...	Ship
CDJ	Caupolican ...	Ship	CHBC	Calgary ...	Canada
CDK	Pisagua ...	Ship	CHCA	Vancouver ...	Canada
CDL	Orompello CDL	Ship	CHCB	Toronto ...	Canada
CDM	Lautaro CDM	Ship	CHCC	Edmonton ...	Canada
CDN	Itata ...	Ship	CHCF	Winnipeg ...	Canada
CDO	Quito CDO ...	Ship	CHCQ	Calgary ...	Canada
CDP	Childè ...	Ship	CHCS	London ...	Canada
CDQ	Magallanes ...	Ship	CHCX	Montreal ...	Canada
CDR	Taital ...	Ship	CHCZ	Toronto ...	Canada
CDR	Talcahuano ...	Ship	CHIC	Hamilton ...	Canada
CDS	Iquique ...	Ship	CHOC	Vancouver ...	Canada
CDT	Florencia ...	Ship	CHVC	Toronto ...	Canada
CDU	Arauco ...	Ship	CHXC	Ottawa ...	Canada
CDV	Calera ...	Ship	CHYC	Montreal ...	Canada
CDW	America CDW	Ship	CJC	Lorne ...	Ship
CDX	Tiltit ...	Ship	CJE	A. E. McKinstry	Ship

CJG	Empress of Japan ...	Ship	CLL	Galicia ...	Ship
CJH	Empress of Russia ...	Ship	CLM	Mahon ...	Spain
CJI	Empress of Asia ...	Ship	CLN	Reina Victoria Eugenia CLN	Ship
CJJ	Guiana ...	Ship	CLO	Vasco Nunez de Balboa ...	Ship
CJK	Talaralite ...	Ship	CLP	Contramaestre Casado ...	Ship
CJO	Blossom Heath ...	Ship	CLQ	Kanguro ...	Ship
CJQ	Lord Dufferin ...	Ship	CLS	Submarino B.1	Ship
CJS	Pinta ...	Ship	CLZ	Carraca (La) ...	Spain
CJT	G. R. Gray ...	Ship	CMA	Apolo ...	Ship
CJV	Monteagle ...	Ship	CMB	Algorténo ...	Ship
CJW	Newona ...	Ship	CMC	Nuria ...	Ship
CJX	Parima... ..	Ship	CMD	Faustino R. San Pedro ...	Ship
CJBC	Montreal ...	Canada	CME	Eolo ...	Ship
CJCA	Edmonton ...	Canada	CMF	Jose Villalonga	Ship
CJCB	Nelson ...	Canada	CMG	Victor Chavarri	Ship
CJCD	Toronto ...	Canada	CMH	Hercules CMH	Ship
CJCE	Vancouver ...	Canada	CMJ	Iturri-Azkar ...	Ship
CJCF	Kitchener ...	Canada	CMJ	Jupiter CMJ ...	Ship
CJCG	Winnipeg ...	Canada	CMK	Claudio ...	Ship
CJCH	Toronto ...	Canada	CML	Maria Milagros	Ship
CJCI	St. John ...	Canada	CMM	Marte CMM ...	Ship
CJCN	Toronto ...	Canada	CMN	Enrique Ballesteros ...	Ship
CJCS	Halifax ...	Canada	CMO	Olavarria ...	Ship
CJCY	Calgary ...	Canada	CMP	Juan Manuel Urquijo ...	Ship
CJGC	London ...	Canada	CMQ	Marzo ...	Ship
CJNC	Winnipeg ...	Canada	CMR	Ramón... ..	Ship
CJSC	Toronto ...	Canada	CMS	Alava ...	Ship
CKB	Glenisla ...	Ship	CMT	Bartolo ...	Ship
CKE	E. B. Osler ...	Ship	CMU	Orio ...	Ship
CKF	Emperor ...	Ship	CMV	Begonia No. 4	Ship
CKG	J. H. G. Hag-garty ...	Ship	CMW	Albal ...	Ship
CKH	Martian ...	Ship	CMX	Valencia ...	Ship
CKI	Midland King ...	Ship	CMY	Euzkera ...	Ship
CKJ	Midland Prince ...	Ship	CMZ	Conde de Zubiria	Ship
CKK	W. D. Matthews ...	Ship	CMAA	Sac 2° ...	Ship
CKL	W. Grant Morden ...	Ship	CNA	Agadir ...	Morocco
CKP	Collingwood ...	Ship	CNJ	Faci ...	Ship
CKS	Canadian Voyager ...	Ship	ENK	Meknassi ...	Ship
CKT	Canadian Pioneer ...	Ship	CNK	Knitra ...	Morocco
CKU	Watuka ...	Ship	CNM	Marrakchi ...	Ship
CKAC	Montreal ...	Canada	CNP	Chétéba ...	Morocco
CKCB	Winnipeg ...	Canada	CNP	Casablanca ...	Morocco
CKCE	Toronto ...	Canada	CNT	Taraudant ...	Morocco
CKCK	Regina ...	Canada	CNV	Vanneau ...	Morocco
CKCR	St. John ...	Canada	CNW	Tangier ...	Morocco
CKCS	Montreal ...	Canada	CNW	Rabat ...	Morocco
CKCZ	Toronto ...	Canada	CNY	Mogador ...	Morocco
CKKC	Toronto ...	Canada	CPA	Ballivián ...	Bolivia
CKOK	Hamilton ...	Canada	CPB	D'Orbigny ...	Bolivia
CKQC	London ...	Canada	CPC	Esteros ...	Bolivia
CKZC	Winnipeg ...	Canada	CPE	Riberalta ...	Bolivia
CLA	Torpedero No. 15	Ship	CPF	Viacha ...	Bolivia
CLB	Torpedero No. 16	Ship	CPG	Cobija ...	Bolivia
CLC	Torpedero No. 17	Ship	CPH	Villa Bella ...	Bolivia
CLD	Delfin CLD ...	Ship	CPI	Trinidad ...	Bolivia
CLE	Dorado ...	Ship	CPJ	S. Ana ...	Bolivia
CLF	Gaviota CLF ...	Ship	CPJ	Cachuela	
CLG	Torpedero No. 18	Ship		Esperanza ...	Bolivia
CLG	Callao ...	Peru	CPK	Guayaramerin	Bolivia
CLH	Torpedero No. 19	Ship	CPL	Manoa ...	Bolivia
CLI	Torpedero No. 20	Ship	COA	Hirondelle ...	Ship
CLJ	Torpedero No. 21	Ship	CRA	San Miguel ...	Portugal
CLK	Torpedero No. 22	Ship	CRA	Faral ...	Portugal

CRB	Sta Maria ...	Portugal	CTS	Patrão Lopes ...	Columbia
CRD	Flores ...	Portugal	CTV	Lisbon ...	Portugal
CRE	Dili ...	Timor	CTW	Macau ...	Portugal
CRF	Port Grande ...	Cape Verde Is.	CTX	Dilly ...	Portugal
CRF	Lisboa Radio ...	Portugal	CTZ	Patria CTZ ...	Portugal
CRL	Loanda ...	Angola	CUA	Goa ...	Ship
CRM	Mossamedes ...	Angola	CUB	Congo ...	Ship
CRN	Novo Redondo ...	Angola	CUC	Amarante CUC	Ship
CRO	Lobito ...	Angola	CUD	Gaza ...	Ship
CRP	Porto ...	Portugal	CUE	Lagos ...	Ship
CRQ	Cabinda ...	Angola	CUF	Lourenço	Ship
CRS	S. Francisco ...	Macao	CUG	Marques	Ship
CRT	Beira ...	Mozambique	CUH	Figueira ...	Ship
CRV	Moçambique ...	Mozambique	CUI	Mormugao ...	Ship
CRW	Quelinane ...	Mozambique	CUJ	India CUI ...	Ship
CRY	Inhambane ...	Mozambique	CUK	Granja ...	Ship
CRZ	Lourenço Marques	Mozambique	CUL	Maio ...	Ship
CRAA	Chinde ...	Ship	CUM	Porto Alexandre	Ship
CRBB	Luabo ...	Ship	CUN	Minho ...	Ship
CRL	Huambo ...	Angola	CUN	Gileannes ...	Ship
CRLM	Malange ...	Angola	CUO	Viana ...	Ship
CRLN	Lubango ...	Angola	CUP	S. Vincent ...	Ship
CSA	Africa CSA ...	Ship	CUQ	Quelimane ...	Ship
CSB	Beira CSB ...	Ship	CUR	Mendes Barata	Ship
CSC	Sado ...	Ship	CUS	S. Jorge	Ship
CSD	Dondo ...	Ship	CUT	S. Tiago CUT	Ship
CSE	Mossamedes ...	Ship	CUU	Pungue ...	Ship
CSF	Funchal ...	Ship	CUW	S. Antao ...	Ship
CSG	Fernao Veloso ...	Ship	CVX	Pangim ...	Ship
CSH	Leca ...	Ship	CVZ	Sacavem ...	Ship
CSI	Gaia ...	Ship	CVA	Durostor ...	Ship
CSJ	Estremadura ...	Ship	CVB	Bucuresti ...	Ship
CSK	Coimbra ...	Ship	CVC	Regele Carol I	Ship
CSL	Porto ...	Ship	CVD	Dacia ...	Ship
CSM	Moçambique ...	Ship	CVF	Imparatul Traian	Ship
CSN	Lima CSN ...	Ship	CVG	Bucegi ...	Ship
CSO	Bolama ...	Ship	CVM	Principesa Maria	Ship
CSP	Portugal ...	Ship	CVO	Oituz ...	Ship
CSQ	Cunene ...	Ship	CVP	Carpati ...	Ship
CSR	Peninsular ...	Ship	CVR	România ...	Ship
CSS	S. Miquel ...	Ship	CVS	Constantza-Tunnel	Roumania
CST	Traz-os-Montes	Ship	CWA	Cerrito ...	Uruguay
CSU	Canda ...	Ship	CWB	Isla de Lobos ...	Uruguay
CSV	Esposende ...	Ship	CWC	English Bank	Uruguay
CSW	Sines ...	Ship	CWC	Lighthouse	Uruguay
CSX	Peniche ...	Ship	CWD	Banco Ingles ...	Uruguay
CSY	Faro ...	Ship	CWE	Uruguay CWD	Ship
CSZ	Zaire ...	Ship	CWF	Montevideo	Ship
CTA	Almirante Reis	Ship	CWG	CWE	Ship
CTB	Vasco da Gama	Ship	CWH	Diez y ocho de Julio...	Ship
CTC	Adamastor ...	Ship	CWI	Baron de Rio Branco	Ship
CTD	S. Gabriel ...	Ship	CXA	Ingeniero ...	Ship
CTE	Foca ...	Ship	CXB	Oyarvide ...	Ship
CTF	Espadarte ...	Ship	CXC	Antonio Mumbru	Ship
CTG	Douro CTG ...	Ship	CXD	Galea ...	Ship
CTG	Cartagena ...	Columbia	CXE	Camproa ...	Ship
CTH	Guidiana ...	Columbia	CXF	Izarra ...	Ship
CTI	Tejo ...	Columbia	CXG	Manuel Espalu	Ship
CTJ	Cinco D'Outubro	Columbia	CXH	Mar del Norte	Ship
CTK	Beira CTK	Columbia	CXI	Ogond ...	Ship
CTL	Ibo ...	Columbia	CXJ	Mar Mediteraneo	Ship
CTM	Vulcano CTM	Columbia	CXK	Iturri-Luze ...	Ship
CTP	Pedro Nunes ...	Columbia	CXL	Leonora CXJ ...	Ship
				Iturri-Aurre ...	Ship
				Luis Urquijo ...	Ship

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CXM	Cabo Menor ...	Ship	DBN	Barnenfels ...	Ship
CXN	Begoña No. 6 ...	Ship	DBO	Marienfels ...	Ship
CXO	Begoña No. 1 ...	Ship	DBP	Sturmfels ...	Ship
CXP	Manuela Pla ...	Ship	DBQ	Lauterfels ...	Ship
CXQ	Oquendo ...	Ship	DBR	Gutenfels ...	Ship
CXR	Mar Cantabrico ...	Ship	DBS	Falkenfels ...	Ship
CXS	Cabo Carvoeira ...	Ship	DBT	Drachenfels ...	Ship
CXT	Teresa Fábregas ...	Ship	DBU	Trautenfels ...	Ship
CXU	Artagan-Mendi ...	Ship	DBV	Bremerhaven ...	Ship
CXV	Villaodrid ...	Ship	DBW	Amassia ...	Ship
CXW	Marques ...	Ship	DBX	Adalia ...	Ship
	Delcampo ...	Ship	DBY	Posschl ...	Ship
CXX	S. Mamés ...	Ship	DBZ	Bockenheim ...	Ship
CXY	Yandiola ...	Ship	DCA	Cairo DCA ...	Ship
CXZ	Guipuzcoa ...	Ship	DCD	Scandia ...	Ship
DA	Swanson Bay ...	Canada	DCE	Cassel ...	Ship
DD	Buckley Bay ...	Canada	DCH	Caroline Hem-	
DF	Düsseldorf ...	Germany		soth ...	Ship
DG	Shawinigan Falls ...	Canada	DCL	Widder ...	Ship
DH	Maisonneuve ...	Canada	DCN	Cronshagen ...	Ship
DJ	Thurston ...	Canada	DCO	Carbo II ...	Ship
	Harbour ...	Canada	DCP	Cap. Polonio ...	Ship
DK	Port Alice ...	Canada	DCR	Christian Horn ...	Ship
DL	Berlin ...	Germany	DCU	Coruna (La) ...	Ship
DM	Margaret Bay ...	Canada	DCV	Madeira ...	Ship
DO	Glace Bay ...	Canada	DDD	Sonnenburg ...	Ship
DQ	Markham ...	Canada	DDE	Deutschland ...	Ship
DS	Iroquois Falls ...	Canada		DDE ...	Ship
DT	Twin Falls ...	Canada	DDG	Titan DDG ...	Ship
DU	Edmonton ...	Canada	DDH	Therese Horn ...	Ship
DV	Victoriaville ...	Canada	DDK	Odin DDK ...	Ship
DW	Gouin Dam ...	Canada	DDM	Admiral ...	Ship
DX	Quebec... ..	Canada	DDN	Boden DDN ...	Ship
DY	Thetford Mines ...	Canada	DDU	Deutschland ...	Ship
DZ	Hamilton ...	Canada	DDZ	Direktor Stoltz ...	Ship
DAA	Adler ...	Ship	DEA	Erika Dea ...	Ship
DAB	Abessinia ...	Ship	DEB	Eisbar ...	Ship
DAC	Achilles ...	Ship	DEC	Elisabeth DEC ...	Ship
DAE	Alexandria ...	Ship	DED	Carlsfeld ...	Ship
DAF	Seelöwe ...	Ship	DEF	Erda ...	Ship
DAG	Seemöwe ...	Ship	DEI	Rose-Marie ...	Ship
DAH	Ereifeld ...	Ship		Hölcken ...	Ship
DAI	Annie-Hugo- ...	Ship	DEJ	Elina ...	Ship
	Stinnes VI ...	Ship	DEK	Herold ...	Ship
DAJ	Arabia DAJ ...	Ship	DEL	Ella ...	Ship
DAK	Gutfield ...	Ship	DEM	Ems ...	Ship
DAM	Aval ...	Ship	DEP	Espana ...	Ship
DAN	Amrum ...	Ship	DER	Ernst Hugo ...	Ship
DAN	Argentina DAN ...	Ship		Stinnes ...	Ship
DAO	Arfeld ...	Ship	DES	Else Hugo ...	Ship
DAP	Aleppo ...	Ship		Stinnes ...	Ship
DAQ	Gonzenheim ...	Ship	DET	Edmund H. ...	Ship
DAR	Adler ...	Ship		Stinnes ...	Ship
DAS	Albatros ...	Ship	DEU	Eupatoria ...	Ship
DAT	Arbeit ...	Ship	DEW	General San ...	Ship
DAU	Artushof ...	Ship		Martin ...	Ship
DAV	Alesia ...	Ship	DEY	Bubendey ...	Ship
DAX	Andalusia DAX ...	Ship	DEZ	Emma Sauber ...	Ship
DAZ	Antiochia ...	Ship	DFA	Fricka ...	Ship
DBA	Brünhilde ...	Ship	DFB	Fürst Bülow ...	Ship
DBB	Bayern... ..	Ship	DFD	Arnfried ...	Ship
DBC	Barcelona DBC ...	Ship	DFE	Faust ...	Ship
DBG	Deutschfeld ...	Ship	DFH	Fritz Hugo ...	Ship
DBH	Selma DBH ...	Ship		Stinnes ...	Ship
DBI	Franziska ...	Ship	DFI	Friesland DFI ...	Ship
DBJ	Franziska ...	Ship	DFK	Marie Horn ...	Ship
DBK	Frauenfels ...	Ship	DFO	Antonio Delfino ...	Ship
DBL	Wartenfels ...	Ship	DFP	Gretchen Müller ...	Ship
DBN	Berta ...	Ship	DFS	Frielinghaus ...	Ship

DFU	Fredrich Franz		DKT	Kurt Woermann	
DFV	IV ...	Ship	DKU	DKT ...	Ship
DGA	Mecklenburg		DKV	Kurt ...	Ship
DGB	DFV...	Ship	DKY	Ditmar Koel ...	Ship
DGE	Gratia DGA ...	Ship	DLA	Anna Kayser ...	Ship
DGF	Greta ...	Ship	DLB	Lisboa ...	Ship
DGG	Grossherzog in		DLC	Ina Lotte Blu-	
DGI	Elisabeth ...	Ship	DLD	menthal ...	Ship
DGJ	Gotenhof ...	Ship	DLE	Anneliese ...	Ship
DGL	Glücksburg ...	Ship	DLF	Ludendorff ...	Ship
DGM	Grille ...	Ship	DLI	Helene ...	Ship
DGN	Algieba ...	Ship	DLJ	Billung... ..	Ship
DGO	Gillhausen ...	Ship	DLK	Alicante ...	Ship
DGP	Grimm ...	Ship	DLM	Alariche ...	Ship
DGQ	Grandon ...	Ship	DLN	Galicia DLK ...	Ship
DGR	Göttingen ...	Ship	DLO	Ralum ...	Ship
DGS	Gottfried Poppe		DLQ	Erik Larsen ...	Ship
DGT	Brema ...	Ship	DLR	Schlesien DLO	Ship
DGU	Grüssgott ...	Ship	DLS	Holger ...	Ship
DGV	Yargis ...	Ship	DLT	Loewer... ..	Ship
DGY	Gotha ...	Ship	DLU	Liebenfels ...	Ship
DGZ	Argus DGU ...	Ship	DLX	Boltenhof ...	Ship
DHB	Gustav Fischer		DLY	Lensahn ...	Ship
DHC	Gallilea ...	Ship	DMA	Luise Leonhardt	Ship
DHD	Georg Zelck ...	Ship	DMB	Altair ...	Ship
DHE	Jacob Schrödter		DMD	Messina ...	Ship
DHF	Irmingard ...	Ship	DME	Martha Hemsoth	Ship
DHG	Harald DHD ...	Ship	DMG	Münsterland ...	Ship
DHI	Halle ...	Ship	DMH	Hameln ...	Ship
DHJ	Havelland ...	Ship	DMI	Marga Hemsoth	Ship
DHK	Rudolf ...	Ship	DMN	Minna Horn ...	Ship
DHL	Hindenburg ...	Ship		Heimdal DMH	Ship
DHM	Helgoland ...	Ship		Minden ...	Ship
DHN	Heinrich Kayser			Mimi ...	Ship
DHP	Hela ...	Ship		Magdalene Vin-	
DHQ	Hamburg DHM			ner ...	Ship
DHR	Herbert Horn		DMQ	Mercur ...	Ship
DHS	Hanau ...	Ship	DMS	Muansa ...	Ship
DHT	Hertha ...	Ship	DMU	Murla ...	Ship
DHU	Hermann Sauber		DMV	Konia ...	Ship
DHV	Hans ...	Ship	DMW	Möwe ...	Ship
DHW	Havenstein ...	Ship	DMY	Mimi Horn ...	Ship
DHX	Harburg ...	Ship	DNA	Altona ...	Ship
DHY	Hannover ...	Ship	DNB	Rheinland ...	Ship
DHZ	Hagen DHW		DND	Niederwald ...	Ship
DIB	Hansa DHX ...	Ship	DNF	Hohen Neuffen	Ship
DIH	Teutonia ...	Ship	DNH	Emden ...	Ship
DII	Herzogin Cecile		DNI	Nicea ...	Ship
DIM	Sebara ...	Ship	DNJ	Najade ...	Ship
DIN	Hannover DIH		DNK	Narvik DNK ...	Ship
DIO	Ingeborg ...	Ship	DNL	Neapel ...	Ship
DIR	Irmgard DIM ...	Ship	DNR	Hermann Bur-	
DIS	Turpin ...	Ship		mester ...	Ship
DIZ	Bilboa ...	Ship	DNS	Nitokris ...	Ship
DJI	Irmgard DIR... ..	Ship	DNT	Nord Friesland	Ship
DJN	Hildegard ...	Ship	DNU	Nienburg ...	Ship
DJO	Tirpitz ...	Ship	DNX	Nixe ...	Ship
DJP	Jonia ...	Ship	DNY	Nymphe DNY	Ship
DJR	Industria ...	Ship	DOA	Orla DOA ...	Ship
	Jason DJO ...	Ship	DOC	Oberbürger-	
	Jupiter DJP ...	Ship		meister Haken	Ship
	Johannes C.		DOD	Orlando ...	Ship
	Russ ...	Ship	DOE	Ostsee ...	Ship
DJT	Atle Jarl ...	Ship	DOF	Osterndorf ...	Ship
DJY	Eisbrecher Berlin		DOG	Ossag ...	Ship
DKA	Kaiser DKA ...	Ship	DOH	Otto Hugo	
DKL	Klupfel ...	Ship		Stinnes ...	Ship
DKO	Köln ...	Ship	DOJ	Condor DOJ ...	Ship
DKQ	Kaiser DKQ ...	Ship	DOL	Holstein ...	Ship

DON	Odin DON ...	Ship	DSG	Adeline Hugo	
DOO	Otranto ...	Ship		Stinnes	Ship
DOQ	Odin DOQ ...	Ship	DSH	Seehund ...	Ship
DOR	Herbert Säuber	Ship	DSJ	Scheer ...	Ship
DOS	Ockenfels ...	Ship	DSK	Hilde Hugo	
DOT	Toreador DOT	Ship		Stinnes ...	Ship
DOY	Norderney ...	Ship	DSL	Steigerwald ...	Ship
DPB	Porta ...	Ship	DSM	Tsad ...	Ship
DPC	Preussen DPC	Ship	DSN	Heinrich Hugo	
DPD	Prinzessin Heinrich ...	Ship		Stinnes	Ship
DPE	Spessart ...	Ship	DSO	Soneck ...	Ship
DPK	Prinkipo ...	Ship	DSR	Sophie Rickmers	Ship
DPL	Privall ...	Ship	DSS	Seestern ...	Ship
DPM	Palermo DPM	Ship	DSU	Sultan ...	Ship
DPN	Eisbrechner		DSW	Sachsenwald ...	Ship
	Preussen ...	Ship	DSX	S. Theresa DSX	Ship
DPO	Pommern ...	Ship	DSY	Seydlitz ...	Ship
DPP	Preussen ...	Ship	DSZ	Jeanette Kayser	Ship
DPR	Peritia ...	Ship	DTA	Adole Sommerfeld ...	Ship
DPS	Prinz Sigismund ...	Ship	DTB	Baltic DTB	Ship
DPT	Prinz Adalbert	Ship	DTC	Artus ...	Ship
DPU	Bosporus ...	Ship	DTD	Danzig ...	Ship
DPW	Prinz Waldemar	Ship	DTE	Bosporus ...	Ship
DPX	Phönix DPX ...	Ship	DTF	Flora Sommerfeld ...	Ship
DPY	Poseidon DPY	Ship	DTG	Gedania ...	Ship
DPZ	Pallas DPZ ...	Ship	DTH	Holm ...	Ship
DQA	Wangerooze ...	Ship	DTI	Ernst ...	Ship
DQB	Ostpreussen ...	Ship	DTJ	Else ...	Ship
DQC	Oberschlesien ...	Ship	DTM	Marmara ...	Ship
DQD	Gunther Russ	Ship	DTO	Oliva TDO	Ship
DQE	Ophelia ...	Ship	DTV	Vistula ...	Ship
DQG	Roland ...	Ship	DTZ	Zoppot ...	Ship
DQH	Alda ...	Ship	DUA	Ussukuma ...	Ship
DQJ	Octavia ...	Ship	DUD	Stralsund ...	Ship
DQK	Ansgrir ...	Ship	DUF	Hammonia ...	Ship
DQN	Wiegand ...	Ship	DUG	Holsatia ...	Ship
	Johanna Blumberg ...	Ship	DUI	Urundi ...	Ship
DQS	Rugia ...	Ship	DUM	Bochum ...	Ship
DQY	Alwine Russ ...	Ship	DUN	Tucuman ...	Ship
DRA	Vorwärts DRA	Ship	DUO	Usaramo ...	Ship
DRC	Rügen ...	Ship	DUP	Schwarzwald ...	Ship
DRE	Reserve Ostsee	Ship	DUS	Usedom ...	Ship
DRF	Reichenfels ...	Ship	DVD	Vaterland ...	Ship
DRG	Toni ...	Ship	DVG	Vigo DVG ...	Ship
DRH	Reserve Holt-enau ...	Ship	DVI	Villagarcia DVI	Ship
DRI	Reiher DRI	Ship	DVK	Vegesack ...	Ship
DRJ	Rio de Janeiro DRJ ...	Ship	DVO	Volos ...	Ship
DRK	Ruth Kayser ...	Ship	DVS	Vorwärts DVS	Ship
RDL	Real ...	Ship	DVU	Venus DVU ...	Ship
DRN	Rheinland ...	Ship	DWA	Waganda ...	Ship
DRN	Pfalz ...	Ship	DWB	Wartburg ...	Ship
DRP	Rhodopis ...	Ship	DWD	Wotan DWD ...	Ship
DRQ	Saar ...	Ship	DWE	Westfalen ...	Ship
DRR	Reiher ...	Ship	DWF	Wolfram ...	Ship
DRS	Radames ...	Ship	DWG	Wigburt DWG	Ship
DRV	Ruth DRV ...	Ship	DWH	Wendemuth ...	Ship
DRW	Retter ...	Ship	DWI	Wilhelm ...	Ship
DRY	Duisburg ...	Ship	DWJ	Wajao ...	Ship
DRZ	Rudolf Albrecht	Ship	DWL	Westerwald ...	Ship
DSA	Salvator DSA ...	Ship	DWM	Wilhelm Russ	Ship
DSB	Strassburg ...	Ship	DWN	Wangoni ...	Ship
DSC	Schelde ...	Ship	DWO	Woglinde ...	Ship
DSD	Seeadler DSD	Ship	DWP	Winifried DWP	Ship
DSE	Seeadler DSE ...	Ship	DWQ	Wellgunde ...	Ship
			DWR	Werdenfels ...	Ship
			DWT	Henner ...	Ship
			DWU	Württemberg	Ship

DWW	Martha Woermann	Ship	EBR	Bonifaz	...	Ship
DXC	Malaga	Ship	EBS	Lauria	...	Ship
DXD	Adana	Ship	EBT	Laya	...	Ship
DXF	Horncap	Ship	EBU	Recalde	...	Ship
DXG	Hornfels	Ship	EBV	Nautilus	...	Ship
DXK	Henry Lütgens	Ship	EBW	S. Fernando	...	Spain
DXL	Eider DXL	Ship	EBX	Ferrol (Le)	...	Spain
DXM	Elbe	Ship	EBZ	Cartagena	...	Spain
DXN	Cartagena	Ship	ECA	Madrid	...	Spain
DXO	Ilmenau	Ship	ECB	Balmes	...	Ship
DXP	Pinnau	Ship	ECC	Barcelona ECB	...	Ship
DXQ	Pontos DXQ	Ship	ECD	Cadiz	...	Ship
DXR	Hercules DXR	Ship	ECE	Valverde	...	Ship
DXS	Tamara II	Ship	ECF	Emilia S. de	...	Ship
DXW	Este	Ship	ECG	Perez	...	Ship
DXY	R. C. Rickmers	Ship	ECH	Carolina E. de	...	Ship
DXZ	Parafia DXZ	Ship	ECI	Perez	...	Ship
DXZ	Edmund Siemens	Ship	ECJ	Arriluce	...	Ship
DYH	Hugo Stinnes	Ship	ECK	Mar Rojo	...	Ship
DYI	Ymir	Ship	ECL	Gueteria	...	Ship
DYJ	Siracusa	Ship	ECM	Jaime Girona	...	Ship
DYM	August Schultze	Ship	ECN	Cabo Tres Forcas	...	Ship
DYN	Altmark	Ship	ECO	P. Claris	...	Ship
DYP	Fasolt	Ship	ECP	Mar Tirreno	...	Ship
DYR	Baldur	Ship	ECQ	Marques de	...	Ship
DYT	Theben	Ship	ECR	Urquijo	...	Ship
DYX	Carl Vinnen	Ship	ECS	Mouro	...	Ship
DYY	Werner Vinnen	Ship	ECT	Juan de Abris-	...	Ship
DZA	Leona	Ship	ECU	queta	...	Ship
DZE	Zeus	Ship	ECV	Delores de la	...	Ship
DZK	Fritz Stauss	Ship	ECW	Torre	...	Ship
EAA	Aranjuez	Spain	ECX	Treesa Tayá	...	Ship
EAB	Barcelona Radio	Spain	ECY	Ceferino Balles-	...	Ship
EAB	Tangier Legation	Morocco	ECZ	teros	...	Ship
EAC	Cadiz	Spain	ECLA	Catalina	...	Ship
EAF	Cabo Finisterre	Spain	ECLB	Cabo Cervera	...	Ship
EAF	Lighthouse	Spain	ECLC	Mar Negro	...	Ship
EAL	Cabo Finisterre	Spain	ECLD	Conde Wilfredo	...	Ship
EAO	Palmas, Las	Spain	ECLD	Galdames	...	Ship
EAP	Soller Radio	Spain	ECLD	Infanta Isabel	...	Ship
EAS	Cabo de Palos	Spain	ECLD	ECY	...	Ship
EAT	Cabo Mayor	Spain	ECLD	Martin Saenz	...	Ship
EAV	Tenerife	Spain	ECLD	Cuatro Vientos	...	Spain
EAY	Vigo	Spain	ECLD	Madrid-Direccion	...	Ship
EBA	Santa Isabel de	Spain	ECLD	Aeronautica	...	Spain
EBB	Fernando Po	Ship	ECLD	Militar	...	Spain
EBB	Espana EBA	Ship	ECLD	Getafe	...	Spain
EBB	Alfonso XIII	Ship	ECLD	Alcázares (Los)	...	Spain
EBB	EBB...	Ship	ECLD	Sevilla	...	Spain
EBC	Jaime I	Ship	ECLD	Alicante EDA	...	Ship
EBD	Pelayo	Ship	ECLD	Buenos Aires	...	Ship
EBE	Carlos V	Ship	ECLD	EDB	...	Ship
EBF	Cataluna EBF	Ship	ECLD	Cataluna EDC	...	Ship
EBG	Princesa de	Ship	ECLD	Alfonso XII	...	Ship
EBH	Asturias	Ship	ECLD	Deva	...	Ship
EBI	Reina Regente	Ship	ECLD	Guadalquivir	...	Ship
EBJ	Giraldi	Ship	ECLD	Legazpi	...	Ship
EBJ	Extremadura	Ship	ECLD	C. Lopez y Lopez	...	Ship
EBK	EBJ	Ship	ECLD	Infanta Isabel	...	Ship
EBK	Rio de la Plata	Ship	ECLD	de Borbon	...	Ship
EBK	EBK	Ship	ECLD	Joaquin del	...	Ship
EBL	Infanta Isabel	Ship	ECLD	Pielago	...	Ship
EBL	EBL	Ship	ECLD	Reina Maria	...	Ship
EBM	Alvaro de Bazan	Ship	ECLD	Cristina	...	Ship
EBN	Almirante Lobo	Ship	ECLD	Antonio Lopez	...	Ship
EBO	Bustmante	Ship	ECLD	Manuel Calvo	...	Ship
EBP	Villaamil	Ship	ECLD	Montserrat	...	Ship
EBQ	Cadarso	Ship	ECLD	Leon XIII	...	Ship
			ECLD	Isla de Panay	...	Ship

EDQ	S. Carlos ...	Ship	EGE	Barcelona ...	Spain
EDR	Florinda ...	Ship	EGF	Larache ...	Spain
EDS	P. Satrustegui ...	Ship	EGG	Valencia ...	Spain
EDT	Alfonso XIII ...	Ship	EGH	Bilbao ...	Spain
	EDT... ...	Ship	EGI	Mahon ...	Spain
EDU	Reina Victoria ...	Ship	EGJ	Coruna ...	Spain
	Eugenia EDU ...	Ship	EGK	Tetuan ...	Spain
EDV	Montevideo EDV ...	Ship	EGL	Cabo Juby ...	Spain
EDW	Arraitz-Mendi ...	Ship	EGM	Málaga ...	Spain
EDX	Juliana ...	Ship	EGO	Alhucemas ...	Spain
EDY	Navarra EDY ...	Ship	EGZ	Guadalajara ...	Spain
EDZ	Ciudad de Cadiz ...	Ship	EHA	Torpedero No. 1 ...	Ship
EEA	Auxias March ...	Ship	EHB	Torpedero No. 2 ...	Ship
EEB	Barcelo ...	Ship	EHC	Torpedero No. 3 ...	Ship
EEC	Cabanal ...	Ship	EHD	Torpedero No. 4 ...	Ship
EED	Andalucia ...	Ship	EHE	Torpedero No. 5 ...	Ship
EEE	Torras y Bages ...	Ship	EHF	Torpedero No. 6 ...	Ship
EEF	Vicente Ferrer ...	Ship	EHG	Torpedero No. 7 ...	Ship
EEG	Grao ...	Ship	EHH	Torpedero No. 8 ...	Ship
EEH	J. B. Llovera ...	Ship	EHI	Torpedero No. 9 ...	Ship
EEI	Jativa ...	Ship	EHJ	Torpedero No. 10 ...	Ship
EEJ	Jorge Juan ...	Ship	EHK	Torpedero No. 11 ...	Ship
EEK	Canalejas ...	Ship	EHL	Torpedero No. 12 ...	Ship
EEL	A. Lazaro ...	Ship	EHM	Torpedero No. 13 ...	Ship
EEM	Aragon... ...	Ship	EHN	Torpedero No. 14 ...	Ship
EEN	Gen. Fernandez ...	Ship	EHO	Osado ...	Ship
	Silvestre ...	Ship	EHP	Isaac Peral ...	Ship
EEO	Sagunto ...	Ship	EHQ	Audaz ...	Ship
EEP	Vicente Puchol ...	Ship	EHR	Prosperpina ...	Ship
EEQ	Castilla ...	Ship	EHS	Terror EHS ...	Ship
EER	Vicente la Roda ...	Ship	EHT	Hernan Cortes ...	Ship
EES	J. J. Sister ...	Ship	EHU	Dedalo ...	Ship
EET	Teodoro Llorente ...	Ship	EHV	Maria de Molina ...	Ship
EEU	Alhambra ...	Ship	EHX	Submarino A.1 ...	Ship
EEV	J. Verdagner ...	Ship	EHX	Marques de la ...	Ship
EEW	Villareal ...	Ship		Victoria ...	Ship
EEX	Navarra EEX ...	Ship	EHY	Submarino A.2 ...	Ship
EY	Motrico ...	Ship	EHZ	Submarino A.3 ...	Ship
EEZ	Tambre ...	Ship	EIE	Hampstead Hth. ...	Ship
EFA	Atlante EFA ...	Ship	EIF	Discoverer EIF ...	Ship
EFB	Bellver ...	Ship	EIG	Merchant ...	Ship
EFC	Cataluna EFC ...	Ship	EIH	Navigator ...	Ship
efd	Delfin EFD ...	Ship	EII	City of Smyrna ...	Ship
EFE	Teresa Pamies ...	Ship	EIJ	Crewe Hall ...	Ship
EFF	Salvador EFF ...	Ship	EIK	Crosby Hall ...	Ship
EFG	Marcaspio ...	Ship	EIO	Warkworth ...	Ship
EFH	Hesperides EFH ...	Ship	EIP	Port Hacking ...	Ship
EFI	Isleno ...	Ship	EIR	Clan Morrison ...	Ship
EFJ	Rey Jaime I ...	Ship	EIS	Clan Monroe ...	Ship
EFK	Mallorca ...	Ship	EIT	Clan Ranald ...	Ship
EFL	Lulio ...	Ship	EIU	Inverness ...	Ship
EFM	Tangoreño ...	Ship	EJB	Woodcock EJB ...	Ship
EFN	Mahon ...	Ship	EJD	Benavon ...	Ship
EFO	Isla de Menorca ...	Ship	EJE	Queensland ...	Ship
EFP	Torre Blanca ...	Ship	EJF	Aguila EJF ...	Ship
EFQ	Menorquin ...	Ship	EJH	Roxburgh ...	Ship
EFR	Balear ...	Ship	EJI	Dundrennan ...	Ship
EFS	Rey Jaime II ...	Ship	EJJ	Hyanthes ...	Ship
EFT	Monte Toro ...	Ship	EJN	Mercedes de ...	Ship
EFU	Turia ...	Ship		Larrinaga ...	Ship
EFV	Reina Victoria ...	Ship	EJR	Anselma de ...	Ship
EFW	Villagarcia EFW ...	Ship		Larrinaga ...	Ship
EFX	Tirso EFX ...	Ship	EJT	Navasota ...	Ship
EFY	Fuerteventura ...	Ship	EJV	Sudbury EJV ...	Ship
EFZ	Jaume D'Urgell ...	Ship	EJW	Port Chalmers ...	Ship
EGA	Almeira ...	Spain	EJY	Volute ...	Ship
EGB	Melilia ...	Spain	EKA	Silversand ...	Ship
EGC	Madrid ...	Spain	EKC	Benrinnes ...	Ship
EGD	Ceuta ...	Spain	EKD	Spilsby... ...	Ship

EKF	Carisbrook ...	Ship	EOL	Arabier ...	Ship
EKH	Southport ...	Ship	EON	Cimbrier ...	Ship
EKI	Wearbridge ...	Ship	EOO	Exmouth ...	Ship
EKM	Nahronda ...	Ship	EOQ	Neko ...	Ship
EKN	Portloe ...	Ship	EOR	Stanley Hall ...	Ship
EKO	Marlwood ...	Ship	EOS	David Lloyd George ...	Ship
EKR	Salient ...	Ship	EOT	Invicta EOT (L') ...	Ship
EKT	Warfield ...	Ship	EOV	Mesaba ...	Ship
EKW	Manchester ...	Ship	EOW	Hellenes ...	Ship
	Brigade ...	Ship	EOX	Hostilius ...	Ship
EKY	Kurmark ...	Ship	EOZ	Needwood ...	Ship
ELA	Gloria de ...	Ship	EPA	E. O. Saltmarsh ...	Ship
	Larrinaga ...	Ship	EPB	Maindy Manor ...	Ship
ELB	Ventura de ...	Ship	EPC	Maindy Court ...	Ship
	Larrinaga ...	Ship	EPO	Flying Breeze ...	Ship
ELF	Iddesleigh ...	Ship	EPE	Rothley ...	Ship
ELH	Garryvale ...	Ship	EPF	Grelstone ...	Ship
ELI	Concordia ELI ...	Ship	EPG	Kirkwood ...	Ship
ELL	Angula ...	Ship	EPH	Jolly Inez ...	Ship
ELM	Novington ...	Ship	EPJ	Rumney ...	Ship
ELN	Queen Alexandra ...	Ship	EPK	British Vine ...	Ship
ELN	Revel ...	France	EPL	Somerset EPL ...	Ship
ELQ	Dungeness ...	Ship	EPM	Senator EPM ...	Ship
ELS	Langton Hall ...	Ship	EPN	Port Augusta ...	Ship
ELT	Severnmede ...	Ship	EPQ	Benvenue ...	Ship
ELU	Flixton ...	Ship	EPU	Statesman ...	Ship
ELV	Burnholme ...	Ship	EPW	Hapsalu ...	Spain
ELW	Saxilby ...	Ship	EPW	Avonmede ...	Ship
ELY	Graziella ELY ...	Ship	EPZ	Gwymeric ...	Ship
ELZ	Manchester Div. ...	Ship	EQB	Port Alma ...	Ship
EMA	Maria de ...	Ship	EQC	British Rose ...	Ship
	Larrinaga ...	Ship	EQD	Port Victor ...	Ship
EMB	Asuncion de ...	Ship	EQE	Prygona ...	Ship
	Larrinaga ...	Ship	EQI	Clan Kennedy ...	Ship
EMG	Asturian ...	Ship	EQK	Gwladys ...	Ship
EMH	Austrian ...	Ship	EQN	Sampan ...	Ship
EMJ	Lucigen ...	Ship	EQP	Megna ...	Ship
EMK	Falernian ...	Ship	EQQ	Staveley ...	Ship
EML	Malantian ...	Ship	EQR	Banbury Castle ...	Ship
EMM	City of Shanghai ...	Ship	EQV	Kapidan EQV ...	Ship
EMN	Maronian ...	Ship	EQY	Rotenfels ...	Ship
EMS	Professor EMS ...	Ship	ERB	Leeds City ...	Ship
EMT	Thessaly ...	Ship	ERC	York Castle ...	Ship
EMV	Wyeecrag ...	Ship	ERE	Corfe Castle ...	Ship
EMZ	Tantah ...	Ship	ERF	Umzinto ...	Ship
ENA	Vasconia ...	Ship	ERH	Epsom ...	Ship
ENC	Rocio ...	Ship	ERI	Umtali ...	Ship
END	Hermione ...	Ship	ERL	Assiout ...	Ship
ENE	Governor ...	Ship	ERR	Withington ...	Ship
ENF	Bankdale ...	Ship	ERS	Scottish Monach ...	Ship
ENH	Lompoc ...	Ship	ERU	Wearpool ...	Ship
ENI	Kent ...	Ship	ERW	Prah ...	Ship
ENJ	Maid of Orleans ...	Ship	ERY	Vancouver ...	Ship
ENK	Jersey Moor ...	Ship	ERZ	Erroll ...	Ship
ENL	Wairuna ...	Ship	ESA	Makalia ...	Ship
ENN	Andrée ...	Ship	ESC	Malayan ...	Ship
ENP	Llanthony Abbey ...	Ship	ESD	Devon City ...	Ship
ENQ	Nowshera ...	Ship	ESE	Brodsworth ...	Ship
ENR	Gleneden ...	Ship	ESF	Chalister ...	Ship
ENS	Benalder ...	Ship	ESH	Gambia ...	Ship
ENT	Levenpool ...	Ship	ESO	Sicily ...	Ship
ENV	Glensanda ...	Ship	ESQ	Kalimba ...	Ship
ENW	Logician ...	Ship	ESR	Janeta ...	Ship
ENX	Fenchurch ...	Ship	ESS	Brescia ...	Ship
EOB	Clematis EOB ...	Ship	EST	Phrygia ...	Ship
EOC	Tafna EOC ...	Ship	ESV	Wye Valley ...	Ship
EOE	City of Baroda ...	Ship	ESW	Roma ESW ...	Ship
EOG	Nevisian ...	Ship	ESY	Bellerby ...	Ship
EOJ	Sitra ...	Ship			

ESZ	Nigaristan ...	Ship	EXW	Cardiff EXW ...	Ship
ETB	Director ETB ...	Ship	EXY	Penrhydd ...	Ship
ETC	Oak Branch ...	Ship	EYA	Lacuna ...	Ship
ETF	Lamington ...	Ship	EYB	British Maple ...	Ship
ETG	Hortensius ...	Ship	EYC	Lampas ...	Ship
ETI	Skipton Castle ...	Ship	EYD	British Birch ...	Ship
ETK	Marnetown ...	Ship	EYE	Tuscara a ...	Ship
EIL	Troutpool ...	Ship	EYF	Cadillac ...	Ship
ETM	Stagpool ...	Ship	EYG	Saranac ...	Ship
ETP	County of Cardi- gan ...	Ship	EYH	Spermina ...	Ship
ETQ	North Britain ...	Ship	EYI	Vennonia ...	Ship
ETS	Freshwater ...	Ship	EYJ	Tiara ...	Ship
ETT	Camerata ...	Ship	EYK	Candidate ...	Ship
ETV	Manchurian Prince ...	Ship	EYL	Centurion EYL ...	Ship
ETY	Bradburn ...	Ship	EYM	British Peer ...	Ship
ETZ	Petersham ...	Ship	EYN	British Knight ...	Ship
EUA	Antigon EUA ...	Ship	EYO	Coq ...	Ship
EUB	Homeside ...	Ship	EYP	Luciline ...	Ship
EUE	Headcliffe ...	Ship	EYQ	Lutetian ...	Ship
EUM	Brabandier ...	Ship	EYR	Horden ...	Ship
EUN	Geddington Court ...	Ship	EYS	British Earl ...	Ship
EUQ	Apsley ...	Ship	EYU	British Baron ...	Ship
EUS	Ariadne Irene ...	Ship	EYV	Kaitoke ...	Ship
EUU	Pruth ...	Ship	EYW	British Marquis ...	Ship
EUW	Queen Louise ...	Ship	EYX	Tynemouth ...	Ship
EUZ	Zermati ...	Ship	EYY	British Duke ...	Ship
EVA	Mesopotamia ...	Ship	EZA	Dunclutha ...	Ship
EVB	Springburn ...	Ship	EZE	British Fern ...	Ship
EVC	Rabymere ...	Ship	EZF	Melona ...	Ship
EVD	River Orontes ...	Ship	EZG	Limicana ...	Ship
EVF	Umzumbi ...	Ship	EZH	Pyrula ...	Ship
EVG	Willesden ...	Ship	EZJ	British Holly ...	Ship
EVJ	Corwen ...	Ship	EZK	Litiopa ...	Ship
EVL	Hartfield ...	Ship	EZL	Snaefell ...	Ship
EVN	Newtonmoor ...	Ship	EZM	Lindenhall ...	Ship
EVN	Queen Elizabeth ...	Ship	EZN	Biarritzesn ...	Ship
EVP	Willcasino ...	Ship	EZO	Regent ...	Ship
EVU	Stanmore ...	Ship	EZS	Lady Astley ...	Ship
EVW	Physa ...	Ship	EZT	Hampstead ...	Ship
EVY	Atholl ...	Ship	EZW	Whateley Hall ...	Ship
EVZ	S. Stephen ...	Ship	EZX	Barmoor ...	Ship
EWB	Venusia ...	Ship	EZY	Eaton Hall ...	Ship
EWB	Perth EWB ...	Ship	FB	Fort Smith ...	Canada
EWC	Wimborne ...	Ship	FC	Montreal ...	Canada
EWE	Clarissa Radcliffe ...	Ship	FF	Bear Trap Camp ...	Canada
EWG	Palm Branch ...	Ship	FF	Sofia ...	Bulgaria
EWH	Datchet ...	Ship	FG	New Glasgow ...	Canada
EWN	Tabarka ...	Ship	FH	Toronto ...	Canada
EWR	Pengreep ...	Ship	FJ	Vancouver ...	Canada
EWS	Twickenham ...	Ship	FK	Niagara Falls ...	Canada
EWU	Beckenham ...	Ship	FL	Twenty Mile Creek ...	Canada
EWV	Blackheath ...	Ship	FL	Paris—Eiffel Tower ...	France
EWZ	Cairngowan ...	Ship	FM	Port Credit ...	Canada
EXB	Norwich City ...	Ship	FM	Frankfurt-on-M. ...	Germany
EXC	Harperley ...	Ship	FN	Toronto ...	Canada
EXE	Isle Moor ...	Ship	FO	Burlington ...	Canada
EXF	Llangorse ...	Ship	FP	Blubber Bay ...	Canada
EXI	Scaldier ...	Ship	FO	Anticosti Island ...	Canada
EXJ	Sorrento ...	Ship	FR	Ellis Bay ...	Canada
EXK	Reading ...	Ship	FAA	Erore ...	Ship
EXN	Auguste Halenke ...	Ship	FAB	S. Ayguil ...	Ship
EXO	Albany EXO ...	Ship	FAC	Carmen FAC ...	Ship
EXP	Bretanier ...	Ship	FAD	Chezine ...	Ship
EXR	Ocean Monarch ...	Ship	FAE	Cambronne ...	Ship
EXS	Copenhagen EXS ...	Ship	FAF	Eider II ...	Ship
EXT	Corstar ...	Ship	FAG	Grandlieu ...	Ship
EXU	Skegness ...	Ship	FAH	Rhuys ...	Ship

FAI	Breiz-Izel ...	Ship	FAGT	Tapage... ...	Ship
FAJ	S. Tropez ...	Ship	FAGU	Fulgurant ...	Ship
FAK	Elisabeth Marie ...	Ship	FAGW	C.30 ...	Ship
FAL	Isolè ...	Ship	FAGZ	Gustave-Zede ...	Ship
FAM	Odet ...	Ship	FAHB	Bretagne ...	Ship
FAN	Surville ...	Ship	FAHC	Cèdre ...	Ship
FAO	Hanoi ...	French IndoChina	FAHD	Dunkerque ...	Ship
			FAHK	Hâleur ...	Ship
FAP	Provence FAP ...	Ship	FAHM	Montcalm FAHM ...	Ship
FAQ	Kerido II ...	Ship	FAHO	Hermione FAHO ...	Ship
FAR	Kerdonis II ...	Ship	FAHR	Ernest-Renan ...	Ship
FAS	S. Raphaël ...	Ship	FAHU	Henri-Fournier ...	Ship
FAT	Fregate II ...	Ship	FAHW	Favori ...	Ship
FAU	Divatte ...	Ship	FAHY	Torpilleur ...	Ship
FAV	Limoges ...	Ship	FAHZ	C.56 ...	Ship
FAW	Joselle ...	Ship	FAIB	A.T.10 ...	Air
FAX	Heron FAX ...	Ship	FAIC	A.T.12 ...	Air
FAY	Yser FAY ...	Ship	FAID	A.T.14... ...	Air
FAZ	Sevrè ...	Ship	FAIG	Gloire ...	Ship
FABC	Renne ...	Ship	FAIL	Cornelie ...	Ship
FABE	Béthune ...	Ship	FAIL	A.T.15 ...	Air
FABG	Gueydon ...	Ship	FAIM	A.T.16 ...	Air
FABH	Bien-Hoa ...	Ship	FAIN	Diana Fain ...	Ship
FABJ	Crabe FABJ ...	Ship	FAIP	C.50 ...	Ship
FABK	Gaston Rivier ...	Ship	FAIO	A.T.19 ...	Air
FABL	Belfort FABL... ..	Ship	FAIS	Seine I ...	Ship
FABM	Victoire III ...	Ship	FAIT	A.T.20 ...	Air
FABN	Balny ...	Ship	FAIV	Voltaire FAIV ...	Ship
FABO	Bellone ...	Ship	FAIY	C.06 ...	Ship
FABP	Provence FABP ...	Ship	FAJB	Z.D.1 ...	Air
FABQ	Sonde ...	Ship	FAJC	Jacques-Cœur ...	Ship
FABR	Bout-Dehors ...	Ship	FAJD	Z.D.2 ...	Air
FABS	Octant ...	Ship	FAJE	D'Estrées ...	Ship
FABT	Astrolabe ...	Ship	FAJG	Jeanne Geneviève ...	Ship
FABU	Huron FABU ...	Ship			
FABV	Thetis FABV ...	Ship	FAJK	C.49 ...	Ship
FABW	Torpilleur ...	Ship	FAJL	Laborieux ...	Ship
FABY	O'Byrne ...	Ship	FAJM	Jules-Michelet ...	Ship
FABZ	C.27 ...	Ship	FAJN	Z.D.3 ...	Air
FACB	Calmar ...	Ship	FAJO	Joessel ...	Ship
FACD	Diderot ...	Ship	FAJP	Z.D.4 ...	Air
FACE	Centauré FACE ...	Ship	FAJW	C.58 ...	Ship
FACH	Chamois ...	Ship	FAKB	V.Z.1 ...	Air
FACM	Clameur ...	Ship	FAKC	V.Z.2 ...	Air
FACO	Courbet ...	Ship	FAKG	Garonne FAKG ...	Ship
FACP	Paul-Chailley ...	Ship	FAKH	V.Z.3 ...	Air
FACU	C.51 ...	Ship	FAKJ	V.Z.4 ...	Air
FACX	Condé FACX ...	Ship	FAKL	Franklin FAKL ...	Ship
FACY	Cyclope ...	Ship	FAKM	V.Z.5 ...	Air
FADK	C.85 ...	Ship	FAKN	C.79 ...	Ship
FADL	Doudart-de-Lagrée ...	Ship	FAKO	V.Z.6 ...	Air
			FAKP	V.Z.8 ...	Air
FADM	Marseillaise FADM ...	Ship	FAKQ	V.Z.10 ...	Air
			FAKS	V.Z.11 ...	Air
FADO	Dorade... ..	Ship	FAKT	V.Z.12 ...	Air
FADP	Duperre FADP ...	Ship	FAKU	V.Z.14 ...	Air
FADQ	Edgar-Quinet ...	Ship	FAKV	V.Z.15 ...	Air
FADR	Andromaque ...	Ship	FAKW	V.Z.16 ...	Air
FADX	Pourquoi Pas... ..	Ship	FAKX	C.72 ...	Ship
FADY	Faucon ...	Ship	FAKY	V.Z.17 ...	Air
FADDM	Méditerranée ...	Air	FALB	Albatros FALB ...	Ship
FAGD	Gladiateur ...	Ship	FALC	Jean Autric ...	Ship
FAGJ	Jean-Bart ...	Ship	FALD	Aldébaran FALD ...	Ship
FAGL	Regnault ...	Ship	FALE	Eparges (Les) ...	Ship
FAGL	Clorinde ...	Ship	FALG	Lagrange ...	Ship
FAGM	Meg ...	Ship	FALH	Leon-Mignot ...	Ship
FAGO	Goliath FAGO ...	Ship	FALI	Liévin ...	Ship
FAGP	Patrie FAGP ...	Ship	FALJ	Halbronn ...	Ship
FAGR	Gorgone ...	Ship	FALK	C.53 ...	Ship

FALM	Pierre Marrast	Ship	FAQC	Chêne ...	Ship
FALN	Lorraine FALN	Ship	FAQD	Pingouin ...	Ship
FALP	Laplace FALP	Ship	FAQE	Epinal ...	Ship
FALQ	Jean Roulier ...	Ship	FAQG	Tanche ...	Ship
FALR	Rhône ...	Ship	FAQH	Torpilleur 328...	Ship
FALS	Trinite-Shille- mans ...	Ship	FAQJ	Torpilleur 368...	Ship
FALT	Tourville ...	Ship	FAQK	Vedette 34 ...	Ship
FALU	Lunéville ...	Ship	FAQL	Loiret ...	Ship
FALV	Carissan ...	Ship	FAQO	C.55 ...	Ship
FALW	Jean-Corre ...	Ship	FAQP	Vedette 62 ...	Ship
FALZ	Victor-Reveille	Ship	FAQR	Quentin-Roose- velt ...	Ship
FAMH	Torpilleur 332...	Ship	FAQT	Tourterelle ...	Ship
FAMI	Amiens ...	Ship	FAQW	Vedette ...	Ship
FAMJ	Jeanne D'Arc FAMJ ...	Ship	FAQX	Fourrageur ...	Ship
FAML	Lutteur ...	Ship	FAQY	Vedette 70 ...	Ship
FAMN	Mastodonte ...	Ship	FARB	Cerbère ...	Ship
FAMP	Lamotte-Picquet	Ship	FARH	Aurochs ...	Ship
FAMR	Frimaire ...	Ship	FARL	C.17 ...	Ship
FAMS	Shamrock FAMS	Ship	FARM	Roland-Morillot	Ship
FAMT	Travailleur ...	Ship	FARN	Ernest ...	Ship
FAMX	C.63 ...	Ship	FART	Artemis FART	Ship
FANB	Rene Audrey ...	Ship	FARU	Brumaire ...	Ship
FANC	Condorcet ...	Ship	FARV	Revigny ...	Ship
FAND	Dordogne ...	Ship	FARW	Waldeck- Rousseau ...	Ship
FANE	Enseigne- Gabolde ...	Ship	FASD	Cassard ...	Ship
FANG	Vimy Fang ...	Ship	FASI	Simoun ...	Ship
FANI	Antigone FANI	Ship	FASM	Samson ...	Ship
FANJ	Troupier ...	Ship	FASN	Sané ...	Ship
FANK	Estafette ...	Ship	FASO	Séminole FASO	Ship
FANL	Six-Fours ...	Ship	FASP	Paris FASP ...	Ship
FANR	Durance ...	Ship	FASR	Astrée FASR ...	Ship
FANT	Atalante ...	Ship	FASY	C.45 ...	Ship
FANW	C.80 ...	Ship	FATC	Coquelicot ...	Ship
FANY	Armide ...	Ship	FATG	Taillebourg ...	Ship
FAOC	Rance ...	Ship	FATH	Aréthuse ...	Ship
FAOD	Dolphin FAOD	Ship	FATI	C.57 ...	Ship
FAOE	Furieux ...	Ship	FATL	Athlète ...	Ship
FAOG	Creusot ...	Ship	FATO	Tourteau ...	Ship
FAOH	Flamands (Les)	Ship	FATV	Volta FATV ...	Ship
FAOJ	Perdrix ...	Ship	FATZ	Var ...	Ship
FAOK	Ripault (Le) ...	Ship	FAUC	Canard... ..	Ship
FAOL	Dunarea FAOL	Ship	FAUI	Utile ...	Ship
FAON	Craonne ...	Ship	FAUL	Euler ...	Ship
FAOP	Pigeon FAOP	Ship	FAUM	Michel et Renée	Ship
FAOQ	Indret ...	Ship	FAUO	Fulton FAUO...	Ship
FAOR	Forfait ...	Ship	FAUR	Curie ...	Ship
FAOV	Fauvette ...	Ship	FAUY	Dupuy-de-Lôme	Ship
FAOZ	C.81 ...	Ship	FAVC	Vaucluse FAVC	Ship
FAPB	Dixmude ...	Air	FAVH	Victor Hugo ...	Ship
FAPC	Maurice Callot	Ship	FAVI	Iskheul ...	Ship
FAPD	Aube FAPD ...	Ship	FAVL	Vinh-Long ...	Ship
FAPE	Peronne ...	Ship	FAVR	Le Verrier ...	Ship
FAPG	Peau-Rouge ...	Ship	FAVW	Torpilleur 366...	Ship
FAPH	Amphitrite ...	Ship	FAVX	Vigoureux ...	Ship
FAPI	Datura ...	Ship	FAWB	Brave ...	Ship
FAPK	Fougueux ...	Ship	FAWH	Torpilleur 330...	Ship
FAPL	Gavres ...	Ship	FAWM	Milon ...	Ship
FAPM	Marguerite VI	Ship	FAWO	C.35 ...	Ship
FAPN	Daphné FAPN	Ship	FAWS	Torpilleur 360...	Ship
FAPO	Pothuau ...	Ship	FAWY	Frêne ...	Ship
FAPR	Primevère ...	Ship	FAXB	Metz ...	Ship
FAPT	Du-Petit-Thouars	Ship	FAXE	Colmar Faxe ...	Ship
FAPV	Paulownia ...	Ship	FAXH	Amiral Senes ...	Ship
FAPX	Perce-Neige ...	Ship	FAXI	Infatigable ...	Ship
FAPZ	Petrel ...	Ship	FAXJ	Delage ...	Ship
FAQB	Bœuf ...	Ship	FAXK	Rageot-de-la- Touche ...	Ship

FAXL C.65 ... Ship
 FAXM Vesco ... Ship
 FAXN France FAXN ... Ship
 FAXO Deligny ... Ship
 FAXP Chastang ... Ship
 FAXQ Elan ... Ship
 FAXR Mazare ... Ship
 FAXS Strasbourg ... Ship
 FAXT Buino ... Ship
 FAXU Pierre Durand ... Ship
 FAXY Thionville ... Ship
 FAXZ Matelot-Leblanc ... Ship
 FAYG C.77 ... Ship
 FAYJ Jules-Ferry ... Ship
 FAYM Amarante FAYM ... Ship
 FAYP Pintade ... Ship
 FAYR Renée ... Ship
 FAYU C.28 ... Ship
 FAYW C.60 ... Ship
 FAZD Torpilleur 336... Ship
 FAZE Escaut FAZE ... Ship
 FAZH C.62 ... Ship
 FAZO Romazotti ... Ship
 FAZS C.25 ... Ship
 FAZU Zébu ... Ship
 FAZV Frondeur ... Ship
 FBA Panthere ... Ship
 FBA Grand-Bassam ... Ship
 FBB Cap. Fagnet ... Ship
 FBC Normandie ... Ship
 FBD Simon Duhamel ... Ship
 FBF Eglantine FBF ... Ship
 FBG Lavardin ... Ship
 FBH Marne FBH ... Ship
 FBI Jules Henry ... Ship
 FBJ Jupiter FBJ ... Ship
 FBL Baleines (Les) ... Ship
 FBM Sagittaire ... Ship
 FBN Chassiron ... Ship
 FBO Marguerite Marie ... Ship
 FBP Mossi ... Ship
 FBQ Général Dodds ... Ship
 FBR Picorre ... Ship
 FBS Chislaine ... Ship
 FBT Doucouëdic FBT ... Ship
 FBU Uranus... ... Ship
 FBV Sambre(La)FBV ... Ship
 FBW Harle ... Ship
 FBX Bisson FBX ... Ship
 FBY Bois des Buttes ... Ship
 FBZ Damier ... Ship
 FBAC Baccarat FBAC ... Ship
 FBAG Algérien ... Ship
 FBAI Aisne ... Ship
 FBAK C.46 ... Ship
 FBAM Annamite ... Ship
 FBAP Apache FBAR ... Ship
 FBAR Ardent ... Ship
 FBAT Batailleuse ... Ship
 FBAV Aventurier ... Ship
 FBAX Faisan ... Ship
 FBAZ Amazone FBAZ ... Ship
 FBCA Calais ... Ship
 FBCE Erable ... Ship
 FBCH Champlain ... Ship
 FBCM Cimeterre ... Ship
 FBCO Colombe ... Ship
 FBCQ Casque ... Ship
 FBCT Coëtlogon ... Ship

FBCV ... Ship
 FBCY ... Ship
 FBCZ ... Ship
 FBDC ... Ship
 FBDG ... Ship
 FBDH ... Ship
 FBDK ... Ship
 FBDL ... Ship
 FDBN ... Ship
 FBDQ ... Ship
 FBDU ... Ship
 FBDV ... Ship
 FBDZ ... Ship
 FBEC ... Ship
 FBEL ... Ship
 FBET ... Ship
 FBEV ... Ship
 FBEY ... Ship
 FBEZ ... Ship
 FBGD ... Ship
 FBGH ... Ship
 FBGI ... Ship
 FBGM ... Ship
 FBGP ... Ship
 FBGS ... Ship
 FBGV ... Ship
 FBHA ... Ship
 FBHC ... Ship
 FBHD ... Ship
 FBHI ... Ship
 FBHM ... Ship
 FBHO ... Ship
 FBHP ... Ship
 FBHR ... Ship
 FBHT ... Ship
 FBHZ ... Ship
 FBIC ... Ship
 FBID ... Ship
 FBIK ... Ship
 FBIO ... Ship
 FBIQ ... Ship
 FBIS ... Ship
 FBIX ... Ship
 FBJE ... Ship
 FBJI ... Ship
 FBJL ... Ship
 FBJS ... Ship
 FBJU ... Ship
 FBKD ... Ship
 FBKH ... Ship
 FBKL ... Ship
 FBKN ... Ship
 FBKP ... Ship
 FBKR ... Ship
 FBKY ... Ship
 FBKZ ... Ship
 FBLA ... Ship
 FBLC ... Ship
 FBLG ... Ship
 FBLK ... Ship
 FBLL ... Ship
 FBLQ ... Ship
 FBLS ... Ship
 FBLT ... Ship
 FBLU ... Ship

Cavalier ... Ship
 Coucy FBCY ... Ship
 Capricieux ... Ship
 Du Chaffault ... Ship
 Duguay-Trouin ... Ship
 Dehorter ... Ship
 Ducouëdic ... Ship
 FBDK ... Ship
 Diligente ... Ship
 Dédaigneuse ... Ship
 C.91 ... Ship
 Dubourdieu ... Ship
 Dumont ... Ship
 D'Urville ... Ship
 C.47 ... Ship
 Conquérante ... Ship
 Commandant ... Ship
 Lucas ... Ship
 Bellatrix FBET ... Ship
 Eveillé ... Ship
 Enseigne-Henry ... Ship
 Torpilleur 351... Ship
 Décidée ... Ship
 Héron II ... Ship
 Agile ... Ship
 Méhari ... Ship
 Polyphème ... Ship
 Gracieuse ... Ship
 Glaive ... Ship
 Hamelin ... Ship
 Carquois ... Ship
 C.32 ... Ship
 Henriette FBHI ... Ship
 Homard ... Ship
 Hova ... Ship
 Hippopotame ... Ship
 Aspirant-Herbert ... Ship
 Hêtre ... Ship
 Fracas ... Ship
 Inconstant FBIC ... Ship
 C.89 ... Ship
 Inca ... Ship
 Cassiopée ... Ship
 Belliquesse ... Ship
 Bisson FBIS ... Ship
 Fanfare ... Ship
 Epernay ... Ship
 Impétueuse ... Ship
 Mécanicien ... Ship
 Principal Lestin ... Ship
 Sans-Souci ... Ship
 C.70 ... Ship
 Audacieuse ... Ship
 Sakalave ... Ship
 Flambart ... Ship
 Tonkinois ... Ship
 Poignard ... Ship
 Renard ... Ship
 Kabyle... ... Ship
 C.90 ... Ship
 Alerte ... Ship
 Curieuse ... Ship
 Gélinothe ... Ship
 Mameluk ... Ship
 Laperouse FBLL ... Ship
 Lansquenet ... Ship
 Lassigny ... Ship
 Altaïr FBLT ... Ship
 Luronne ... Ship

FBLV	Loup-Cervier ...	Ship	FBHT	Tahure ...	Ship
FB LZ	Courageux ...	Ship	FBTL	Toul FBTL ...	Ship
FBMA	Antarès FBMA	Ship	FBTM	Magon ...	Ship
FBMD	C.95 ...	Ship	FBTU	Tumulte ...	Ship
FBMG	Mangini ...	Ship	FBUG	C.102 ...	Ship
FBMH	Mammouth ...	Ship	FBUI	Suippe ...	Ship
FBMI	Montmirail ...	Ship	FBUJ	C.103 ...	Ship
FBML	Mistral ...	Ship	FBUM	C.104 ...	Ship
FBMO	Mondement ...	Ship	FBUN	C.105 ...	Ship
FBMR	Bambara ...	Ship	FBUO	C.106 ...	Ship
FBMU	Massue ...	Ship	FBUQ	C.107 ...	Ship
FBNC	Ancre ...	Ship	FBUR	C.108 ...	Ship
FBNH	C.66 ...	Ship	FBUS	C.109 ...	Ship
FBNL	Torpilleur 266...	Ship	FBUT	C.110 ...	Ship
FBNM	Mortier ...	Ship	FBUV	C.67 ...	Ship
FBNS	Torpilleur 337...	Ship	FBUX	C.86 ...	Ship
FBNT	Engageante ...	Ship	FBUY	C.111 ...	Ship
FBNV	Vacarme ...	Ship	FBUZ	Torpilleur 321...	Ship
FBNZ	Guepe ...	Ship	FBVA	Vaillante ...	Ship
FBOD	Marocain ...	Ship	FBVC	C.112 ...	Ship
FBOD	C.68 ...	Ship	FBVD	Verdun FBVD	Ship
FBOI	Oise FBOI ...	Ship	FBVH	La Hire ...	Ship
FBOK	Torpilleur 327...	Ship	FBVJ	C.74 ...	Ship
FBOL	Loup ...	Ship	FBVK	C.113 ...	Ship
FBOM	Somali FBOM	Ship	FBVL	Vitry-le- François ...	Ship
FBOP	Opiniâtre ...	Ship	FBVM	Malicieuse ...	Ship
FBOU	Bouclier ...	Ship	FBVN	C.114 ...	Ship
FBOY	Torpilleur 315...	Ship	FBVO	C.115 ...	Ship
FBOZ	C.94 ...	Ship	FBVQ	Vauquois ...	Ship
FBPA	Ailette ...	Ship	FBVS	C.116 ...	Ship
FBPE	Pertuisane ...	Ship	FBVT	Trident FBVT	Ship
FBPG	Primauguet ...	Ship	FBVY	Ville d'Ys ...	Ship
FBPL	Peuplier ...	Ship	FBWA	Aigle ...	Ship
FBPM	Papaume ...	Ship	FBWC	Claymore FBWC	Ship
FBPN	Paon ...	Ship	FBWD	Beautemps- Beaupre ...	Ship
FBPO	Emporté ...	Ship	FBWG	Boussole ...	Ship
FBPR	Protêt ...	Ship	FBWH	Hardi ...	Ship
FBPS	Séduisant ...	Ship	FBWI	Intrépide ...	Ship
FBPT	Tintamarre ...	Ship	FBWK	Alidade ...	Ship
FBQK	C.98 ...	Ship	FBWM	Marcassin ...	Ship
FBQL	C.92 ...	Ship	FBWR	Ramier ...	Ship
FBQM	Meuse ...	Ship	FBXA	Arras FBXA ...	Ship
FBQO	Orme ...	Ship	FBXE	Etourdi ...	Ship
FBQR	Régulas FBQR	Ship	FBXG	Francis-Garnier	Ship
FBQS	Sirocco...	Ship	FBXM	Moqueuse ...	Ship
FBQW	C.75 ...	Ship	FBXR	Enseigne-Roux	Ship
FBQX	Torpilleur 369...	Ship	FBXU	Torpilleur 339...	Ship
FBRA	Arabe ...	Ship	FBYC	Capitaine-Mehl	Ship
FBRE	Reims FBRE ...	Ship	FBYG	Torpilleur 349...	Ship
FBRH	Rhinoceros ...	Ship	FBYP	Torpilleur 310...	Ship
FBRI	Commandant Rivière ...	Ship	FBYR	Yser FBYR ...	Ship
FBRM	Remiremont ...	Ship	FBZM	Marne FBZM ...	Ship
FBRU	Robuste ...	Ship	FBZQ	C.69 ...	Ship
FBRY	Commandant Bory...	Ship	FBZT	Téméraire ...	Ship
FB SA	Sape ...	Ship	FBZW	C.97 ...	Ship
FBSC	Scarpe ...	Ship	FBZY	Fier ...	Ship
FB SG	Sanglier ...	Ship	FCA	My-Tho ...	Fr. Indo- China
FB SI	Sioux ...	Ship	FCA	Cape St. James	Fr. Indo- China
FB SL	Sénégalais ...	Ship	FCB	Bougainville ...	Ship
FB SM	Marbre ...	Ship	FCB	Cac-Ba ...	Ship
FB SN	Sentinelle ...	Ship	FCC	Ceylan ...	Ship
FB SO	Somme FB SO...	Ship	FCD	Dupleix FCD ...	Ship
FB SP	Spahi ...	Ship	FCE	Amiral-Duperré	Ship
FB SV	Surveillante ...	Ship	FCF	Amiral Fouri- chon ...	Ship
FB SW	Torpilleur 318	Ship			
FB TA	Tapageuse ...	Ship			
FB TG	Toureg ...	Ship			

FCG	Amiral Rigault de Genouilly	Ship	FEO	Ouessant (Pen- ar-Roch) ...	France
FCH	Amiral Gan- teume ...	Ship	FEP	Penmarch ...	France
FCI	Amiral Latouche- Tréville ...	Ship	FEQ	Setié - Meriem - Gonio ...	Tunis
FCJ	Amiral Jauré- guiberry ...	Ship	FEQ	Bizerte... ..	Tunis
FCK	Caravellas ...	Ship	FER	Pointe du Raz... ..	France
FCL	Amiral Sallan- drouze de Lamornaix ...	Ship	FES	Soubise-Gonio... ..	France
FCM	Malte ...	Ship	FES	Rochfort ...	France
FCN	Aden ...	Ship	FET	Treguier ...	France
FCO	Konakri ...	French W. Africa	FEX	Trinité - Gonio (La	France
FCP	Ango ...	Ship	FEX	Brest, La Trinite	France
FCQ	Tchad ...	Ship	FEZ	S. Nazaire ...	France
FCR	Asie, FCR ...	Ship	FFA	Alger T.S.F. ...	France
FCS	Campinas FCS	Ship	FFB	Boulogne - Sur - Mer T.S.F. ...	France
FCT	Amiral Troude	Ship	FFC	Cherbourg - Rouges-Terres	France
FCU	Europe ...	Ship	FFC	Bonifacio T.S.F.	France
FCV	Amiral Villaret- Joyeuse ...	Ship	FFD	Dunkerque - Castlenau ...	France
FCW	Ouessant ...	Ship	FFF	Ouessant -Gonio	France
FCX	Amiral Nielly	Ship	FFH	Havre (Le) T.S.F.	France
FCY	Amiral Ponty ...	Ship	FFI	Dieppe ...	France
FCZ	Adrar ...	Ship	FFK	Brest ...	France
FDA	Dakar ...	French W. Africa	FFL	Lorient - Pen - Mané ...	France
FDB	La Coubre ...	Ship	FFM	Lorient-Gonio... ..	France
FDC	Guebwiller ...	Ship	FFM	Marseille T.S.F.	France
FDD	Chanchardon II	Ship	FFN	Marseille ...	France
FDE	Capricorne ...	Ship	FFR	Nice T.S.F. ...	France
FDG	Diégo-Suarez ...	Madagascar	FFS	Rocheftort - Sur - Mer ...	France
FDH	Rochebonne ...	Ship	FFT	S. Marie de la Mer, T.S.F. ...	France
FDJ	Dunarea FDJ ...	Ship	FFU	Cap-Bon ...	Tunis
FDL	Stella FDL ...	Ship	FFX	Ouessant T.S.F.	France
FDM	Richelieu ...	Ship	FFX	Bouscat (Bord- eaux) ...	France
FDN	Marthe ...	Ship	FFY	Bordeaux T.S.F.	France
FDO	Dzaoudzi ...	Madagascar	FFZ	Makatea ...	Fr. Oceania
FDP	Phocéen ...	Ship	FGA	Shanghai ...	China
FDQ	Montjoie ...	Ship	FGB	Biskra ...	Ship
FDR	Colmar FDR ...	Ship	FGC	Ville de Bône ...	Ship
FDS	Shamrock FDS	Ship	FGD	Cantal ...	Ship
FDT	Outreau ...	Ship	FGE	Duc D'Aumale	Ship
FDU	Saverne ...	Ship	FGE	La Fayette ...	Ship
FDV	Ribeauville ...	Ship	FGF	Flandre FGF ...	Ship
FDY	Hohneck ...	Ship	FGG	Paris FGG ...	Ship
FDZ	Craonne II ...	Ship	FGH	Haïti FGH ...	Ship
FEB	Bernières ...	France	FGI	Mississipi ...	Ship
FED	Berre-Bouche- du-Rhône ...	France	FGJ	S. Jean ...	Ship
FED	Berre ...	France	FGK	Abd-el-Kader ...	Ship
FEE	Brest, La Trinite	France	FGL	Ville de Nantes	Ship
FEG	Guipavas-Gonio	France	FGM	Ville de Madrid	Ship
FEI	Moulin du Seig- neur-Gonio ...	France	FGN	Nièvre (La) ...	Ship
FEI	Brest, Moulin du Seigneur ...	France	FGO	Loango ...	Fr. Equat. Africa
FEJ	Jijelli ...	France	FGP	Eugène Péreire	Ship
FEL	Marseille ...	France	FGQ	Oudjda ...	Ship
FEM	Toulon ...	France	FGR	Charles Roux... ..	Ship
FEM	Mitre Gonio (La)	France	FGS	Moïse ...	Ship
FEM	Brest, Moulin du Seigneur... ..	France	FGT	Ville de Tunis	Ship
FEN	Gris Nez ...	France	FGU	Puerto-Rico ...	Ship
FEO	Ouessant (Ushant) ...	France	FGV	Aube FGV ...	Ship
			FGW	Vermont FGW	Ship
			FGX	Kentucky FGX	Ship
			FGY	MaréchalBugeaud	Ship

FGZ	Ville D'Oran		FJM	Madonna ...	Ship
FGBL	FGZ ...	Ship	FJP	Patria FJP ...	Ship
FHA	Algol ...	Ship	FJR	Roma FJR ...	Ship
FHB	Afrique II ...	Ship	FJS	Syria FJS ...	Ship
	Notre-Dame de		FJX	S. Marguerite II	Ship
	Lourdes ...	Ship	FKA	Kienan... ..	Fr. Indo China
FHC	Charlotte FHC	Ship			
FHD	S. Jean FHD...	Ship	FKB	Sybil ...	Ship
FHE	Emmanuella ...	Ship	FKD	Destrellan ...	Guade- loupe
FHF	France FHF ...	Ship			
FHG	Gabriella ...	Ship	FKE	Carnoules ...	Ship
FHH	Henriette FHH	Ship	FKF	Cavallaire ...	Ship
FHI	Asie FHI ...	Ship	FKG	Guéthary ...	Ship
FHJ	Jeannot ...	Ship	FKH	Homécourt ...	Ship
FHK	Slack ...	Ship	FKI	Irouléguy ...	Ship
FHL	Lieut. Robert		FKJ	Villeneuve ...	Ship
	Mory ...	Ship	FKK	Vence ...	Ship
FHM	Marie Rose FHM	Ship	FKM	Cogolin ...	Ship
FHO	Antoinette ...	Ship	FKN	Guichen ...	Ship
FHP	Lillois ...	Ship	FKO	Desirade ...	Ship
FHQ	Rorqual ...	Ship	FKP	Eubee ...	Ship
FHR	Rosemonde ...	Ship	FKQ	Fort de France	Martinique
FHS	Marie-Stella ...	Ship	FKR	Kersaint ...	Ship
FHT	Somme FHT ...	Ship	FKS	Casamance ...	Ship
FHU	Automne ...	Ship	FKT	Lipari ...	Ship
FWH	Wimereux ...	Ship	FKU	D'Entrecasteaux	Ship
FHX	Patrie FHX ...	Ship	FKW	Monette FKW	Ship
FHY	Rosita ...	Ship	FKX	Roubaix ...	Ship
FHZ	Inés ...	Ship	FKY	Hendaye ...	Ship
FIA	Titan FIA ...	Ship	FKZ	Cyclone FKZ ...	Ship
FIB	Bosphore ...	Ship	FLA	Ville du Havre	Ship
FIC	Caucase ...	Ship	FLB	Ville de Metz ...	Ship
FID	Danube FID ...	Ship	FLD	Condé FLD ...	Ship
FIE	Hercule ...	Ship	FLE	Wilfred FLE ...	Ship
FIF	Olympe ...	Ship	FLF	Ville de Stras- bourg ...	Ship
FIG	Kouang-Si ...	Ship			
FIH	Ispahan ...	Ship	FLG	Eugène Grosos	Ship
FIJ	Flore ...	Ship	FLH	Havraise ...	Ship
FIK	Docteur Pierre		FLI	Ville de Majunga	Ship
	Benoit ...	Ship	FLJ	Jumièges ...	Ship
FIL	Jupiter FIL ...	Ship	FLK	Anglet ...	Ship
FIM	Imérina ...	Ship	FLL	Ville de Rouen	Ship
FIN	Bacchus FIN ...	Ship	FLM	Ville de Rheims	Ship
FIQ	Sidon ...	Ship	FLN	Ile de la Ré- union ...	Ship
PIP	Jean Stern ...	Ship			
FIQ	Miquelon ...	St. Pierre & Miquelon	FLO	Ville D'Oran	Ship
		Is.	FLP	Ville de Paris ...	Ship
FIR	Phoebus ...	Ship	FLQ	Ville de	
FIS	Commandant			Tamatave ...	Ship
	Dorise ...	Ship	FLR	Ville D'Arras ...	Ship
FIT	Galantry ...	St. Pierre & Miquelon	FLS	Ville de Marseille	Ship
		Is.	FLT	Tourane ...	Fr. Indo China
FIU	Pomone ...	Ship	FIU	Mutsamudu ...	Madagascar
FIV	Venus ...	Ship	FLV	Ville de Verdun	Ship
FIX	Dupleix FIX ...	Ship	FLW	Ville de Djibouti	Ship
Fiy	Lt. de Missiessy	Ship	FLX	Rollon ...	Ship
FIZ	Ars ...	Ship	FLFG	Spitzberg ...	Norway
FJA	Majunga ...	Madagascar	FMA	Monrovia ...	Liberia
FJB	Providence FJB	Ship	FMB	Armand-Béhic	Ship
FJC	Canada FJC ...	Ship	FMC	Chili ...	Ship
FJD	Asia FJD ...	Ship	FMD	Chef Mecanicien	
FJE	Braga ...	Ship		Mailhol ...	Ship
FJG	Britannia FJG	Ship	FME	Lamartine ...	Ship
FJI	Gergovia ...	Ship	FMF	Capitaine Faure	Ship
FJJ	Djibouti ...	Fr. Somali Coast	FMH	Pierre Loti ...	Ship
			FMI	Meinam ...	Fr. Indo China
FJK	Olbia ...	Ship			

FMI	Moncay ...	Fr. Indo China	FOW	Lion FOW ...	Ship
FMJ	Lieut. de la Tour	Ship	FOX	Vauban FOX ...	Ship
FMK	Crimée ...	Ship	FOX	S. Barthélémy	Ship
FML	Lotus ...	Ship	FOZ	Dauphin ...	Ship
FMM	Normand ...	Ship	FOAT	S. Nicolas ...	Ship
FMO	Orénoque ...	Ship	FPA	Anatolie ...	Ship
FMP	Pei-Ho ...	Ship	FPB	Abda ...	Ship
FMQ	Commissaire Pierre Lecocq	Ship	FPC	Circassie ...	Ship
FMR	Cordillière ...	Ship	FDP	Doukkala ...	Ship
FMS	Porthos ...	Ship	FPE	Port-Etienne ...	French W. Africa
FMT	Angkor ...	Ship	FPF	Félix Fraissinet	Ship
FMU	Basque... ...	Ship	FPH	S. Maxime ...	Ship
FMV	Commissaire Ramel ...	Ship	FPI	Rebia ...	Ship
FMW	Amboise ...	Ship	FPJ	Phrygie ...	Ship
FMX	Capitaine Winckler ...	Ship	FPK	Radium ...	Ship
FMY	Bagdad ...	Ship	FPK	Phu-Quoc ...	Fr. Indo China
FMZ	Amazone FMZ	Ship	FPL	Jarlot ...	Ship
FNA	Niger ...	Ship	FPM	Sous ...	Ship
FNB	Bayonne ...	France	FPN	Turenne ...	Ship
FNB	Le Bourget ...	France	FPO	Ionie ...	Ship
FNB	Aviateur Roland Garros ...	Ship	FPP	Thorium ...	Ship
FNC	Nancy ...	France	FPR	Arménie ...	Ship
FND	Dijon ...	France	FPR	Poulo-Condore	Fr. Indo China
FND	Dumbéa ...	Ship	FPS	Gina ...	Ship
FNG	André Lebon ...	Ship	FPT	Aster FPT ...	Ship
FNG	St. Inglevert ...	France	FPU	Tensift ...	Ship
FNK	Antibes ...	France	FPV	Venus FPV ...	Ship
FNK	Kantara (El) ...	Ship	FPW	Souirah ...	Ship
FNL	Louqsor ...	Ship	FPX	Mingrêlie ...	Ship
FNL	Lyon ...	France	FPY	Noun ...	Ship
FNM	Marignane ...	France	FPZ	Draa ...	Ship
FNN	Nîmes... ...	France	FQA	Ardèche ...	Ship
FNP	Paul Lecat ...	Ship	FQC	Caraïbe ...	Ship
FNP	Perpignan ...	France	FQD	Drôme ...	Ship
FNO	Montelimar ...	France	FQE	Basse-Terre ...	Ship
FNR	Romilly-Sur- Seine ...	France	FQG	Géorgie ...	Ship
FNS	Strasbourg ...	France	FQJ	Jeanne D'Arc FQJ ...	Ship
FNT	Toulouse ...	France	FQK	Capitaine Coulon	Ship
FNV	Valenciennes ...	France	FQL	Lamentin ...	Ship
FNW	Pacifique ...	Ship	FQM	Mont-Ventoux	Ship
FNX	Bordeaux ...	France	FQN	Noumea ...	New Calc- donia
FNX	Sphinx ...	Ship	FOO	Orne ...	Ship
FOA	S. Ambroise ...	Ship	FOP	S. Adresse ...	Ship
FOB	S. Basile ...	Ship	FQQ	Michigan FQQ	Ship
FOC	S. Marc ...	Ship	FQR	Pologne ...	Ship
FOD	S. Firmin ...	Ship	FQS	Somme FQS ...	Ship
FOE	S. Prosper ...	Ship	FQT	Texas FQT ...	Ship
FOF	Chauveau ...	Ship	FQW	S. André FQW	Ship
FOH	S. Thomas ...	Ship	FQX	Antilles ...	Ship
FOI	S. Pierre ...	Ship	FQY	Guyane ...	Ship
FOJ	S. Didier ...	Ship	FQZ	Taza ...	Ship
FOK	S. Cyrille ...	Ship	FRA	Liamone ...	Ship
FOL	S. Paul... ...	Ship	FRB	Ibéria ...	Ship
FOM	S. Michel ...	Ship	FRC	Corsica ...	Ship
FON	Menhir ...	Ship	FRD	Bordeaux ...	Ship
FOO	Bois des Caures	Ship	FRE	Ophélie ...	Ship
FOP	Papeete Ile Tahiti ...	Fr. Sett. in Oceania	FRF	S. Marc FRF ...	Ship
FOQ	Bernache ...	Ship	FRG	Angoulême ...	Ship
FOR	Bois de Beaumarais	Ship	FRH	Henry Fraissinet	Ship
FOS	S. Louis FOS ...	Ship	FRI	Tours ...	Ship
FOV	S. Vincent ...	Ship	FRJ	Jaques Fraissinet	Ship
			FRK	Bourges ...	Ship
			FRL	Apollon ...	Ship
			FRM	Saumur ...	Ship

FRN	Numidia ...	Ship	FUK	Oran-ain-el-Turck ...	France
FRP	Blois ...	Ship	FUM	Maine FUM ...	Ship
FRQ	Pé lion ...	Ship	FUN	Lorient ...	France
FRR	Toulouse ...	Ship	FUO	Hourtin ...	France
FRS	Louis Fraissinet	Ship	FUO	Cuers-Pierrefeu	France
FRT	Edouard Shaki	Ship	FUQ	Porquerolles ...	France
FRU	Corte II ...	Ship	FUS	Sfay ...	France
	Rufisque ...	French W. Africa	FUT	Toulon-Mourillon	France
FRV	Vulcain ...	Ship	FUX	Mont-Pelvoux...	France
FRW	Orléans FRW...	Ship	FVA	Savoie FVA ...	Ship
FRY	S. Anne ...	Ship	FVB	Sidi-Brahim ...	Ship
FRZ	S. Nazaire ...	Ship	FVD	Flandre FVD ...	Ship
FSA	Aurigny ...	Ship	FVE	Espagne FVE...	Ship
FSD	Mosella FSD ...	Ship	FVF	Formosa FVF...	Ship
FSF	Formosé ...	Ship	FVH	Sidi-Abdallah ...	Ship
FSG	Garonna ...	Ship	FVI	Guaraja ...	Ship
FSH	Dahomey ...	Ship	FVJ	Valdivia ...	Ship
FSI	Belle Isle ...	Ship	FVK	Ipanema ...	Ship
FSJ	Alesia FSJ ...	Ship	FVL	Plata FVL ...	Ship
FSK	Massilia FSK ...	Ship	FVO	Aquitaine ...	Ship
FSL	Liger ...	Ship	FVP	Mont Viso ...	Ship
FSM	Samara ...	Ship	FVQ	Mendoza ...	Ship
FSN	Fort de Troyon	Ship	FVR	Mont Agel ...	Ship
FSO	Baoulé ...	Ship	FVS	Alsina ...	Ship
FSQ	Zenon ...	Ship	FVT	Rigel FVT ...	Ship
FSR	El Ohio Fasher	Sudan	FVU	Mont Rose FVU	Ship
FSS	Fort de Souville	Ship	FVV	Mont Cervin ...	Ship
FST	Lutetia ...	Ship	FVW	Italie ...	Ship
FSU	Forte de Douaumont	Ship	FVY	Morbihan ...	Ship
FSV	Fort de Vaux ...	Ship	FVZ	Pro Patria ...	Ship
FSW	Heliotrope FSW	Ship	FWA	Fort Bayard ...	Fr. Indo China
FSX	Giroflee ...	Ship			
FTA	Tabu ...	French W. Africa	FWA	Quang-Tcheou-Wan...	China
FTC	Caravelle ...	Ship	FWA	Kwangchow Wan	China
FTD	La Pérouse FTD	Ship	FWB	Alsace FWB ...	Ship
FTE	Espagne FTE	Ship	FWC	Cornelle ...	Ship
FTF	S. Louis FTF	Ship	FWD	Magvy ...	Ship
FTG	Garonne FTG	Ship	FWE	Turkheim ...	Ship
TFH	Hudson ...	Ship	FWF	Shouragallus ...	Ship
FTI	Chicago FTI ...	Ship	FWG	Gafsa ...	Ship
FTJ	Jacques Cartier	Ship	FWH	Denis Papin ...	Ship
FTK	Californie ...	Ship	FWI	Alumine ...	Ship
FTL	Lorraine FTL(La)	Ship	FWK	Frank Delmas	Ship
FTM	Martinique FTM	Ship	FWL	Lapeyrouse ...	Ship
FTO	Caroline ...	Ship	FWM	Emma ...	Ship
FTP	Pérou ...	Ship	FWN	Augustine Isabelle	Ship
FTQ	S. Servan ...	Ship	FWO	La Fontaine ...	Ship
FTR	Rochambeau ...	Ship	FWP	Ulm ...	Ship
FTS	Savoie FTS ...	Ship	FWQ	Quartz ...	Ship
FTT	Touraine ...	Ship	FWR	Château-Palmer	Ship
FTU	Honduras ...	Ship	FWS	Astrée FWS ...	Ship
FTV	Virginie ...	Ship	FWT	Château-Latour	Ship
FTW	De La Salle ...	Ship	FWU	S. Andre FWU	Ship
FTX	Mexico FTX ...	Ship	FWV	André Pierre ...	Ship
FTY	Carbet ...	Ship	FWW	Séphora Worms	Ship
FTZ	France FTZ ...	Ship	FWX	Margaux ...	Ship
FUA	Bizerta... ..	Tunis	FWY	Rene Godet ...	Ship
FUA	Ben-Négro-Gonio	Tunis	FWZ	Suzanne et Marie	Ship
FUC	Mont-Cenis ...	Ship	FXA	Montana FXA	Ship
FUC	Cherbourg ...	France	FXB	Manouba ...	Ship
FUE	Mengam ...	France	FXC	Leopoldina FXC	Ship
FUF	S. Raphaël ...	France	FXD	Maryland FXD	Ship
FUG	Aubagne ...	France	FXE	Oise FXE ...	Ship
FUI	Ajaccio-Aspretto	France	FXF	Félix-Touache...	Ship
FUI	Toulon Liberre	France	FXI	Ontario FXI ...	Ship
			FXJ	S. Joseph ...	Ship

FXK	Lamoricieri ...	Ship	GAR	Chindwara ...	Ship
FXL	Graville ...	Ship	GABC	Adelaide ...	Ship
FXN	Radioléine ...	Ship	GABD	Anzaz ...	Ship
FXO	Notre-Dame de Fourvieres ...	Ship	GABF	Australia GABF	Ship
FXP	Rhin (Le) ...	Ship	GABH	Brisbane ...	Ship
FXQ	Timgad ...	Ship	GABK	Encounter ...	Ship
FXR	Marsa FXR (La)	Ship	GABL	Fantome ...	Ship
FXS	Santarem FXS	Ship	GABM	Geranium ...	Ship
FXS	Marsa (La) ...	Ship	GABN	Huon ...	Ship
FXT	Tafna FXT ...	Ship	GABP	Mallow... ...	Ship
FXU	Missouri FXU	Ship	GABQ	Marguerite GABQ ...	Ship
FXV	Roussillon ...	Ship	GABR	Melbourne GABR ...	Ship
FXW	Capitaine Damiani ...	Ship	GABS	Parramatta ...	Ship
FXX	Volubilis ...	Ship	GABT	Platypus ...	Ship
FXZ	Mansourah FXZ	Ship	GABV	Protector GABV	Ship
FYA	Atmah ...	Ship	GABW	Stalwart ...	Ship
FYB	Amiral Marquer	Ship	GABX	Submarine J.1	Ship
FYD	Labrador ...	Ship	GABY	Submarine J.2	Ship
FYE	Notre-Dame d'Espérance ...	Ship	GABZ	Submarine J.3	Ship
FYF	Eros FYF ...	Ship	GACB	Submarine J.4	Ship
FYG	Louis L.D. ...	Ship	GACD	Submarine J.5	Ship
FYH	Cariol Ier ...	Ship	GACF	Submarine J.7	Ship
FYI	Ariadne FYI ...	Ship	GACH	Success... ...	Ship
FYJ	Sierentz ...	Ship	GACJ	Swan GACJ ...	Ship
FYK	Atlantique ...	Ship	GACK	Swordsman ...	Ship
FYL	Léopold L.D. ...	Ship	GACL	Sydney... ...	Ship
FYM	Maroc ...	Ship	GACM	Tasmania GACM	Ship
FYN	Emilie L.D. ...	Ship	GACN	Tattoo ...	Ship
FYO	Océan FYO ...	Ship	GACP	Torrens ...	Ship
FYP	Imprevu ...	Ship	GACQ	Una ...	Ship
FYQ	Terre-Neuve ...	Ship	GACR	Warrego ...	Ship
FYS	Eros FYS ...	Ship	GACS	Yarra GACS ...	Ship
FYT	Mauritanie ...	Ship	GBB	City of Poona...	Ship
FYU	Résolue ...	Ship	GBC	Coronado GBC	Ship
FYV	Vèga FYV ...	Ship	GBE	Niagara GBE...	Ship
FYV	Notre-Dame des Dunes ...	Ship	GBF	Elswick Grange	Ship
FYW	Savoie FYW ...	Ship	GBG	Nevasa... ...	Ship
FYX	Gaulois... ...	Ship	GBJ	Benalla ...	Ship
FYY	Manche (La) ...	Ship	GBL	Oxford Radio ...	G.B.
FZB	Arlette ...	Ship	GBL	Leafield ...	G.B.
FZD	Monique ...	Ship	GBN	Bloemfontein GBN ...	Ship
FZE	Omphale ...	Ship	GBO	Gorjistan ...	Ship
FZF	Bérénice ...	Ship	GBP	Kasama ...	Ship
FZI	Célimène ...	Ship	GBQ	Nestor ...	Ship
FZJ	Edouard Jéramec	Ship	GBS	Toronto GBS ...	Ship
FZK	Emile Baudot...	Ship	GBT	Colaba ...	Ship
FXL	Cornouaille ...	Ship	GBU	Ulysses... ...	Ship
FZN	Nord ...	Ship	GBV	Cooeyanna ...	Ship
FZO	Antinéa ...	Ship	GBW	City of Karachi	Ship
FZP	Pas-de-Calais ...	Ship	GBX	Arcos ...	Ship
FZQ	Ustaritz ...	Ship	GBY	Kalomo ...	Ship
FZR	Rouen FZR ...	Ship	GBCF	Tredenham ...	Ship
FZS	S. Jehanne ...	Ship	GBCJ	Chemnitz ...	Ship
FZT	Pouyer-Quartier	Ship	GBCK	Meriones ...	Ship
FZW	Marie Louise ...	Ship	GBCL	Bradford City	Ship
FZX	Versailles ...	Ship	GBCM	War Pathan ...	Ship
FZZ	Francaise ...	Ship	GBCN	Wentworth ...	Ship
GB	Glace Bay ...	Canada	GBCP	Leicester ...	Ship
GAB	Homer City ...	Ship	GBCQ	Hesione ...	Ship
GAC	Bangala ...	Ship	GBCR	Cairnavon ...	Ship
GAD	Bharata ...	Ship	GBCS	Lhasa ...	Ship
GAM	Tyne ...	Ship	GBCV	Germanicus ...	Ship
GAN	Eileen ...	Ship	GBCW	Merton Hall ...	Ship
GAO	City of York ...	Ship	GBCX	Ashtabula ...	Ship
GAP	Canara ...	Ship	GBCY	Rubens ...	Ship
			GBDJ	Bermuda ...	Ship

GBDK	City of Auckland	Ship	GBLS	Pendennis ...	Ship
GBDL	Sandgate ...	Ship	GBLT	Penpol ...	Ship
GBDL	Carolus ...	Ship	GBLT	Malmesbury ...	Ship
GBDM	Baron Lovat ...	Ship	GBLV	City of London	
GBDN	City of Lucknow	Ship		GBLV	Ship
GBDP	City of Valencia	Ship	GBLW	Wotan ...	Ship
GBDQ	C. of Alexandria	Ship	GBLY	Woron ...	Ship
GBDR	Mamari ...	Ship	GBLY	Kayeson ...	Ship
GBDT	Manchester City	Ship	GBMC	Knight Compa-	
GBDV	Monica Seed	Ship		nion ...	Ship
GBDW	City of Palermo	Ship	GBMD	Knight Templar	Ship
GBDX	Brockfield ...	Ship	GBMF	Royal City ...	Ship
GBDY	Lorenzo ...	Ship	GBMK	Pakeha ...	Ship
GBDZ	Eastern Prince	Ship	GBML	Nerbudda ...	Ship
GBFC	Lightfoot ...	Ship	GBMN	Glenluss ...	Ship
GBFD	Marengo ...	Ship	GBMP	Wingatui ...	Ship
GBFD	Almeria ...	Ship	GBMQ	Maritime ...	Ship
GBFJ	Miami GBFJ	Ship	GBMR	General Napier	Ship
GBFK	City of Harvard	Ship	GBMT	Austria GBMT	Ship
GBFL	King David ...	Ship	GBMV	Binfield ...	Ship
GBFM	Calypso GBFM	Ship	GBMW	Jason GBMW	Ship
GBFN	Maid of Syra ...	Ship	GBMX	Highlander ...	Ship
GBFO	Branksome Hall	Ship	GBMY	Malvolio ...	Ship
GBFR	Northway ...	Ship	GBNC	Baron Garioch	Ship
GBFS	Maid of Lemnos	Ship	GBND	City of Milan ...	Ship
GBFT	City of Genoa	Ship	GBNF	Sausenburg ...	Ship
GBFV	Arafura ...	Ship	GBNJ	Polo ...	Ship
GBFW	Tresithney ...	Ship	GBNK	Emerald GBNK	Ship
GBFX	Manchurian ...	Ship	GBNL	S. Andrews ...	Ship
GBJD	Waikouaiti ...	Ship	GBMN	Waitemata ...	Ship
GBJL	Plum Branch ...	Ship	GBNP	Grangemouth	Ship
GBJM	Aldgate ...	Ship	GBNQ	Linga ...	Ship
GBJN	Ravensworth ...	Ship	GBNR	Voreda ...	Ship
GBJP	Assyria ...	Ship	GNNR	Rialto ...	Ship
GBJQ	C. of Westminster	Ship	GBNT	Skipsea ...	Ship
GBJR	Bretwalda ...	Ship	GBNV	Galtymore ...	Ship
GBJS	Blairlogie ...	Ship	GBNW	Fulmar ...	Ship
GBJV	Aymeric ...	Ship	GBNX	Quebec City ...	Ship
GBJW	Orteric ...	Ship	GBNY	Herman Sauber	Ship
GBJX	Tymeric ...	Ship	GBNZ	Mary Horlock	Ship
GBJX	Constantinople	Ship	GBPC	Parana GBPC	Ship
GBJY	Manordilo ...	Ship	GBPD	S. Margaret ...	Ship
GBJZ	Paris GBJZ ...	Ship	GBFF	Oehringen ...	Ship
GBKC	Nyanza GBKC	Ship	GBPJ	Tremorvah ...	Ship
GBKD	Perim ...	Ship	GBPL	Den of Airlie ...	Ship
GBKF	Michigan GBKF	Ship	GBPM	Bathurst ...	Ship
GBKJ	Marella ...	Ship	GBPN	Maid of Patras	Ship
GBKL	Orcades ...	Ship	GBPO	Andelle ...	Ship
GBKM	Nankin ...	Ship	GBPR	City of Melbourne	Ship
GBKN	Montreal GBKN	Ship	GBPS	Tasmania ...	Ship
GBKP	Amarapoora ...	Ship	GBPT	Algeria GBPT	Ship
GBKQ	Naneric ...	Ship	GBPV	Pardo ...	Ship
GBKR	Maid of Andros	Ship	GBPW	Sheaf Mount ...	Ship
GBKV	Greenbrier ...	Ship	GBPX	Nasmyth ...	Ship
GBKW	Nore ...	Ship	GBPY	Maid of Chios	Ship
GBKX	Normannia		GBPZ	Trewinnard ...	Ship
	GBKX ...	Ship	GBQC	Glenade ...	Ship
GBKY	Bowes Castle ...	Ship	GBQF	Lunka ...	Ship
GBKZ	Anglo-Colombian	Ship	GBQJ	Haliartus ...	Ship
GBLC	Tremere ...	Ship	GBOL	Cragness ...	Ship
GBLD	Manhattan		GBOM	Barbadian ...	Ship
	GBLD ...	Ship	GBON	Adm. Hamilton	Ship
GBLF	Omar ...	Ship	GBOP	Wangaratta ...	Ship
GBLJ	Matatua ...	Ship	GBOR	Haresfield ...	Ship
GBLK	Lady Killiney	Ship	GBOS	Cranfield ...	Ship
GBLM	Eirene ...	Ship	GBOT	Severn ...	Ship
GBLR	Orsino ...	Ship	GBQV	Somme GBQV	Ship
GBLP	Wordsworth ...	Ship	GBQW	Sabor ...	Ship
GBLR	Kathlamba ...	Ship	GBQX	Radnorshire ...	Ship

GBQY	Narenta ...	Ship
GBQZ	Nebraska GBQZ	Ship
GBRC	Silarus ...	Ship
GBRD	Siris ...	Ship
GBRF	Nictheroy ...	Ship
GBRJ	Syrian Prince	Ship
GBRK	Ballygally Head	Ship
GBRL	Kenbane Head	Ship
GBRM	Mary Amelia ...	Ship
GBRN	Haworth ...	Ship
GBRP	City of Batavia	Ship
GBRQ	T. H. Skogland	Ship
GBRT	Hughli ...	Ship
GBRV	Peru GBRV ...	Ship
GBRW	Flowergate ...	Ship
GBRX	Trevelyan ...	Ship
GBRZ	New Londoner	Ship
GBSD	Prince George	Ship
	GBSD ...	Ship
GBSF	Hecuba ...	Ship
GBSJ	Sinaloa GBSJ	Ship
GBSK	Lord Harrington ...	Ship
GBSL	Potomac GBSL	Ship
GBSM	Iago ...	Ship
GBSN	Charlbury ...	Ship
GBSQ	Masula ...	Ship
GBSR	Thistletoe ...	Ship
GBST	Bata ...	Ship
GBSV	Boma ...	Ship
GBSW	New Brunswick	Ship
GBSX	New Mexico ...	Ship
GBSY	New Georgia ...	Ship
GBSZ	Dun Mail ...	Ship
GBTD	Comeric ...	Ship
GBTF	Croxeth Hall	Ship
GBTJ	Newton GBTJ	Ship
GBTK	Prince Rupert	Ship
GBTL	Quilpue ...	Ship
GBTM	Ramos ...	Ship
GBTN	City of Dunedin	Ship
GBTP	S. Ninian ...	Ship
GBTQ	Ovid ...	Ship
GBTR	Berkut ...	Ship
GBTS	Glenearn ...	Ship
GBTV	Pinot ...	Ship
GBTW	Nuddea ...	Ship
GBTX	Richard Welford	Ship
GBTY	S. E. Calvert ...	Ship
GBTZ	Baron Cawdor	Ship
GBVD	Sardinia ...	Ship
GBVF	Refloater ...	Ship
GBVK	Vasco ...	Ship
GBVK	Talune ...	Ship
GBVL	Scilia GBVL	Ship
GBVM	Carlo ...	Ship
GBVN	Gartland ...	Ship
GBVP	Indore ...	Ship
GBVQ	Bayano ...	Ship
GBVR	Zwulon ...	Ship
GBVS	Rishon ...	Ship
GBVT	Kaimanawa	Ship
GBVW	Inverarder ...	Ship
GBVX	Castilian ...	Ship
GBVY	Grodno ...	Ship
GBVZ	Thurso ...	Ship
GBWC	Obra ...	Ship
GBWD	S. Blas ...	Ship
GBWF	Cape Recife ...	Ship

GBWJ	Sutherland	Ship
	Grange ...	Ship
GBWJ	Hebron ...	Ship
GBWL	Stephan ...	Ship
GBWN	Mardinian ...	Ship
GBWP	Urbino ...	Ship
GBWR	Siam City ...	Ship
GBWS	Fabian ...	Ship
GBWV	Thongwa ...	Ship
GBWV	Cape Cross ...	Ship
GBWX	Maid of Sparta	Ship
GBWY	Phemius ...	Ship
GBWZ	Calderon ...	Ship
GBXC	Cervantes ...	Ship
GBXD	Cortes ...	Ship
GBXF	Chaleur ...	Ship
GBXJ	Suveric ...	Ship
GBXK	Syria GBXK ...	Ship
GBXL	Tara GBXL ...	Ship
GBXM	Penteifi ...	Ship
GBXN	Lord Erskine ...	Ship
GBXP	Kennebec ...	Ship
GBXQ	Bittern GBXQ	Ship
GBXR	Taroba ...	Ship
GBYC	Baron Ogilvy...	Ship
GBYD	Clan Macnab ...	Ship
GBYJ	Shandon ...	Ship
GBYL	Vulcan City ...	Ship
GBYM	Pentaff... ...	Ship
GBYP	Piako ...	Ship
GBYQ	Kittiwake ...	Ship
GBYR	City of Oxford...	Ship
GBYS	Teesta ...	Ship
GBVS	Tamora ...	Ship
GBYT	Tonawanda ...	Ship
GBYV	Bulgarian ...	Ship
GBYW	Okara ...	Ship
GBYX	Antiope ...	Ship
GBYZ	Gothic ...	Ship
GBZC	Starlight ...	Ship
GBZD	Merkara ...	Ship
GBZK	Glenbeg ...	Ship
GBZL	Vasari ...	Ship
GBZM	Roseric ...	Ship
GBZN	Cassio ...	Ship
GBZQ	Magellan ...	Ship
GBZS	Royston Grange	Ship
GBZV	Leighton ...	Ship
GBZW	Berengaria ...	Ship
GBZX	King Alexander	Ship
GBZY	Stakesby ...	Ship
	Cape Point ...	Ship
GCA	Tobermory Rad.	G.B.
GCB	Lochboisdale	
	Radio ...	G.B.
GCC	Cullercoats ...	G.B.
GCD	Nagoya ...	Ship
GCE	Custodian ...	Ship
GCF	Dilwara ...	Ship
GCH	Bankura ...	Ship
GCI	Wayfarer ...	Ship
GCI	Ardeola ...	Ship
GCK	Valentia Radio	G.B.
GCL	Borderer ...	Ship
GCM	Barala ...	Ship
GCS	Caistor - on -Sea	
	Radio ...	G.B.
GCT	Barjora ...	Ship
GCV	Neuralia ...	Ship

GCW	Novara ...	Ship	GCLF	Nardana ...	Ship
GCX	Waroonga ...	Ship	GCLJ	Kastalia ...	Ship
GCY	Poleric ...	Ship	GCLM	Glenariffe ...	Ship
GCZ	Euryalus ...	Ship	GCLN	Otaki ...	Ship
GCAD	Aurora ...	Ship	GCLP	Zelo ...	Ship
G CBD	Albion Star ...	Ship	GCLQ	S. Sunniva ...	Ship
GCBF	Portfield ...	Ship	GCLR	Curraghmore ...	Ship
GCBJ	Surrey ...	Ship	GCLS	Ronalee ...	Ship
GCBK	Whitby Abbey ...	Ship	GCLT	Keelung ...	Ship
GGBL	Browning ...	Ship	GCLV	New Toronto ...	Ship
GGBM	Bruyere ...	Ship	GCLW	New Texas ...	Ship
GGBN	Maindy Priory ...	Ship	GCLX	Halo GCLX ...	Ship
GGBP	Treverbyn ...	Ship	GCLZ	Montazah ...	Ship
GGBR	Beechpark ...	Ship	G CMB	Mahmoudieh ...	Ship
GGBS	Peshawur ...	Ship	G CMD	Monassir ...	Ship
GGBT	S. Bede ...	Ship	G CMF	Matama ...	Ship
GGBV	S. Andrew ...	Ship	GCMJ	Philadelphian ...	Ship
	GCBV ...	Ship	GCMK	Anglia GCMK...	Ship
GCBW	Goalpara ...	Ship	G CML	Hibernia G CML	Ship
GCBX	Harmodius ...	Ship	GCMN	Gondia ...	Ship
GCBY	Montrose GCBY	Ship	G CMP	Hallside ...	Ship
GCBZ	Backworth ...	Ship	GCMQ	River Dare ...	Ship
G CDB	Coatsworth ...	Ship	G C MR	Gandara ...	Ship
G CDF	Umtata ...	Ship	G C MS	Garada... ..	Ship
G CDK	Woodarra ...	Ship	G CMT	Cyprian Prince	Ship
G CDK	Kawatiri ...	Ship	G C MV	Trekieve ...	Ship
G CDL	Hornchurch ...	Ship	G C MW	Trewyn ...	Ship
G C DN	Housatonic		G C MX	King Alfred ...	Ship
	G C DN ...	Ship	G C MY	Algerian ...	Ship
G C DP	Gharinda ...	Ship	G C MZ	Sunpath ...	Ship
G C DQ	Dagenham ...	Ship	G C NB	Bolivian ...	Ship
G C DR	Admiral Hastings	Ship	G C ND	Applebranch ...	Ship
G C DS	S. Rognvald ...	Ship	G C NF	Ixia ...	Ship
G C DT	Kapurthala ...	Ship	G C NJ	Pinar del Rio ...	Ship
G C DV	Sambre G C DV	Ship	G C NK	Riposto ...	Ship
G C DW	Sarthe ...	Ship	G C NL	Emlynian ...	Ship
G C DX	Tregenna ...	Ship	G C NM	Belgian ...	Ship
G C DY	Kaiwarra ...	Ship	G C NP	Somerton ...	Ship
G C DZ	Hunstanworth ...	Ship	G C NQ	Port Kembla ...	Ship
G C FB	Benvorlich ...	Ship	G C NR	Port Adelaide	Ship
G C FD	Onega ...	Ship	G C NS	Natia ...	Ship
G C FJ	Port Curtis ...	Ship	G C NT	Nariva ...	Ship
G C JP	Henri Deutsch de la Meurthe	Ship	G C NV	Empress of India	Ship
	Ormuz ...	Ship	G C NW	Grangepark ...	Ship
G C JR	Emile Deutsch		G C NY	Waikawa ...	Ship
G C JS	de la Meurthe	Ship	G C NZ	Danier ...	Ship
	Dunstaffnage ...	Ship	G C PA	Patrician G C PA	Ship
G C JW	Darian ...	Ship	G C PB	Turcoman ...	Ship
G C JX	Fernmoor ...	Ship	G C PD	Welshman ...	Ship
G C JY	S. Roberto ...	Ship	G C PF	City of Bristol	Ship
G C JZ	Ciscar ...	Ship	G C PJ	City of Benares	Ship
G C KB	Colon G C KD	Ship	G C PK	City of Calcutta	Ship
G C KD	Arana ...	Ship	G C PL	Hymettus ...	Ship
G C KF	Almargo ...	Ship	G C PM	Katuna ...	Ship
G C KJ	Alvarado ...	Ship	G C PN	Kabinga ...	Ship
G C KL	Canonesa ...	Ship	G C PQ	Surat ...	Ship
G C KM	Golconda ...	Ship	G C PR	Kathiawar ...	Ship
G C KP	Sheaf Garth ...	Ship	G C PS	City of Lahore	Ship
G C KQ	Lancaster Castle	Ship	G C PT	City of Naples	Ship
G C KR	Neotsfield ...	Ship	G C PV	Valiant ...	Ship
G C KS	Hazelside ...	Ship	G C PW	City of Durham	Ship
G C KT	Trelyon ...	Ship	G C PX	City of London	
G C KV	Harmonides ...	Ship		G C PX ...	Ship
G C KW	Halizones ...	Ship	G C PY	City of Marseilles	Ship
G C KX	Knockfierna ...	Ship	G C PZ	Bronte G C PZ ...	Ship
G C KY	Silvia ...	Ship	G C QB	Balfe ...	Ship
G C KZ	Gogra ...	Ship	G C QK	Agadir ...	Ship
G C LB	Gorala ...	Ship	G C QL	Torontonian ...	Ship
G C LD			G C QM	Amber ...	Ship

GCON	Bedebern ...	Ship	GCVW	War Sirdar ...	Ship
GCQP	Buccinum ...	Ship	GCVX	Reliant ...	Ship
GCQR	Angora ...	Ship	GCVY	Restorer GCVY	Ship
GCQS	Appalachee ...	Ship	GCVZ	Padua ...	Ship
GCQT	Arankola ...	Ship	GCWB	Union City ...	Ship
GCQV	Arlanza ...	Ship	GCWK	Glenluce ...	Ship
GCQW	Azila ...	Ship	GCWM	Borelis ...	Ship
GCQX	Berwindvale ...	Ship	GCWN	Highland Warrior	Ship
GCQY	Gambhira ...	Ship	GCWP	Shahristan ...	Ship
GCQZ	Braemar Castle	Ship	GCWQ	Glentara ...	Ship
GCRB	Britannia GCRB	Ship	GCWR	Vittoria GCWR	Ship
GCRD	Erlesburgh ...	Ship	GCWS	Truro City ...	Ship
GCRF	Cawdor Castle	Ship	GCWT	Umvolosi ...	Ship
GCRK	Cheyenne GCRK	Ship	GCWV	Uskmouth ...	Ship
GCRL	Chile GCRL ...	Ship	GCWX	Tapti ...	Ship
GCRM	Arabic ...	Ship	GCWY	Lord	
GCRN	Cluny Castle ...	Ship		Londonderry	Ship
GCRP	Coconada ...	Ship	GCWZ	Trelewan ...	Ship
GCRQ	Comanche ...	Ship	GCTX	Madasor ...	Ship
GCRS	Commonwealth	Ship	GCTX	Glengarry ...	Ship
GCRT	Comrie Castle	Ship	GCTX	Brocktown ...	Ship
GCRV	Darro ...	Ship	GCTX	Whitegate ...	Ship
GCRW	Delaware GCRW	Ship	GCTL	Mecklenburg	
GCRX	Deseado ...	Ship		GCTL ...	Ship
GCRY	Desna ...	Ship	GCTX	Gundreda ...	Ship
GCRZ	Demerara ...	Ship	GCTX	Umku ...	Ship
GCSB	Duendes ...	Ship	GCTX	Umkuzi ...	Ship
GCSO	City of Sydney		GCTX	Mangalore ...	Ship
	GCSO ...	Ship	GCTX	Mathura ...	Ship
GCSF	Egra ...	Ship	GCTX	Manipur ...	Ship
GCSJ	Ekma ...	Ship	GCTX	Lestris GCTX	Ship
GCSK	Elephanta ...	Ship	GCTX	Chiapas ...	Ship
GCSL	Ellenga ...	Ship	GCTX	Corstream ...	Ship
GCSM	Ellora ...	Ship	GCTX	Trevithick ...	Ship
GCSN	Kwai Sang ...	Ship	GCTX	Serbistan ...	Ship
GCSO	Patriot ...	Ship	GCTX	Molton ...	Ship
GCSQ	Paraguay (El)	Ship	GCTX	Western Valleys	Ship
GCSR	Uruguayo (El)	Ship	GCTX	Sunfield ...	Ship
GCSV	Janus ...	Ship	GCTX	Suncliff ...	Ship
GCSW	Diogenes ...	Ship	GCTX	Sunbank ...	Ship
GCSX	Francisco ...	Ship	GCTX	Daybeam ...	Ship
GCSY	Anne ...	Ship	GCTX	Daybreak ...	Ship
GCSZ	Ravenrock ...	Ship	GCTX	Diomed ...	Ship
GCTB	Balzac ...	Ship	GCTX	Philoctetes ...	Ship
GCTC	Empirestar ...	Ship	GCTX	Narragansett	
GCTD	War Krishna ...	Ship		GCTX ...	Ship
GCTE	Clayton ...	Ship	GCTX	Nile GCTX ...	Ship
GCTF	Merganser ...	Ship	GCTX	Heathside ...	Ship
GCTG	Empress of		GCTX	Garbeta ...	Ship
	Scotland ...	Ship	GCTX	Gazana ...	Ship
GCTH	Dandy ...	Ship	GCTX	Gairsoppa ...	Ship
GCTI	Clan Macinnes	Ship	GCTX	Gurna ...	Ship
GCTJ	Lady Duncannon	Ship	GCTX	Gamarla ...	Ship
GCTR	Magiestar ...	Ship	GCTX	Garmula ...	Ship
GCTS	Bonneur ...	Ship	GCTX	War Hindoo ...	Ship
GCTV	Boswell ...	Ship	GCTX	Arundel Castle	Ship
GCTW	Sea Victory ...	Ship	GCTX	Cilurnum ...	Ship
GCTX	Heroic ...	Ship	GCTX	Tairoa ...	Ship
GCTZ	Naldera ...	Ship	GCTX	Ramon de Larri-	
GCVB	Narkunda ...	Ship		naga ...	Ship
GCVD	War Bharata ...	Ship	GCTX	Telesfora de	
GCVF	War Sudra ...	Ship		Larrinaga ...	Ship
GCVK	Assyrian ...	Ship	GCTX	City of Leeds ...	Ship
GCVN	Dernes ...	Ship	GCTX	Notton ...	Ship
GCVP	Ingeborg Larssen	Ship	GCTX	Muristan ...	Ship
GCVQ	Doricstar ...	Ship	GCTX	Roseworth ...	Ship
GCVR	War Afridi ...	Ship	GCTX	Patuca ...	Ship
GCVS	War Brahmin	Ship	GCTX	Fultala ...	Ship
GCVT	Baberton ...	Ship	GCTX	City of Dunkirk	Ship

GDF	Gracchus ...	Ship	GDJW	Zinal ...	Ship
GDG	Tennyson ...	Ship	GDJX	Jutland ...	Ship
GDH	Byron ...	Ship	GDJY	Elvaston ...	Ship
GDJ	Appam ...	Ship	GDKB	Dorsetshire ...	Ship
GDK	Chaudiere ...	Ship	GDKC	Yorkshire ...	Ship
GDL	Baroda ...	Ship	GDKJ	Cranstone ...	Ship
GDN	Kentucky GDN	Ship	GDKL	Clyne Rock ...	Ship
GDO	Colonian ...	Ship	GDKM	Waiotapu ...	Ship
GDP	City of Lincoln	Ship	GDKN	Homecliffe ...	Ship
GDR	Cufic ...	Ship	GDKP	Hertford ...	Ship
GDU	Tropic ...	Ship	GDKQ	City of Bagdad	Ship
GDV	Ingoma ...	Ship	GDKR	Silksworth ...	Ship
GDW	Cornishman ...	Ship	GDKT	Maid of Corfu	Ship
GDX	Isle of Man Radio	G.B.	GDKV	Northerner ...	Ship
GDBC	Achilles GDBC	Ship	GDKW	Hesperia ...	Ship
GDBF	Umsinga ...	Ship	GDKX	Thornbury ...	Ship
GDBJ	Monkton ...	Ship	GDKY	Norfolk GDKY	Ship
GDBK	Thysa ...	Ship	GDKZ	Cesario ...	Ship
GDBM	Mabriton ...	Ship	GDLB	Baltabor ...	Ship
GDBN	Koranton ...	Ship	GDLG	General Milne...	Ship
GDBP	Pilton ...	Ship	GDLF	Cooee GDLF ...	Ship
GDBQ	Waihemo ...	Ship	GDLJ	Homeric ...	Ship
GDBS	Moto ...	Ship	GDLK	Wray Castle ...	Ship
GDBT	Barrymore ...	Ship	GDLN	Porthia ...	Ship
GDBV	Montgomerysh'e	Ship	GDLN	Tuscania ...	Ship
GDBW	Nagpore ...	Ship	GDLQ	Oropesa ...	Ship
GDBX	Kidderpore ...	Ship	GDLR	Paz (La) ...	Ship
GDBY	Jeyapore ...	Ship		Hesperides	
GDBZ	Lahore ...	Ship		GDLR ...	Ship
GDCB	Alipore ...	Ship	GDLT	Vikingstar ...	Ship
GDCF	Glassford ...	Ship	GDLV	Albania GDLV	Ship
GDCJ	Scala Shell ...	Ship	GDLW	Black Sea ...	Ship
GDCK	Maine GDCK ...	Ship	GDLX	Singleton Abbey	Ship
GDCL	Knebworth ...	Ship	GDLY	Colima ...	Ship
GDCM	Dalworth ...	Ship	GDLZ	Kendal Castle	Ship
GDCN	Mauritian ...	Ship	GDMB	Bempton ...	Ship
GDCP	Unda ...	Ship	GDMC	Norwegian ...	Ship
GDCQ	Meropi ...	Ship	GDMF	Elm Park ...	Ship
GDCR	New Brighton	Ship	GDMJ	Accrington ...	Ship
GDCS	New Columbia	Ship	GDMK	Lolworth ...	Ship
GDCT	Chirripo ...	Ship	GDMN	Bristol City ...	Ship
GDCV	Reventazan ...	Ship	GDMN	Ekari ...	Ship
GDCW	Zent ...	Ship	GDMP	Corrientes ...	Ship
GDCX	Trebartha ...	Ship	GDMQ	War Pindari ...	Ship
GDCY	Manistee ...	Ship	GDMR	Antioe ...	Ship
GDCZ	Patia ...	Ship	GDMS	Mashobra ...	Ship
GDFB	Tortugero ...	Ship	GDMT	Mundra ...	Ship
GDFC	Alondra ...	Ship	GDMV	Domala ...	Ship
GDFD	Cano ...	Ship	GDMW	Manela ...	Ship
GDFM	Illingworth ...	Ship	GDMX	Madura ...	Ship
GDFP	Fredrik Larssen	Ship	GDMY	Mantola ...	Ship
GDFQ	Monkstone light	Ship	GDMZ	Matiana ...	Ship
GDFR	Vogtland ...	Ship	GDNB	Malda ...	Ship
GDFS	Lemberg ...	Ship	GDNC	Chantala ...	Ship
GDFT	Venosta ...	Ship	GDNF	Dumana ...	Ship
GDFV	Antwerp ...	Ship	GDNJ	Chilka ...	Ship
GDFW	Cordale ...	Ship	GDNK	Dacre Hill ...	Ship
GDFX	Ave Maria ...	Ship	GDNL	Vaux ...	Ship
GDFZ	Knight Errant	Ship	GDNM	Firpark ...	Ship
GDJB	Rochelie ...	Ship	GDNO	Sirsa ...	Ship
GDJC	Montoro GDJC	Ship	GDNR	Sufada ...	Ship
GDJK	Gerano ...	Ship	GDNS	Cavallo ...	Ship
GDJL	Kara ...	Ship	GDNT	Destro ...	Ship
GDJM	Castelar ...	Ship	GDNV	Guido ...	Ship
GDJN	Kingyuan ...	Ship	GDNW	Runo ...	Ship
GDJO	Cutty Sark ...	Ship	GDNX	City of Brisbane	Ship
GDJR	Corpath ...	Ship	GDNY	Egyptian ...	Ship
GDJT	Benreoch ...	Ship	GDPB	New Brooklyn	Ship
GDJV	Fernhill ...	Ship	GDPC	Indian City ...	Ship

GDPF Andalusier ... Ship
 GDPJ Edavana ... Ship
 GDPK Estrelland ... Ship
 GDPL Greylight ... Ship
 GPPM Ashworth ... Ship
 GDPN Ardena... ... Ship
 GDPQ Cleopatra III ... Ship
 GDPR King Lear ... Ship
 GDPS Machaon ... Ship
 GDPT Calchas ... Ship
 GDPV Clan Mactaggart ... Ship
 GDPW Clan Mactavish ... Ship
 GDPX City of Adelaide ... Ship
 GDPY Sandon Hall ... Ship
 GDPZ Maimoa ... Ship
 GDOB Middlesex ... Ship
 GDQC Balderton ... Ship
 GDQJ Lady Denison ... Ship
 Pender ... Ship
 GDQK Ronda Ship
 GDQL Lys Ship
 GDQM Cornwall ... Ship
 GDQN Lalande ... Ship
 GDQP Hogarth ... Ship
 GDQR Albion Ship
 GDQS Evesham ... Ship
 GDQT H. H. Asquith ... Ship
 GDQV Elswick Park... ... Ship
 GDQW Glenogle ... Ship
 GDQX Princess Ena ... Ship
 GDQY Ardenza ... Ship
 GDRB Tyndale ... Ship
 GDRF Daghestan ... Ship
 GDRK Cordillera ... Ship
 GDRL Filey Ship
 GDRM Jersey City ... Ship
 GDRN Atlantic City ... Ship
 GDRP Paris City ... Ship
 GDRQ Aviemore ... Ship
 GDRS City of Glasgow ... Ship
 GDRT Arbonne ... Ship
 GDRV Cambria GDRV ... Ship
 GDRW Scotia GDRW ... Ship
 GDRX Diadem ... Ship
 GDRY S. Zotico ... Ship
 GDSB Boston City ... Ship
 GDSF Dromore ... Ship
 GDSJ City of Pekin ... Ship
 GDSK Antar Ship
 GDSL Everest ... Ship
 GDSM Scottish Amer. ... Ship
 GDSN City of Durban ... Ship
 GDSP Azeus Ship
 GDSQ Kodrus ... Ship
 GDSR Erginus ... Ship
 GDST Cranford GDST ... Ship
 GDSV Oriflamme ... Ship
 GDSW Aba Ship
 GDSX Madame Midas ... Ship
 GDSY Parisiana ... Ship
 GDSZ Gaslight ... Ship
 GDTB Whitemantle ... Ship
 GDTC Etrib Ship
 GDTF Esneh Ship
 GDTJ Alness Ship
 GDTK Braywood ... Ship
 GDTL Lisbon Ship
 GDTM Dido GDTM ... Ship

GDTN Vulture ... Ship
 GDTQ Magpie ... Ship
 GDTQ Hound ... Ship
 GDTR Pointer... ... Ship
 GDTS Partridge GDTs ... Ship
 GDTV Woodcock GDTV ... Ship
 GDTW Moorfowl ... Ship
 GDTX Tiger GDTX ... Ship
 GDTY Puma Ship
 GDVC Olive Ship
 GDVF Thistle Ship
 GDVJ Brier Ship
 GDVK Inverleith ... Ship
 GDVL Bandon ... Ship
 GDMV Moorfoot ... Ship
 GDMV Melford Hall ... Ship
 GDMV Incemore ... Ship
 GDVQ Shahzada ... Ship
 GDVR Maharaja ... Ship
 GDVS Shah Jehan ... Ship
 GDVT Retriever GDVT ... Ship
 GDVW Vanellus ... Ship
 GDVX Ethel Radcliffe ... Ship
 GDVY Dramatist ... Ship
 GDVZ Moldavia ... Ship
 GDWB Gloxinia ... Ship
 GDWC Cumberland ... Ship
 GDWC Sheaf Arrow ... Ship
 GDWI Bruges ... Ship
 GDWK Baychimo ... Ship
 GDWL Anchorton ... Ship
 GDWM Baltannic ... Ship
 GDWN Glentworth ... Ship
 GDWQ Tredennick ... Ship
 GDWR Trevorian ... Ship
 GDWS Silverlight ... Ship
 GDWT S. Bruno ... Ship
 GDWX Alice Marie ... Ship
 GDWY Mostyn ... Ship
 GDXB Rhexenor ... Ship
 GDXC Baltriger ... Ship
 GDXF Constantia ... Ship
 GDXJ S. Maria ... Ship
 GDXL Lobos Ship
 GDXM Losada ... Ship
 GDXN Clan Macindoe ... Ship
 GDXP S. Gil Ship
 GDXQ Seaham Harbour ... Ship
 GDXR Pays de Waes ... Ship
 GDXS Cameronia ... Ship
 GDXT Glenapp ... Ship
 GDXV Wrangler ... Ship
 GDXW Rotherhill ... Ship
 GDXY Chow Tai ... Ship
 GDXZ Magdapur ... Ship
 GDYB Spanker ... Ship
 GDYC Ford Castle ... Ship
 GDYF Neath Abbey ... Ship
 GDYJ George Ward ... Ship
 GDYK Oswestry ... Ship
 GDYL Ruthenia ... Ship
 GDYM Loch Katrine ... Ship
 GDYN Longhurst ... Ship
 GDYP Seythia ... Ship
 GDYQ Newchang ... Ship
 GDYR Nanchang ... Ship
 GDYT S. Tiburcio ... Ship
 GDYV Malia Ship

GDYW	Eumæus ...	Ship	GECT	Warspite ...	Ship
GDYX	Mayari ...	Ship	GECV	Hood ...	Ship
GDYZ	Glaucus ...	Ship	GECW	Lion GECW ...	Ship
GDZB	Troilus ...	Ship	GECX	Keppel ...	Ship
GDZF	Inkum ...	Ship	GECY	Shikai ...	Ship
GDZJ	Pear Branch ...	Ship	GECZ	Renown ...	Ship
GDZK	S. Leon ...	Ship	GEDB	Repulse ...	Ship
GDZL	Aerolite ...	Ship	GEDC	Tiger GEDC ...	Ship
GDZM	Withernsea ...	Ship	GEDF	Submarine L22	Ship
GDZN	Flamborough ...	Ship	GEDJ	Submarine L23	Ship
GDZP	Somersetshire	Ship	GEDK	Courageous	Ship
GDZO	Lombardy ...	Ship		GEDK ...	Ship
GDZR	Atua ...	Ship	GEDM	Glorious ...	Ship
GDZS	Kurów ...	Ship	GEDN	Submarine L26	Ship
GDZT	Maheno ...	Ship	GEDQ	Birmingham	Ship
GDZW	Manuka ...	Ship		GEDQ ...	Ship
GDZW	Makura ...	Ship	GEDR	Cairo GEDR ...	Ship
GDZX	Maori ...	Ship	GEDS	Calcutta GEDS	Ship
GDZY	Marama ...	Ship	GEDT	Calliope ...	Ship
GEA	GEA ...	Air	GEDV	Calypto GEDV	Ship
GEC	Castle Bromwich		GEDW	Caledon ...	Ship
	Radio ...	G.B.	GEDX	Cambrian	
GED	Croydon Radio	G.B.		GEDX ...	Ship
GEG	Lympe Radio	G.B.	GEDY	Canterbury ...	Ship
GEK	Bickendorf ...	G.B.	GEDZ	Caradoc ...	Ship
		(Rhine)	GEFB	Cardiff GEFB	Ship
GEL	Lerwick Radio	G.B.	GEFC	Carlisle ...	Ship
GEM	Manchester Radio	G.B.	GEFD	Submarine L27	Ship
GEP	Pulham ...	G.B.	GEFJ	Carysfort ...	Ship
GER	Renfrew Radio	G.B.	GEFK	Castor ...	Ship
GEZ	GEZ ...	G.B.	GEFL	Centaur ...	Ship
GEAAB	GEAAB ...	Air	GEFM	Ceres GEFM ...	Ship
GEAPJ	GEAPJ ...	Air	GEFN	Champion ...	Ship
GEARO	GEARO ...	Air	GEFQ	Cleopatra GEFQ	Ship
GEASI	GEASI ...	Air	GEFR	Colombo GEFR	Ship
GEATH	GEATH ...	Air	GEFS	Comus GEFS ...	Ship
GEATK	GEATK ...	Air	GEFT	Concord GEFT	Ship
GEAWO	GEAWO ...	Air	GEFV	Conquest ...	Ship
GEAWW	GEAWW ...	Air	GEFW	Constance ...	Ship
GEAWY	GEAWY ...	Air	GEFX	Cordelia GEFX	Ship
GEBC	Agamemnon		GEFY	Coventry ...	Ship
	GEBC ...	Ship	GEFZ	Curacoa ...	Ship
GEBD	Ajax GEBD ...	Ship	GEJB	Curlew GEJB	Ship
GEBF	Barham ...	Ship	GEJC	Danoe ...	Ship
GEBJ	Benbow ...	Ship	GEJD	Dartmouth ...	Ship
GEBL	Centurion GEBL	Ship	GEJF	Dauntless ...	Ship
GEBN	Colossus ...	Ship	GEJK	Delhi ...	Ship
GEBO	Conqueror ...	Ship	GEJL	Dragon ...	Ship
GEBR	Emperor of India	Ship	GEJM	Dublin ...	Ship
GEBS	Broke ...	Ship	GEJN	Dunedin ...	Ship
GEBT	Diomedes ...	Ship	GEJP	Submarine L53	Ship
GEBV	Iron Duke ...	Ship	GEJO	Hawkins ...	Ship
GEBW	King George V.	Ship	GEJR	Inconstant	
GBX	Malaya GBX	Ship		GEJR ...	Ship
GBY	Marlborough ...	Ship	GEJS	Lowestoft ...	Ship
GBZ	Effingham ...	Ship	GEJT	Submarine L54	Ship
GECB	Emerald GECB	Ship	GEJW	Raleigh GEJW	Ship
GECD	Enterprise		GEJX	Submarine L69	Ship
	GECD ...	Ship	GEJY	Southampton	Ship
GECF	Queen Elizabeth	Ship	GEJZ	Submarine K26	Ship
GECJ	Ramillies ...	Ship	GEKB	Vindictive ...	Ship
GECK	Resolution ...	Ship	GEKC	Weymouth ...	Ship
GECL	Revenge ...	Ship	GEKD	Yarmouth ...	Ship
GECM	Royal Oak ...	Ship	GEKF	Abdiel ...	Ship
GECN	Royal Sovereign	Ship	GEKL	Bruce GEKL ...	Ship
GECP	Frobisher ...	Ship	GEKM	Campbell ...	Ship
GECO	Hermes GECO ...	Ship	GEKN	Douglas GEKN	Ship
GECR	Thunderer ...	Ship	GEKP	Grenville ...	Ship
GECS	Valiant GECS	Ship	GEKQ	Mackay ...	Ship

GEKR Malcolm ... Ship
 GEKS Montrose GEKS ... Ship
 GEKT Nimrod ... Ship
 GEKV Saumarez ... Ship
 GEKW Sevmour ... Ship
 GEKX Shakespeare ... Ship
 GEKY Spenser ... Ship
 GEKZ Stuart ... Ship
 GELB Wallace ... Ship
 GELF Radstock ... Ship
 GELJ Raider ... Ship
 GELK Rapid ... Ship
 GEIM Ready ... Ship
 GFLN Red Gauntlet ... Ship
 GELP Redoubt ... Ship
 GELO Relentless GELQ ... Ship
 GELR Restless GELR ... Ship
 GELS Retriever GELS ... Ship
 GELT Rigorous ... Ship
 GELV Rival ... Ship
 GELW Rocket ... Ship
 GELX Rob Roy ... Ship
 GELY Romala ... Ship
 GELZ Rosalind ... Ship
 GEMB Rowena GEMB ... Ship
 GEMC Sable GEMC ... Ship
 GEMD Sabrina ... Ship
 GEMF Sabre ... Ship
 GEMJ Saladin ... Ship
 GEMK Salmon ... Ship
 GEML Sardonyx ... Ship
 GEMN Sarpedon GEMN ... Ship
 GEMP Satyr ... Ship
 GEMQ Sceptre ... Ship
 GEMR Scimitar ... Ship
 GEMS Scotsman ... Ship
 GEMT Scout ... Ship
 GEMV Scythe ... Ship
 GEMW Seabear ... Ship
 GEMX Seafire ... Ship
 GEMY Searcher ... Ship
 GEMZ Seawolf ... Ship
 GENB Senator GENB ... Ship
 GENC Sepoy ... Ship
 GEND Serapis ... Ship
 GENF Seraph ... Ship
 GENI Serene ... Ship
 GENK Sesame ... Ship
 GENL Shamrock GENL ... Ship
 GENM Shark ... Ship
 GENP Sharpshooter ... Ship
 GENO Sikh GENQ ... Ship
 GENR Simoon ... Ship
 GENS Sirdar ... Ship
 GENT Skate ... Ship
 GENV Skilful ... Ship
 GENW Somme GENW ... Ship
 GENX Sorceress ... Ship
 GENY Sparrowhawk ... Ship
 GENZ Spear ... Ship
 GEPB Speedy ... Ship
 GEPC Spindrift ... Ship
 GEPD Splendid ... Ship
 GEPF Sportive ... Ship
 GEPI Springbok ... Ship
 GEPL Starfish ... Ship
 GEPM Stedfast GEPM ... Ship
 GEPN Sterling GEPN ... Ship
 GEPR Stork GEPR ... Ship

GEPS Stormcloud ... Ship
 GEPT Strenuous ... Ship
 GEPV Stronghold ... Ship
 GEPW Sturdy ... Ship
 GEPX Surgeon ... Ship
 GEPY Submarine XI ... Ship
 GEPZ Swallow GEPZ ... Ship
 GEQC Sylville ... Ship
 GEQD Sylph GEQD ... Ship
 GEQF Tactician ... Ship
 GEQJ Tancred GEQJ ... Ship
 GEQK Tara GEQK ... Ship
 GEQL Tarpon ... Ship
 GEQP Taurus GEQP ... Ship
 GEQR Teazer ... Ship
 GEQS Telemachus ... Ship
 GEQS ... Ship
 GEQT Tempest ... Ship
 GEQV Tenacious ... Ship
 GEQW Tenedos GEQW ... Ship
 GEQX Tetrarch ... Ship
 GEQY Thanet ... Ship
 GEQZ Thisbe ... Ship
 GERB Thruster ... Ship
 GERC Tilbury ... Ship
 GERD Tintagel ... Ship
 GERJ Tomahawk ... Ship
 GERK Torch ... Ship
 GERL Toreador GERL ... Ship
 GERM Tormentor ... Ship
 GERN Torrid ... Ship
 GERP Tourmaline ... Ship
 GERO Tower ... Ship
 GERS Trenchant ... Ship
 GERT Tribune ... Ship
 GERV Trinidad ... Ship
 GERW Trojan ... Ship
 GERX Truant ... Ship
 GERY Truculent ... Ship
 GERZ Trusty ... Ship
 GESK Tumult ... Ship
 GESD Turbulent ... Ship
 GESF Turquoise ... Ship
 GESJ Tuscan GESJ ... Ship
 GESK Tyrant ... Ship
 GESL Tyrian GESL ... Ship
 GESM Ulster GESM ... Ship
 GESP Undine ... Ship
 GESQ Urchin ... Ship
 GESR Ursa ... Ship
 GEST Ursula ... Ship
 GESV Val'halla ... Ship
 GESW Valentine ... Ship
 GESX Valkvrie ... Ship
 GESY Valorous ... Ship
 GESZ Vampire ... Ship
 GETB Vancouver ... Ship
 GETB ... Ship
 GETC Vanessa ... Ship
 GETD Vanity ... Ship
 GETF Vanoc ... Ship
 GETJ Vanquisher ... Ship
 GETK Vansittart ... Ship
 GETL Vectis ... Ship
 GETM Vega GETM ... Ship
 GETN Velox ... Ship
 GETP Vendetta ... Ship
 GETO Venomous ... Ship
 GETR Venetia GETR ... Ship

GETS	Venturous ...	Ship	GEYS	Burslem ...	Ship
GETV	Verdun GETV ...	Ship	GEYV	Camberley ...	Ship
GETW	Verity ...	Ship		GEYV ...	Ship
GETX	Versatile ...	Ship	GEYW	Carstairs ...	Ship
GETY	Vesper ...	Ship	GEYX	Caterham ...	Ship
GETZ	Veteran ...	Ship	GEYZ	Celandine ...	Ship
GEVB	Viceroy ...	Ship	GEZB	Chrysanthemum ...	Ship
GEVC	Vidette ...	Ship	GEZC	Clematis GEZC ...	Ship
GEVD	Vimiera ...	Ship	GEZF	Collinson ...	Ship
GEVF	Violent ...	Ship	GEZJ	Cornflower ...	Ship
GEVJ	Viscount ...	Ship	GEZK	Crozier ...	Ship
GEVK	Vivacious ...	Ship	GEZL	Dorking ...	Ship
GEVL	Vivien ...	Ship	GEZM	Dundalk ...	Ship
GEVM	Volunteer GEVM ...	Ship	GEZN	Dundon ...	Ship
GEVN	Vortigern ...	Ship	GEZP	Elfin ...	Ship
GEVP	Voyager ...	Ship	GEZO	Endeavour ...	Ship
GEVO	Wakeful ...	Ship	GEZR	Espiegle ...	Ship
GEVR	Walker GEVR ...	Ship	GEZT	Faversham ...	Ship
GEVS	Walpole ...	Ship	GEZV	Fermoy ...	Ship
GEVT	Walrus ...	Ship	GEZW	Fitzroy ...	Ship
GEVW	Wanderer ...	Ship	GEZX	Flinders ...	Ship
GEVX	Warwick GEVX ...	Ship	GEZY	Flying Fox ...	Ship
GEVY	Watchman ...	Ship	GFA	Air Ministry ...	G.B.
GEVZ	Water Hen ...	Ship	GFB	Baldonne ...	G.B.
GEWB	Wessex ...	Ship	GFC	Cranwell ...	G.B.
GEWC	Westcott ...	Ship	GFG	Grain ...	G.B.
GEWD	Westminster ...	Ship	GFI	Andover ...	G.B.
GEWF	Whirlwind ...	Ship	GFK	Donibristle ...	G.B.
GEWJ	Whitley ...	Ship	GFL	Calshot ...	G.B.
GEWK	Whitshed ...	Ship	GFM	Cattewater ...	G.B.
GEWL	Wild Swan ...	Ship	GFO	Shotwick ...	G.B.
GEWM	Winchelsea ...	Ship	GFW	Lee-on-Solent ...	G.B.
GEWN	Winchester ...	Ship	GFZ	Howden ...	G.B.
GEWP	Windsor ...	Ship	GFAB	Ford GFAB ...	Ship
GEWQ	Wishart ...	Ship	GFAC	Forres ...	Ship
GEWR	Witherington ...	Ship	GFAD	Foxglove ...	Ship
GEWS	Wivern ...	Ship	GFAJ	Wren ...	Ship
GEWT	Wolf-Hound ...	Ship	GFAK	Gainsborough ...	Ship
GEWV	Wolsey ...	Ship	GFAL	Godetia ...	Ship
GEWX	Woolsten ...	Ship	GFAM	Gretna ...	Ship
GEWY	Wrestler ...	Ship	GFAN	Heather GFAN ...	Ship
GEWZ	Wryneck ...	Ship	GFAP	Hollyhock ...	Ship
GEXB	Terror GEXB ...	Ship	GFAR	Kellet ...	Ship
GEXF	Marshal Soult ...	Ship	GFAS	Kendal ...	Ship
GEXK	Ark Royal ...	Ship	GFAV	Leamington ...	Ship
GEXL	Furious ...	Ship		GFAV ...	Ship
GEXM	Pegasus ...	Ship	GFAW	Lupin ...	Ship
GEXN	Ambrose ...	Ship	GFAX	Lydd ...	Ship
GEXR	Blenhiem ...	Ship	GFAY	Magnolia ...	Ship
GEXS	Dido GEXS ...	Ship		GFAY ...	Ship
GEXT	Diligence ...	Ship	GFAZ	Mallaig ...	Ship
GEXT	Argus GEXT ...	Ship	GFBC	Mooltan ...	Ship
GEXV	Dolphin ...	Ship	GFBD	Maloja ...	Ship
GEXW	Gibraltar ...	Ship	GFBJ	Mongolia ...	Ship
GEXY	Greenwich ...	Ship		GFBJ ...	Ship
	GEXY ...	Ship	GFBK	Mirzapore ...	Ship
GEXZ	Hecla ...	Ship	GFB�	Ballena ...	Ship
GEYB	Lucia ...	Ship	GFB�	Ballarat ...	Ship
GEYC	Maidstone ...	Ship	GFBM	Balranald ...	Ship
GEYD	Pandora ...	Ship	GFBN	Baradine ...	Ship
GEYE	Sandhurst ...	Ship	GFBP	Barra Bool ...	Ship
GEYJ	Titania GEYJ ...	Ship	GFBQ	Bendigo ...	Ship
GEYK	Vulcan GEYK ...	Ship	GFBR	Lady Kerry ...	Ship
GEYL	Albury ...	Ship	GFBT	Lady Wicklow ...	Ship
GEYM	Alresford ...	Ship	GFBT	Glanbrydan ...	Ship
GEYN	Auricula ...	Ship	GFBV	Lutterworth ...	Ship
GEYP	Babington ...	Ship	GFBW	Sandown Castle ...	Ship
GEYQ	Beaufort GEYQ ...	Ship	GFBX	Douglas ...	Ship
GEYR	Bluebell ...	Ship	GFBY	Mona ...	Ship

GFBZ	Fenella ...	Ship	GFJC	Fred Cleeves ...	Ship
GFCB	Avontown ...	Ship	GFJO	Nirpura ...	Ship
GFCD	Bearwood ...	Ship	GFJK	Peruviana ...	Ship
GFCJ	Cornwood ...	Ship	GFJL	Silverway ...	Ship
GFCK	Portwood ...	Ship	GFJM	Inston ...	Ship
GFCL	City of ...	Ship	GFJN	Borulos ...	Ship
	Cambridge ...	Ship	GFJP	Dakahlieh ...	Ship
GFCM	Lady Carlow ...	Ship	GFJQ	Mansourah ...	Ship
GFCN	Breslau ...	Ship		GFJQ ...	Ship
GFCP	Coblentz ...	Ship	GFJR	Ringdove's Aid ...	Ship
GFCQ	Weimar ...	Ship	GFJS	Pittsburgh ...	Ship
GFCR	Rowan Park ...	Ship		GFJS ...	Ship
GFCS	Melrose GFCS...	Ship	GFJT	Calgary ...	Ship
GFCT	Corland ...	Ship	GFJV	Yarrow ...	Ship
GFCV	Bompata ...	Ship	GFJW	Myrtlepark ...	Ship
GFCW	Ardmore GFCW	Ship	GFJY	Sevilla GFJY...	Ship
GFCX	Kenmare GFCX	Ship	GFJZ	S. Felix ...	Ship
GFCY	Dakarian ...	Ship	GFJZ	S. Aurora ...	Ship
GFCZ	Hurunui ...	Ship	GFKB	S. Teodoro ...	Ship
GFDB	British Colonial	Ship	GFKC	S. Lamberto ...	Ship
GFDC	Orlock Head ...	Ship	GFKL	S. Ubaldo ...	Ship
GFDJ	Coronaldo ...	Ship	GFKM	S. Ugon ...	Ship
GFDK	S. Gertrudis ...	Ship	GFKN	S. Leopoldo ...	Ship
GFDL	Athenia ...	Ship	GFKP	S. Leonardo ...	Ship
GFDN	Cortona ...	Ship	GFKQ	Ting Sang ...	Ship
GFDQ	Bedecrag ...	Ship	GFKW	Kut Sang ...	Ship
GFDR	Gracia ...	Ship	GFKX	Faw Sang ...	Ship
GFDT	Hornbill ...	Ship	GFKY	Dosina ...	Ship
GFDV	Scarab... ..	Ship	GFKZ	Scalaria ...	Ship
GFDV	Min GFDV ...	Ship	GFLB	Spirila ...	Ship
GFDW	Italian Prince ...	Ship	GFLC	Solen ...	Ship
GFDW	Italiana ...	Ship	GFLD	Saxicava ...	Ship
GFDX	Matakana ...	Ship	GFLJ	Limnea ...	Ship
GFDY	British Viscount	Ship	GFLK	Radix ...	Ship
GFDZ	Modasa ...	Ship	GFLM	Paludina ...	Ship
GFEB	Malvern ...	Ship	GFLN	Petricola ...	Ship
GFEC	Marlow ...	Ship	GFLP	Planorbis ...	Ship
GFED	Merlin ...	Ship	GFLQ	Pleidon ...	Ship
GFEE	Meynell ...	Ship	GFLR	Nassa ...	Ship
GFEL	Mistley... ..	Ship	GFLS	Murex ...	Ship
GFEM	Witch ...	Ship	GFLT	Avoceta ...	Ship
GFEN	Mutine ...	Ship	GFLV	Ribera ...	Ship
GFEP	Nailsea... ..	Ship	GFLW	Ballycotton ...	Ship
GFEQ	Newark ...	Ship	GFLX	Goodwin ...	Ship
GFES	Northolt ...	Ship	GFLY	Lizard ...	Ship
	Pangbourne ...	Ship	GFLZ	Longships ...	Ship
	GFES ...	Ship	GFM	Pladda ...	Ship
GFET	Petersfield ...	Ship	GFM	Rathlin ...	Ship
GFEV	Prestatyn ...	Ship	GFM	Saltees ...	Ship
GFEX	Ross ...	Ship	GFM	Sheerness ...	Ship
GFEX	Rugby ...	Ship	GFM	Skerryvore ...	Ship
GFEX	Saltash... ..	Ship	GFM	Seminole GFML	Ship
GFEX	Saltburn ...	Ship	GFM	Athelstane ...	Ship
GFEX	Selkirk ...	Ship	GFM	Orowaiti ...	Ship
GFEX	Sherborne ...	Ship	GFM	Semper Paratus	Ship
GFEX	Shrewsbury ...	Ship	GFM	Borde ...	Ship
GFEX	Snapdragon ...	Ship	GFM	Windsor Castle	Ship
GFEX	Stafford ...	Ship	GFM	Lothar Bohlen	Ship
GFEX	Sutton ...	Ship	GFM	City of ...	Ship
GFEX	Whitehall ...	Ship	GFM	Christiania ...	Ship
GFEX	Tiverton GFIO	Ship	GFM	City of Tokio ...	Ship
GFEX	Tonbridge ...	Ship	GFM	Hazel Park ...	Ship
GFEX	Tralee ...	Ship	GFM	Heath Park ...	Ship
GFEX	Tring ...	Ship	GFM	Laurel Park ...	Ship
GFEX	Truro ...	Ship	GFM	Dakotian ...	Ship
GFEX	Valerian ...	Ship	GFM	Vandyck ...	Ship
GFEX	Verbena ...	Ship	GFM	Voltaire GFND	Ship
GFEX	Wallflower ...	Ship	GFM	Moyle ...	Ship
GFEX	Eastney ...	Ship	GFM	Clan Macnair ...	Ship

GfNL	Shelley ...	Ship	GFRK	Arniston ...	Ship
GfNM	Devonia ...	Ship	GfRL	Lochiel... ..	Ship
GfNP	Britannia GfNP	Ship	GfRM	Clydesdale	
GfNQ	Cambria GfNQ	Ship		GfRM ...	Ship
GfNR	Ravenswood ...	Ship	GFRN	Sheila ...	Ship
GfNS	Glen Usk ...	Ship	GFRP	Plover ...	Ship
GfNT	Glen Gower ...	Ship	GFRQ	Gael ...	Ship
GfNV	Dunara Castle	Ship	GFRS	City of Boston	Ship
GfNW	Maid of Delos	Ship	GFRT	Oso (El) ...	Ship
GfNX	Maid of Crete ...	Ship	GFRV	Pato (El) ...	Ship
GfNY	Nuthatch ...	Ship	GFRV	Grillo (El) ...	Ship
GfNZ	Everton ...	Ship	GFRW	Tunisiana ...	Ship
GFOB	Worcester GFOB	Ship	GFRW	Lancastrian	
GFOC	Wistaria ...	Ship		Prince ...	Ship
GFOD	Weybourne ...	Ship	GFRX	Duke of Cornwall	Ship
GFOJ	Yeovil ...	Ship	GFRY	Calanda ...	Ship
GFOK	Aphis ...	Ship	GFSB	Tirpitz GFSB	Ship
GFOI	Bee ...	Ship	GFSB	Empress of	
GfOM	Cicala ...	Ship		China ...	Ship
GfON	Cockchafer ...	Ship	GFSB	Empress of	
GfOP	Cricket GfOP	Ship		Australia ...	Ship
GfOQ	Dwarf ...	Ship	GfSC	City of Pittsburg	Ship
GfOR	Gnat ...	Ship	GfSJ	Howra ...	Ship
GfOS	Mantis ...	Ship	GfSK	Nagina ...	Ship
GfOT	Moth ...	Ship	GfSL	Durenda ...	Ship
GfOW	Tarantula ...	Ship	GfSM	Invergordon ...	Ship
GfOX	Thistle GfOX	Ship	GfSN	Inveravon ...	Ship
GfOY	Glow-Worm ...	Ship	GfSP	Inverurie ...	Ship
GfOZ	Ladybird ...	Ship	GfSQ	Port Cambell ...	Ship
GfPB	Acardo ...	Ship	GfSR	Port Auckland	Ship
GfPC	Amalthus ...	Ship	GfST	British Grenadier	Ship
GfPD	Achatina ...	Ship	GfSV	British Gunner	Ship
GfPJ	Ampullaria ...	Ship	GfSW	Ho Sang ...	Ship
GfPK	S. Gasper ...	Ship	GfSX	Casár II ...	Ship
GfPL	Willow Park	Ship	GfSY	Germania ...	Ship
GfPM	Emil George V.		GfSZ	Tenbury ...	Ship
	Staass ...	Ship	GfTB	Westbury ...	Ship
GfPN	Mona's Isle ...	Ship	GfTC	Hebrides ...	Ship
GfPO	Iris GfPO	Ship	GfTD	Carronpark ...	Ship
GfPR	Claymore GfPR	Ship	GfTJ	Montcalm GfTJ	Ship
GfPS	Manxman ...	Ship	GfTK	Montrose GfTK	Ship
GfPT	Gienoun ...	Ship	GfTL	Montclare GfTL	Ship
GfPV	Mona's Queen	Ship	GfTM	Mulbera ...	Ship
GfPW	Tynwald ...	Ship	GfTN	Dumra ...	Ship
GfPX	Cochrane ...	Ship	GfTP	Dwarka ...	Ship
GfPY	Clan Maciver ...	Ship	GfTQ	Dalgoma ...	Ship
GfPZ	Greyhound ...	Ship	GfTR	Ethiopia ...	Ship
GfQB	Draco ...	Ship	GfTS	Nalgora ...	Ship
GfQC	Gitano	Ship	GfTV	Dominion Miller	Ship
GfQD	Hardwicke		GfTW	Melisande ...	Ship
	Grange ...	Ship	GfTX	Thebea... ..	Ship
GfQJ	Pencarrow ...	Ship	GfTY	Ramsey GfTY	Ship
GfQK	Keats ...	Ship	GfTZ	Mountpark ...	Ship
GfQL	British Tommy	Ship	GfUD	Adamant ...	Ship
GfQM	City of Paris ...	Ship	GfUF	Alecto ...	Ship
GfQN	City of Stinla ...	Ship	GfUJ	Assistance ...	Ship
GfQP	Balmoral ...	Ship	GfUK	Cyclops GfUK	Ship
GfQR	Dalewood ...	Ship	GfUN	Triad ...	Ship
GfQS	Manoa GfQS ...	Ship	GfUQ	Iroquois GfUQ	Ship
GfQV	Scottish Standard	Ship	GfUR	Victoria and	
GfQW	Scottish Maiden	Ship		Albert ...	Ship
GfQX	Scottish Minstrel	Ship	GfUS	Dee ...	Ship
GfQY	Scottish		GfUT	Doon ...	Ship
	Musician ...	Ship	GfUW	Kennett ...	Ship
GfQZ	Carpio ...	Ship	GfUX	Colne ...	Ship
GfRB	Churruca ...	Ship	GfUY	Cherwell ...	Ship
GfRC	Ceuta ...	Ship	GfUZ	Ettrick... ..	Ship
GfRD	Cisneros GfRD	Ship	GfVB	Mevun ...	Ship
GfRJ	Capri GfRJ ...	Ship	GfVC	Diplomat ...	Ship

GFVD	Bellbro...	...	Ship
GFVJ	Bellview	...	Ship
GFVK	Peninnis	...	Ship
GFVM	Coolana	...	Ship
GFVN	British Chan-		
	cellor	...	Ship
GFVP	British Judge	...	Ship
GFVQ	British Trader	...	Ship
GFVR	Persiana	...	Ship
GFVR	Chickahominy	...	Ship
GFVS	Sir James Bell	...	Ship
GFVT	Cygnat	...	Ship
GFWC	Karonga	...	Ship
GFWD	Welsh City	...	Ship
GFWJ	S. Fabian	...	Ship
GFWK	S. Gerardo	...	Ship
GFWL	Fewciana	...	Ship
GFWM	Cynthiana	...	Ship
GFWM	Hoosac GFWM	...	Ship
GFWN	British Merchant	...	Ship
GFWP	Clan Macneil	...	Ship
GFWQ	Corsea	...	Ship
GFWR	Bellasco	...	Ship
GFWS	Huntsman	...	Ship
GFVV	Majestic GFVV	...	Ship
GFWX	Sophocles	...	Ship
GFWY	Glengariff	...	Ship
GFWZ	Quesnoy (Le)	...	Ship
GFXB	Rio Blanco	...	Ship
GFXJ	Rio Claro	...	Ship
GFXK	John W. Mackay	...	Ship
GFXL	City of Yoko-		
	hama	...	Ship
GFXM	Elizabeth Ann	...	
	Slater	...	Ship
GFXN	Dunmore Head	...	Ship
GFXN	Baron Vernon	...	Ship
GFXP	Riol	...	Ship
GFXQ	Empress of		
	Canada	...	Ship
GFXR	Milltown	...	Ship
GFXS	Bosnia	...	Ship
GFXT	Egyptiana	...	Ship
GFXT	Appomattox	...	Ship
GFXV	Slieve Donard...	...	Ship
GFXW	British Enter-		
	prise	...	Ship
GFXY	Braziliana	...	Ship
GFXZ	Arabiana	...	Ship
GFXZ	Alleghany	...	Ship
GFYB	Maunganui	...	Ship
GFYC	Morna	...	Ship
GFYD	Moeraki	...	Ship
GFYJ	Mokoia...	...	Ship
GFYK	Navua	...	Ship
GFYL	Taviuni	...	Ship
GFYM	Fofua	...	Ship
GFYN	Wahine	...	Ship
GFYP	Waihora	...	Ship
GFYQ	Waitomo	...	Ship
GFYS	Pegu	...	Ship
GFYT	Macabi	...	Ship
GFYV	Brynymor	...	Ship
GFYW	Umulu	...	Ship
GFYX	Egyptian Prince	...	Ship
GFYX	Cairnross	...	Ship
GFYZ	Manauai	...	Ship
GFZB	Maravi	...	Ship
GFZC	S. Elvies	...	Ship

GFZJ	Marguerite		
	GFZJ (La)	...	Ship
GFZK	Nestlea	...	Ship
GFZL	Stornest	...	Ship
GFZM	Charon GFZM	...	Ship
GFZP	Minderoo	...	Ship
GFZQ	S. Benito	...	Ship
GFZR	Castlegarth	...	Ship
GFZS	Clan		
	Macnaughton	...	Ship
GFZT	Earlshall	...	Ship
GFZV	Quest	...	Ship
GFZW	S Breock	...	Ship
GFZX	Hatasu...	...	Ship
GFZY	Chihuahua	...	Ship
GIB	S. George GIB	...	Ship
GIC	City of Delhi	...	Ship
GIE	Trewellard	...	Ship
GIF	Berbice	...	Ship
GII	Galileo GII	...	Ship
GIL	Hantonia	...	Ship
GIR	Highland Glen	...	Ship
GIT	Manora	...	Ship
GIU	Highland Laddie	...	Ship
GIY	Highland Loch	...	Ship
GIZ	Rimouski	...	Ship
GJA	Highland Pride	...	Ship
GJB	Highland Rover	...	Ship
GJE	Honorius	...	Ship
GJF	Huanchaco	...	Ship
GJG	Hyacinthus	...	Ship
GJH	Hydaspes	...	Ship
GJI	Hypatia	...	Ship
GJJ	Idaho GJJ	...	Ship
GJK	Irishman	...	Ship
GJL	Junin	...	Ship
GJN	Lama	...	Ship
GJO	Kenuta	...	Ship
GJP	Kia Ora	...	Ship
GJQ	Kumeric	...	Ship
GJV	Lackawanna	...	Ship
GJW	Rosarina (La)	...	Ship
GJX	Shakespear	...	Ship
GJY	Levant II	...	Ship
GJBC	Chartered	...	Ship
GJBD	Florentino	...	Ship
GJBF	Sunhaven	...	Ship
GJBK	Rio Azul	...	Ship
GJBL	Kiungchow	...	Ship
GJBM	Kiangsu	...	Ship
GJBN	Olma	...	Ship
GJBP	Industry	...	Ship
GJBQ	Sandgate Castle	...	Ship
GJBR	Gorgon GJBR	...	Ship
GJBS	Killerig	...	Ship
GJBT	Linnell	...	Ship
GJBV	Lassell	...	Ship
GJBW	Malaya GJBW	...	Ship
GJBX	Andania	...	Ship
GJBY	Antonia GJBY	...	Ship
GJBZ	Ausonia GJBZ	...	Ship
GJCB	Tyrrhenia	...	Ship
GJCD	Laconia	...	Ship
GJCF	Samaria	...	Ship
GJCK	York City	...	Ship
GJCL	Guerrero	...	Ship
GJCM	Oaxaca	...	Ship
GJCN	Malines	...	Ship
GJCP	Sona	...	Ship

GJCO	Dayton ...	Ship	GJMV	Maid of Psara...	Ship
GJCR	Ellaston ...	Ship	GJMW	Silverbirch ...	Ship
GJCS	Sandysike ...	Ship	GJMX	Lai Sang ...	Ship
GJCT	Windermere ...	Ship	GJMY	Fook Sang ...	Ship
GJCV	Leonid Krassin	Ship	GJMZ	Tasso ...	Ship
GJCW	Stesso ...	Ship	GJNB	King's Grey ...	Ship
GJCX	Bedefell ...	Ship	GJNC	Earl Kitchener	Ship
GJCY	Clan Macfarlane	Ship	GJNF	City of Evans- ville ...	Ship
GJCZ	Penrith Castle	Ship	GJNL	Begum ...	Ship
GJFQ	Tekoa GJFQ ...	Ship	GKNM	Galston ...	Ship
GJFR	Hauraki ...	Ship	GJNP	British Architect	Ship
GJFS	Kohinur ...	Ship	GJNQ	British Commo- dore ...	Ship
GJFV	British Corporal	Ship	GKA	Guernsey Radio	G.B.
GJFW	British Mariner	Ship	GKB	Northolt Radio	G.B.
GJFX	British Workman	Ship	GKG	Heysham Har- bour Radio ...	G.B.
GJFY	Sir Frederick Dumayne ...	Ship	GKR	Wick Radio ...	G.B.
GJFZ	Norfolk GJFZ...	Ship	GKU	Devizes Radio	G.B.
GJFZ	Huntingdon ...	Ship	GKZ	Grimsby Radio	G.B.
GJKB	Rumania ...	Ship	GKAB	Liffey ...	Ship
GJKC	British Industry	Ship	GKAC	Exe ...	Ship
GJKF	Gelves GJKF	Ship	GKAD	Boyne GKAD...	Ship
GJKM	Traveller GJKM	Ship	GKAJ	Aberdare ...	Ship
GJKN	Toco ...	Ship	GKAM	Abingdon ...	Ship
GJKN	Jackson GJKN	Ship		GKAM	
GJKP	Chuky ...	Ship	GKAN	Atherstone ...	Ship
GJKP	Logan GJKP ...	Ship	GKAP	Bagshot ...	Ship
GJKQ	Blythmoor ...	Ship	GKAQ	Blackwater ...	Ship
GJKR	Famaka ...	Ship	GKAS	Bryony ...	Ship
GJKR	Fezara ...	Ship	GKAT	Cachalot ...	Ship
GJKT	British Councillor	Ship	GKAV	Chelmsford ...	Ship
GJKV	British Com- mander ...	Ship	GKAW	Cheltenham ...	Ship
GJKW	Castlemoor ...	Ship	GKAX	Chepstow ...	Ship
GJKX	Dalhousie GJKX	Ship	GKAY	Crocus ...	Ship
GJKX	Hearty ...	Ship	GKEB	Chrysanthemum	Ship
GJKY	Ohio GJKY ...	Ship	GKEC	Cyclamen ...	Ship
GJKZ	Dalemoor ...	Ship	GKED	Daffodil ...	Ship
GJLB	British General	Ship	GKEL	Delphinium ...	Ship
GJLC	Phyllis Seed ...	Ship	GKEM	Derby ...	Ship
GJLD	Maid of Milos	Ship	GKEN	Derwent ...	Ship
GJLF	S. Patrick ...	Ship	GKER	Eagle GKER ...	Ship
GJLK	Elizabeth Stoner	Ship	GKES	Eden ...	Ship
GJLK	Jalatarang ...	Ship	GKEV	Elgin ...	Ship
GJLM	British Advocate	Ship	GKEW	Enchantress ...	Ship
GJLN	British Engineer	Ship	GKEZ	Erne ...	Ship
GJLP	City of Nagpur	Ship	GKIT	Fareham ...	Ship
GJLQ	British Sergeant	Ship	GKID	Foyle GKID ...	Ship
GJLR	British Officer...	Ship	GKIK	Harebell ...	Ship
GJLS	Duchess ...	Ship	GKIL	Harpenden ...	Ship
GJLT	Bengore Head	Ship	GKIM	Harrow ...	Ship
GJLV	Scholar ...	Ship	GKIN	Heliotrope	
GJLX	Rallus ...	Ship		GKIN	
GJLY	Bayeskimo ...	Ship	GKIQ	Huntley ...	Ship
GJLZ	Alnmoor ...	Ship	GKIS	Itchen ...	Ship
GJMB	Port Hunter ...	Ship	GKIV	Lily GKIV ...	Ship
GJMC	Blairbeg ...	Ship	GKIW	Lord Clive ...	Ship
GJMD	Blairholm ...	Ship	GKIY	Marazion ...	Ship
GJMF	Cid. GJMF ...	Ship	GKIZ	Moorhen ...	Ship
GJMK	Dunure ...	Ship	GKOB	Moy ...	Ship
GJML	Berengar ...	Ship	GKOF	Nith ...	Ship
GJMN	Manchester Regiment ...	Ship	GKOJ	Ouse ...	Ship
GJMP	British Trade ...	Ship	GKOI	Racer ...	Ship
GJMQ	Mexican Lady	Ship	GKOM	Robin GKOM	Ship
GJMR	Scottish Strath	Ship	GKON	Rother ...	Ship
GJMS	British Com- merce ...	Ship	GKOR	Stoke ...	Ship
GJMT	Eastmoor ...	Ship	GKOS	Stour ...	Ship

GKOT	Submarine H21	Ship	GLIR	Submarine L2	Ship
GKOV	Submarine H22	Ship	GLIS	Submarine L3	Ship
GKOW	Submarine H23	Ship	GLIT	Submarine L4	Ship
GKOX	Submarine H24	Ship	GLIV	Submarine L5	Ship
GKOY	Submarine H25	Ship	GLIW	Submarine L6	Ship
GKOZ	Submarine H26	Ship	GLIX	Submarine L7	Ship
GKUB	Submarine H27	Ship	GLIY	Submarine L8	Ship
GKUC	Submarine H28	Ship	GLIZ	Submarine L9	Ship
GKUD	Submarine H29	Ship	GLOB	Submarine L11	Ship
GKUF	Submarine H30	Ship	GLOC	Submarine L12	Ship
GKUJ	Submarine H31	Ship	GLOD	Submarine L25	Ship
GKUL	Submarine H32	Ship	GLOF	Submarine L33	Ship
GKUM	Submarine H33	Ship	GLOJ	Submarine L52	Ship
GKUN	Submarine H34	Ship	GLOK	Submarine L56	Ship
GKUQ	Submarine H43	Ship	GLOM	Submarine L71	Ship
GKUR	Submarine H44	Ship	GLOH	Submarine M1	Ship
GKUS	Submarine H47	Ship	GLOP	Submarine M2	Ship
GKUT	Submarine H48	Ship	GLOQ	Submarine M3	Ship
GKUV	Submarine H49	Ship	GLOK	Submarine R1	Ship
GKUW	Submarine H50	Ship	GLOS	Submarine R2	Ship
GKUX	Submarine H51	Ship	GLOT	Submarine R3	Ship
GKUY	Submarine H52	Ship	GLOV	Submarine R4	Ship
GKUZ	Submarine K2	Ship	GLOW	Submarine R7	Ship
GLA	North Weald,		GLOX	Submarine R8	Ship
	North Station		GLOZ	Alexandra	
	A. Ongar		GLOZ	...	Ship
	Radio ...	G.B.	GMH	Malin Head	
GLB	North Weald,			Radio ...	G.B.
	North Station B.		GMR	Gambela	Abyssinia
	Ongar Radio	G.B.	GNG	City of Edin-	
GLO	North Weald,			burgh ...	Ship
	North Station		GNE	Waimana	Ship
	C Ongar Radio	G.B.	GNF	North Forland	
	Seaforth Radio	G.B.		Radio ...	G.B.
GLV	Submarine K6	Ship	GNI	Niton Radio	G.B.
GLAC	Submarine K8	Ship	GNJ	Fasnet	G.B.
GLAD	Submarine K9	Ship	GNK	Waipara	Ship
GLAF	Submarine K12	Ship	GNL	Onda ...	Ship
GLAM	Submarine K14	Ship	GNM	Highland Piper	Ship
GLAN	Submarine L14	Ship	GNR	Geneina	Sudan
GLAP	Submarine L15	Ship	GNS	Karoo	Ship
GLAQ	Submarine L16	Ship	GNV	Newhaven Radio	G.B.
GLAR	Submarine L17	Ship	GNW	Orissa ...	Ship
GLAS	Submarine L18	Ship	GNV	Orna ...	Ship
GLAT	Submarine L19	Ship	GNZ	Ozarda	Ship
GLAV	Submarine L20	Ship	GOA	Queda ...	Ship
GLAW	Submarine L21	Ship	GOB	Querimba	Ship
GLAX	Submarine L24	Ship	GOC	Quiloo ...	Ship
GLAY	Submarine R9	Ship	GOD	Sangola	Ship
GLAZ	Submarine R12	Ship	GOE	Santhia	Ship
GLEB	Submarine R10	Ship	GOF	Sealda ...	Ship
GLEB	Submarine R11	Ship	GOG	Koolonga	Ship
GLEC	Superb ...	Ship	GOH	Sofala ...	Ship
GLEF	S. Cyrus ...	Ship	GOJ	Torilla ...	Ship
GLEK	S. Genny ...	Ship	GOL	Ula Gol	Ship
GLEM	S. Fagan ...	Ship	GOM	Trevarrack	Ship
GLEN	S. Issey ...	Ship	GON	Umta ...	Ship
GLEP	S. Martin GLEQ	Ship	GOO	Upada ...	Ship
GLEQ	S. Maurice ...	Ship	GOP	Urlana	Ship
GLER	Torbay ...	Ship	GOQ	Culna ...	Ship
GLEV	Widnes ...	Ship	GOU	Brockleaf	Ship
GLIC	Wilverine GLID	Ship	GOX	Trecarrel	Ship
GLID	Woodcock GLIF	Ship	GOY	Trematon	Ship
GLIF	Woodlark ...	Ship	GOZ	Wulsty Castle...	Ship
GLIJ	Woolwick ...	Ship	GPE	Chakrata	Ship
GLIK	Submarine K15	Ship	GPF	Amsterdam	Ship
GLIM	Submarine K16	Ship	GPK	Port Patrick	
GLIN	Submarine K22	Ship		Radio	G.B.
GLIP	Submarine L1	Ship	GPL	Roulers	Ship
GLIQ					

GPN	Antrim...	Ship	GUE	Oruba GUE	Ship
GPP	Duchess of Devonshire	Ship	GUI	Empress	Ship
GPQ	Parkeston Quay Radio	Ship	GUJ	City of Bombay	Ship
GPR	Londonderry	Ship	GUL	Invicta GUL	Ship
GPS	Manxman	Ship	GUO	Riviera	Ship
GPT	Chanda	Ship	GUP	Victoria GUP	Ship
GPU	Chupra...	Ship	GUR	Folkestone H'b'r Radio	G.B.
GPV	Nessian	Ship	GUS	Greenore	Ship
GPW	Lakonia	Ship	GUT	Rathmore	Ship
GPZ	Plucana	Ship	GUU	Galtee More	Ship
GQA	Ayrshire	Ship	GUX	Crossway	Ship
QOB	Perthshire	Ship	GUY	Engadine	Ship
QOC	Durham	Ship	GUZ	Ajax	Ship
QOE	Sequoia	Ship	GVA	Gross Sand L'ship	G.B.
QOO	Transmitter	Ship	GVB	East Goodwin Lightship	G.B.
QOP	Munardan	Ship	GVC	Gull Lightship	G.B.
QOS	Lady Brassey	Ship	GVD	South Goodwin Lightship	G.B.
QOW	Australind	Ship	GVE	Sunk Lightship	G.B.
GRB	Baron Polwarth	Ship	GVF	Tongue L'tship	G.B.
GRG	Arvonja	Ship	GVH	Buteshire	Ship
GRI	Mississippi GRI	Ship	GVI	Malakuta	Ship
GRJ	Kurdistan	Ship	GVJ	Mahanada	Ship
GRK	Trivia	Ship	GVK	Ericus	Ship
GRL	Fishguard Radio	G.B.	GVL	Clan Macquarrie	Ship
GRM	Volumnia	Ship	GVM	Banfishire	Ship
GRN	Rathlin Island Radio	G.B.	GVN	Maidan	Ship
GRO	Egba	Ship	GVO	Nolisement	Ship
GRP	Burmese Prince	Ship	GVQ	Eirene Ariadne	Ship
GRR	Menevia	Ship	GVR	Cento	Ship
GRS	Portuguese Prince	Ship	GVS	Clan Macgillivray	Ship
GRT	Sittang...	Ship	GVT	Burma	Ship
GRU	Katharine Park	Ship	GVV	Clanogilvy	Ship
GRV	Suffolk GRV	Ship	GVX	Ethelfreda	Ship
GRX	Trentino	Ship	GVY	Turkistan	Ship
GRZ	Ixion	Ship	GVZ	Cauca	Ship
GSA	Uncus GSA	Ship	GVBC	Changsha	Ship
GSB	Port Macquarie	Ship	GVBD	Victoria	Ship
GSC	Protesilaus	Ship	GVBF	Taiyuan	Ship
GSF	Shropshire	Ship	GVBJ	Tahchee	Ship
GSG	Tamaha	Ship	GVBK	Tascalusa	Ship
GSJ	Talhybuis	Ship	GVBL	Loreston	Ship
GSL	Teucer	Ship	GVBM	Seistan	Ship
GSM	Ballycastle Radio	G.B.	GVLB	Gibel Zerjon	Ship
GSO	Winamac	Ship	GVLC	Accra	Ship
GSS	Titan GSO	Ship	GVLG	Gibel Yedid	Ship
GSS	Shabonee	Ship	GVLH	Gibel Zalag	Ship
GSW	Stonehaven Rad.	G.B.	GVLJ	Hong Hwa	Ship
GTB	Massasoit	Ship	GVLK	Glenfalloch	Ship
GTC	Antilochus	Ship	GVLN	Kanabec	Ship
GTD	Belleroph...	Ship	GWA	Bhamo	Ship
GTF	Cyclops GTF	Ship	GWC	Martaban	Ship
GTG	Santanta	Ship	GWD	Henzada	Ship
GTI	Otarama	Ship	GWG	Chindwin	Ship
GTJ	Argyllshire	Ship	GWJ	Ganges	Ship
GTL	Oanfa	Ship	GWK	Chenab	Ship
GTN	Wabasha	Ship	GWK	Glenbridge	Ship
GTP	Faraday	Ship	GWL	Sutlej	Ship
GTR	Masconomo	Ship	GWO	Arracan	Ship
GTS	Monarch GTS	Ship	GWP	Mandalay	Ship
GTU	Onaka	Ship	GWV	Michael	Ship
GTX	Willston	Ship	GWV	Alban	Ship
GTY	Aspinet	Ship	GWZ	Meissonier GWZ	Ship
GTZ	Port Lincoln	Ship	GXA	Tregantle	Ship
GUA	Arakaka	Ship	GXC	Apollo	Ship
GUB	Anglo-Saxon	Ship	GXD	Scientist	Ship
			GXE	Essex GXE	Ship

GXF	Songster ...	Ship	HEP	Venus HEP ...	Ship
GXH	Coya ...	Ship	HEQ	Maraglo ...	Ship
GXI	Capac ...	Ship	HBS	Beverwijk 20 ...	Ship
GXO	Crookhaven ...	G.B.	HET	Marmevo ...	Ship
GXQ	Burnhope ...	Ship	HEU	Stad Delft ...	Ship
GXS	Ambassador ...	Ship	HEV	Vredenburg ...	Ship
GXT	Leafield ...	Ship	HEW	Stolwijk ...	Ship
GXW	Clumberhall ...	Ship	HEX	Delfshaven ...	Ship
GXX	Arncliffe ...	Ship	HEY	Schiehaven ...	Ship
GYA	City of Norwich	Ship	HEZ	Domburg ...	Ship
GYH	Empress of		HFB	Belgrade ...	Serbs,
	France ...	Ship			Croates
GYJ	S. Andrew GYJ	Ship			Slovenes
GYL	S. David ...	Ship	HFC	Sarajevo ...	Serbs,
GYM	S. Patrick GYM	Ship			Croates
GYN	S. Fraterno ...	Ship			Slovenes
GYO	Manavi ...	Ship	HFS	Skoplje ...	Serbs,
GYQ	Kazembe ...	Ship			Croates
GYS	Vitruvia ...	Ship			Slovenes
GYX	Ben Nevis ...	Ship	HGA	Bangkok ...	Siam
GYZ	Koranna ...	Ship	HGB	Singora ...	Siam
GZC	Djerissa ...	Ship	HGC	Bali HGC ...	Ship
GZG	Warszawa GZG	Ship	HGC	Bali ...	Ship
GZH	Tacoma GZH	Ship	HGD	Sua Tayanchol	Ship
GZI	Stockwell ...	Ship	HGE	Sua Kamren-	
GZM	Clan Mackellar	Ship		sindhu ...	Ship
GZX	Minnedosa ...	Ship	HGF	Sugrib ...	Ship
GZY	Idomeneus ...	Ship	HGG	Muratha ...	Ship
HB	Csepel ...	Hungary	HGH	Makut Raja	
HB	Buda-Pesth ...	Hungary		kumara ...	Ship
HBB	Berne ...	Switzerland	HGL	Mahachakkri ...	Ship
HCE	Esmeraldas ...	Ecuador	HGN	Sua	
HCG	Quito ...	Ecuador		Kamrenindhu	Ship
HCG	Guayaquil ...	Ecuador	HGR	Red Light Ship I	Siam
HDA	Mizar ...	Ship	HGS	Suriya Monthon	Ship
HDB	Aldebarran ...	Ship	HGT	Vidhet Kichkara	Ship
HDC	Alioth ...	Ship	HGX	Phra Ruang ...	Ship
HDD	Alderamin ...	Ship	HIA	Santo Domingo	Dominican
HDE	Algorab ...	Ship			Repub.
HDF	Alhena ...	Ship	HIB	Romana (La)	Dominican
HDG	Lingedijk ...	Ship			Repub.
HDH	Zaandijk HDH	Ship	HJB	Puerto Columbia	Colombia
HDK	Noord ...	Ship	HLA	Cabo Ortegall ...	Ship
HDL	Rijn ...	Ship	HLB	Basconia ...	Ship
HDN	Bovenkerk ...	Ship	HLC	Cirilo Amoros...	Ship
HDP	Amersfoort ...	Ship	HLD	Gallo (El) ...	Ship
HDO	Lexhaven ...	Ship	HLE	Iturri-Ederra ...	Ship
HDR	Vechtdijk HDR	Ship	HLF	Rogér de Flor	Ship
HDS	Yseldijk ...	Ship	HLG	Iturra-Gorri ...	Ship
HDT	Bennekom ...	Ship	HLH	Augustina Forner	Ship
HDU	Dinteldijk ...	Ship	HLI	Ibaizabal ...	Ship
HDV	Drechtijk ...	Ship	HLJ	Juan Maragall	Ship
HDX	Volendam ...	Ship	HLL	Cabo Villano ...	Ship
HDY	Veendam ...	Ship	HLM	M. Arnos ...	Ship
HDZ	Schelde HDZ ...	Ship	HLN	Santofirme ...	Ship
HEB	Groningen ...	Ship	HLO	Poeta Querol ...	Ship
HEC	Jacob Van		HLO	Peris Valero ...	Ship
	Heemskerck HEC	Ship	HLP	Paulina ...	Ship
HED	Willem Barentsz	Ship	HLQ	Begonia No. 2	Ship
HEE	Straat Soenda	Ship	HLR	Rita HLR ...	Ship
HEF	Isalania ...	Ship	HLS	Elena Fierros ...	Ship
HEG	Aalsum ...	Ship	HLT	Marques Del	
HEH	Peursum ...	Ship		Turia ...	Ship
HEI	Loppersum ...	Ship	HLU	Cabo Espartel...	Ship
HEJ	Jagersfontein ...	Ship	HLW	Marques de	
HEK	Randfontein ...	Ship		Chavarri ...	Ship
HEL	Springfontein ...	Ship	HLX	Begonia No. 3	Ship
HEN	Klipfontein ...	Ship	HLY	Axpe-Mendi ...	Ship
HEO	Orion ...	Ship	HLZ	Ampurdan ...	Ship

HMA	Ricardito ...	Ship	HPS	Cabedello HPS	Ship
HMB	Mirentxu ...	Ship	HPU	Caxambu HPU	Ship
HMB	Lubeck ...	Germany	HPW	Otavi ...	Ship
HMC	Bilbaino ...	Ship	HPX	Guaratuba HPX	Ship
HMD	Aldecoa ...	Ship	HPZ	Ingo ...	Ship
HME	Velarde ...	Ship	HQB	Joazeiro HQB	Ship
HMf	Aizkori-Mendi...	Ship	HQC	Annik ...	Ship
HMG	Capitan Segarra	Ship	HQE	Mandu HQE ...	Ship
HMH	Andraka-Mendi	Ship	HQE	Alaska HQE ...	Ship
HMI	Arnabel Mendi	Ship	HQH	Sobral HQH ...	Ship
HMJ	Arantzazu ...	Ship	HQO	Shimpo Maru ...	Ship
HMK	Astondo-Mendi	Ship	HQW	Victoire HQW	Ship
HML	Genoveva Fierros	Ship	HRE	Commandant	
HMM	Fernando L de			Challes ...	Ship
	Ibbarra ...	Ship	HRE	Caracas ...	Venezuela
HMN	Biscargi-Mendi	Ship	HRF	Maracay ...	Venezuela
HMO	Eretza Mendi ...	Ship	HRG	S. Christobal ...	Venezuela
HMP	Gorbea Mendi	Ship	HRH	(La) Guaira ...	Venezuela
HMQ	Igotz-Mendi ...	Ship	HRI	Dannemarie ...	Ship
HMR	Iluntzar-Mendi	Ship	HRI	Maracaybo ...	Venezuela
HMS	Jata Mendi ...	Ship	HRK	Puerto Cabello	Venezuela
HMT	Ordunte Mendi	Ship	HRL	Egalite ...	Ship
HMU	Eusebia Del Valle	Ship	HRO	General Serret	Ship
HMU	Armuro ...	Ship	HRU	Lieutenant	
HMV	Umbe-Mendi ...	Ship		Delorme ...	Ship
HMW	Upo-Mendi ...	Ship	HRV	Lieutenant	
HMx	Urkiola-Mendi	Ship		Pegoud ...	Ship
HMY	Urko-Mendi	Ship	HRW	Depute Paul	
HMZ	Iturri-Paxto ...	Ship		Proust ...	Ship
HNA	Rita HNA ...	Ship	HSB	Reims HSB ...	Ship
HNB	Achuri ...	Ship	HSB	Toul HSH ...	Ship
HNC	Gure ...	Ship	HSI	Vimy HSI ...	Ship
HND	Sendeja ...	Ship	HSQ	Erie ...	Ship
HNE	Begonia No. 5	Ship	HST	La Salle ...	Ship
HNF	Villamanrique...	Ship	HSV	Mont Magny ...	Ship
HNG	Villasindino ...	Ship	HSW	Schelswig ...	Ship
HNH	Tirso HNH ...	Ship	HSW	General Duchesne	Ship
HNI	Azpeitia ...	Ship	HSX	Montreal HSX	Ship
HNJ	Donastia ...	Ship	HSY	Nouvelle Ecosse	Ship
HNK	Wenceslao ...	Ship	HSZ	Ottawa HSZ ...	Ship
HNL	Trini ..	Ship	HTE	Quebec HTE ...	Ship
HNM	Penalba ...	Ship	HTG	Vancouver ...	Ship
HNN	Cabo Socratif ...	Ship	HTI	Wilfred Laurier	Ship
HNO	Aviles ...	Ship	HUR	C.32, Grostenquin	Ship
HNP	Tintore ...	Ship	HVM	Immacolata ...	Ship
HNQ	Capita Revuelta	Ship	HVO	Tôlier ...	Ship
HNR	José Taya ...	Ship	HVQ	Manitoba HVQ	Ship
HNS	Anorga... ..	Ship	HVS	Tisserand ...	Ship
HNT	Pax ...	Ship	HVT	Sallavery ...	Ship
HNV	Port Vila ...	New	HVV	Pecheur ...	Ship
		Hebrides	HVX	Depute Josselin	
HOI	Soutier... ..	Ship		de Rohan ...	Ship
HOJ	Verrier ...	Ship	HVY	Depute Georges	
HOK	Peintre... ..	Ship		Chaione ...	Ship
HOL	Charpentier ...	Ship	HVZ	Pisco HVZ ...	Ship
HOX	Alprecht ...	Ship	HWA	Obstine ...	Ship
HPA	Amiral		HWB	Entete ...	Ship
	Tchikatchoff	Ship	HWD	Archarne ...	Ship
HPB	California HPB	Ship	HXA	Depute Maurice	
HPD	Dumont			Bernard ...	Ship
	D'Urville HPD	Ship	HXB	Député Raoul	
HPD	Andre Chener	Ship		Briquet ...	Ship
HPH	Le Myre De		HXE	Capitaine	
	Villers ...	Ship		Maurice Eugene	Ship
HPL	Alegrette ...	Ship	HXF	Port-de-Boulogne	Ship
HPN	Atalala ...	Ship	HXG	Ripault HXG	
HPO	Ayuruoca HPO	Ship		(Le) ...	Ship
HPP	Bages ...	Ship	HXJ	Depute Pierre	
HPQ	Barbacena HPQ	Ship		Goujon ...	Ship

HZA	Cayenne ...	Fr. Guiana	ICA	Aspio Radio ...	Italy
IA	Basse Lande ...	France	ICB	Genova Radio	Italy
IAA	Ada O. ...	Ship	ICD	Rome	
IAB	Vienna ...	Ship		Centocelle ...	Italy
IAC	Ansaldo VI ...	Ship	ICE	Brindisi Radio	Italy
IAD	Cortelazzo ...	Ship	ICF	Messina Radio	Italy
IAE	Pilsna ...	Ship	ICG	Pantelleria	Italy
IAF	Brenta ...	Ship	ICH	Maddalena	
IAH	Ansaldo S.			Radio ...	Italy
	Giorgio II ...	Ship	ICJ	Bengasi Radio	Cyrenaica
IAI	Ansaldo S.		ICK	Tripoli Radio ...	Tripolitana
	Giorgio III ...	Ship	ICL	Lampedusa ...	Italy
IAJ	Fiume ...	Ship	ICN	Napoli Radio ...	Italy
IAK	Citta di Cagliari	Ship	ICO	Derna Radio ...	Cyrenaica
IAL	Rosalino Orlando	Ship	ICP	Pelermo Radio	Italy
IAO	S. Andrea	Ship	ICQ	S. Cataldo di	
IAP	Angiolo Boni ...	Ship		Bari ...	Italy
IAR	Attualita ...	Ship	ICR	Capo Sperone	
IAS	Vittoria ...	Ship		Radio ...	Italy
IAU	Adige ...	Ship	ICS	Spezia ...	Italy
IAV	Epiro ...	Ship	ICT	Taranto ...	Italy
IAW	Bengasi ...	Ship	ICU	Tobruch Radio	Cyrenaica
IAX	Derna ...	Ship	ICV	Vittoria Radio	Italy
IAY	Molietta ...	Ship	ICW	Rodi ...	Dodecanese
IAZ	Africa ...	Ship	ICX	Massaua Radio	Eritrea
IAAA	Torpediniera		ICX	Abo-el-Kader	
	Italiana ...	Ship		Peninsular ...	Eritrea
IAAB	Sommergibile		ICY	Assab Radio ...	Eritrea
	Italiano ...	Ship	ICZ	Venezia Radio	Italy
IAAC	Vedetta Italiana	Ship	ICCC	Monte Pasubio	Ship
IAAD	Rimorchiatore		ICCD	Tesso ...	Ship
	Italiano ...	Ship	ICCE	Ansaldo VII ...	Ship
IAAE	Airone ...	Ship	ICCG	Cicerone ...	Ship
IAAF	Albatros ...	Ship	ICCL	Mongibello ...	Ship
IAAG	Alcione ...	Ship	ICCM	Elettra ...	Ship
IAAH	Ardea ...	Ship	ICCN	Melpomene ...	Ship
IAAI	Arpia ...	Ship	ICCO	Carinthia ...	Ship
IAAJ	Astore ...	Ship	ICCS	Ignazio ...	Ship
IAAK	Calipso ...	Ship	ICCT	Attivita ...	Ship
IAAL	Caliope ...	Ship	IDA	Stampalia ...	Dodecanese
IAAM	Canopo ...	Ship	IDB	Saseno ...	Italy
IAAN	Cassiopea ...	Ship	IDD	Lipari ...	Italy
IAAO	Centauro ...	Ship	IDE	Stromboli ...	Italy
IAAP	Cigno ...	Ship	IDH	Cotrone Radio	Italy
IAAQ	Clio ...	Ship	IDK	Livorno ...	Italy
IAAS	Orfeo ...	Ship	IDL	Civitavecchia	
IAAT	Orione ...	Ship		Radio ...	Italy
IAAU	Pallade ...	Ship	IDN	Cirene Radio ...	Cyrenaica
IAAV	Pantera ...	Ship	IDO	San Paolo ...	Italy
IAAW	Pegaso ...	Ship	IDR	Tempio ...	Italy
IAAX	Procione ...	Ship	IDS	Ustica ...	Italy
IAAY	Rismondo ...	Ship	IEA	Napoli ...	Ship
IAAZ	Sagitta Rio ...	Ship	IEB	Monte Grappa	Ship
IBBA	Sauro ...	Ship	IEC	Palermo ...	Ship
IBBB	Sirio ...	Ship	IED	Brasile ...	Ship
IBBC	Tigre ...	Ship	IEE	Europa ...	Ship
IBBD	Abizzo ...	Ship	IEF	Sile ...	Ship
IBBE	Stige ...	Ship	IEG	Rovereto ...	Ship
IBBF	Generale Cantore	Ship	IEH	Sayoiia ...	Ship
IBBG	Generale Casino	Ship	IEK	S. Guiseppe ...	Ship
IBBH	Generale		IEL	Piave ...	Ship
	Chinotto ...	Ship	IEN	Atlanta ...	Ship
IBBI	Generale		IEO	Adriatico ...	Ship
	Montanari ...	Ship	IEP	Milazzo ...	Ship
IBBJ	Generale Papa	Ship	IEQ	Volturno ...	Ship
IBBK	Generale		IER	Fratella Bianchi	Ship
	Prestinari ...	Ship	IES	Citta di	
IBBL	Garanoglia ...	Ship		Siracusa ...	Ship
IBBM	Monte Cristo ...	Ship	IET	Citta Di Catania	Ship

IEU	Solunto ...	Ship	IHL	Sicilia ...	Ship
IEV	Posillipo ...	Ship	IHM	Sardegna ...	Ship
IEW	Masaniello ...	Ship	IHN	Vittorio Emanuele	Ship
IEX	Lepanto ...	Ship	IHP	Roma ...	Ship
IEY	Dinnamare ...	Ship	IHQ	Regina Elena ...	Ship
IEZ	Sicania ...	Ship	IHR	Pisa ...	Ship
IFA	A. Poerio ...	Ship	IHS	Ancona ...	Ship
IFB	Pepe ...	Ship	IHT	S. Marco ...	Ship
IFC	C. Rossarol ...	Ship	IHU	S. Giorgio ...	Ship
IFD	Mirabello ...	Ship	IHV	Venezia ...	Ship
IFE	Leonardo da Vinci ...	Ship	IHW	Bari ...	Ship
IFF	Augusto Riboty	Ship	IHX	Ercole ...	Ship
IFG	Teseo ...	Ship	IHY	Varese ...	Ship
IFH	Anteo ...	Ship	IHZ	Francesco Furrucio	Ship
IFJ	Cocito ...	Ship	IIA	Ardito ...	Ship
IFK	Flegetonte ...	Ship	IIB	Ardente ...	Ship
IFL	Dalmazia ...	Ship	IIC	Audace ...	Ship
IFM	Messina ...	Ship	IID	Animoso ...	Ship
IFO	Tevere ...	Ship	IIE	Alpino ...	Ship
IFQ	Cunfida ...	Ship	IIF	Giannutri ...	Ship
IFR	Reggio Calabria	Ship	IIG	Artigliere ...	Ship
IFS	Orsini ...	Ship	IIH	Bersagliere ...	Ship
IFU	S. Guisto ...	Ship	III	Leone ...	Ship
IFV	Villa San Giovanni ...	Ship	IIJ	Carabinieri	Ship
IFW	Balena ...	Ship	IIK	Corazziere ...	Ship
IFX	G.34 ...	Ship	IIM	Turbine ...	Ship
IFY	Titano ...	Ship	IIN	Euro ...	Ship
IFZ	Tremiti ...	Ship	IIO	Fuciliere ...	Ship
IGA	Bronte ...	Ship	IIQ	Premuda ...	Ship
IGB	Ausonia ...	Ship	IIR	Granattere ...	Ship
IGC	Trinacria ...	Ship	IIS	Indomito ...	Ship
IGD	Alula ...	Ship	IIT	Insidioso ...	Ship
IGE	Maggiore Tosselli	Ship	IIU	Ardimentoso ...	Ship
IGF	Archimede ...	Ship	IIV	Impavido ...	Ship
IGG	Amerigo ...	Ship	IIW	Aquilone ...	Ship
IGH	Garigliano ...	Ship	IIX	Irrequieto ...	Ship
IGI	Bengasi ...	Ship	Iiy	Confienza ...	Ship
IGJ	Citta di Milano	Ship	IIZ	Lanciere ...	Ship
IGK	Cirenaici ...	Ship	IJA	Nembo ...	Ship
IGL	Vulcano ...	Ship	IJB	Castelfidardo ...	Ship
IGM	R.D.34 ...	Ship	IJC	Pontiere ...	Ship
IGN	Giulana ...	Ship	IJD	Brennero ...	Ship
IGO	Eridano ...	Ship	IJE	Zeffiro ...	Ship
IGP	Misurata ...	Ship	IJF	Ascaro ...	Ship
IGQ	Ciclope ...	Ship	IJG	Fratelli Cairoli	Ship
IGR	Amiraglio ...	Ship	IJH	A Mosto ...	Ship
IGS	Capitano Verri	Ship	IJI	Volta ...	Ship
IGT	Climene ...	Ship	IJL	I. Nievo ...	Ship
IGU	Zenson ...	Ship	IJO	Guiseppè Missori	Ship
IGV	Sardegna ...	Ship	IJP	Aquila ...	Ship
IGW	S. Giorgio II ...	Ship	IJR	Sirtori ...	Ship
IGX	Eritrea ...	Ship	IJS	S. Martino ...	Ship
IGY	Cortelazzo ...	Ship	IJT	Solferino ...	Ship
IGZ	Sebastiano ...	Ship	IJX	Falco ...	Ship
IGZ	Caboto ...	Ship	IJY	Enrico Cosenz	Ship
IHA	Andrea Dorea	Ship	IJA	Galileo Ferraris	Ship
IHB	Duilo ...	Ship	IJB	Galileo	Ship
IHC	Dante Alighieri	Ship	IKB	Medici ...	Ship
IHD	Conte di Cavour	Ship	IKC	Prometeo ...	Ship
IHE	Giulio Cesare ...	Ship	IKD	Quarto ...	Ship
IHF	Taranto ...	Ship	IKE	Marsala ...	Ship
IHG	Italia ...	Ship	IKF	Nino Bixio ...	Ship
IHH	Brindisi ...	Ship	IKH	Libia ...	Ship
IHI	Agordat ...	Ship	IKI	Calatafimi ...	Ship
IHJ	Generale Arimondi ...	Ship	IKJ	Pola ...	Ship
IHK	Palestro ...	Ship	IKK	Puglia ...	Ship
			IKM	Campania ...	Ship

IKN	Calabr'a ...	Ship	INW	Entella ..	...	Ship
IKO	Fasana ...	Ship	INX	Piemonte ...	...	Ship
IKP	Lince ..	Ship	INY	Po ...	...	Ship
IKQ	Monfalcone ...	Ship	INZ	Ischia ..	...	Ship
IKS	A. Bassini ...	Ship	IOA	Rovigno ...	...	Ship
IKT	Grado ...	Ship	IOB	Presidente		
IKU	Muggia...	Ship		Wilson ...	...	Ship
IKY	Tripoli ...	Ship	IOC	Elba ...	...	Ship
IKW	Atlante ...	Ship	IOD	Roberto Ginori		Ship
IKY	Zara ...	Ship	IOG	Principessa		
IKZ	Monzanbano ...	Ship		Jolanda ...	...	Ship
ILA	Bolsena ...	Ship	IOH	Affinita ...	...	Ship
ILB	Bayonne ...	Ship	IOI	Amistra ...	...	Ship
ILC	Ancona ...	Ship	IOJ	Giuseppina		
ILF	Alberto			Ilardi...	...	Ship
	Cavalletto	Ship	IOK	Bolzaneto ...	...	Ship
ILH	Dalmazia ...	Ship	IOM	Albania ...	...	Ship
ILI	S. Pietro ...	Ship	IOO	Bornida ...	...	Ship
ILJ	Citta di Genova	Ship	IOP	Bulgaria ...	...	Ship
ILK	Carlo Pisacane	Ship	IOQ	Constantinopoli		Ship
ILL	Lampo ...	Ship	IOR	Carignano ...	...	Ship
ILP	Pietro Gori ...	Ship	IOT	Pegli ...	...	Ship
ILQ	Wardha ...	Ship	IOW	Ada ...	...	Ship
ILS	Splendor ...	Ship	IOX	Alessandro ...	...	Ship
ILT	Ansaldo V ...	Ship	IOY	Iride ...	...	Ship
ILU	Luigi Rizzo ...	Ship	IPB	Sumatra ...	...	Ship
ILY	Ansaldo IV ...	Ship	IPC	Nina ...	...	Ship
ILZ	Mazzini ...	Ship	IPD	Graz ...	...	Ship
IMB	Laguna ...	Ship	IPE	Ansaldo Savoia		Ship
IMC	Cariddi...	Ship	IPF	Fede ...	...	Ship
IMD	Amalfi ...	Ship	IPG	Adda ...	...	Ship
IME	S. Rossore ...	Ship	IPI	Lucania ...	...	Ship
IMF	Cogne ...	Ship	IPJ	Oceano...	...	Ship
IMG	Giove ...	Ship	IPK	Netale ...	...	Ship
IMH	Isotta ...	Ship	IPL	Labor ...	...	Ship
IMI	Silvio ...	Ship	IPM	Domingo ...	...	Ship
IMJ	Catania ...	Ship	IPQ	Fagernes ...	...	Ship
IMK	Arnaldo da		IPR	Sofia ...	...	Ship
	Brescia ...	Ship	IPS	Marsala ...	...	Ship
IML	Gonzaga ...	Ship	IPT	Canaro ...	...	Ship
IMM	Montenegro ...	Ship	IPU	Adria ...	...	Ship
IMN	Asia ...	Ship	IPV	Azuileja ...	...	Ship
IMO	Marina O ...	Ship	IPW	S. Giusto ...	...	Ship
IMQ	Alband...	Ship	IPY	Praga ...	...	Ship
IMR	Conte Rosso ...	Ship	IPZ	Memfi ...	...	Ship
IMT	Tirreno ...	Ship	IQF	Emanuele		
IMU	Scivia ...	Ship		Accame ...	...	Ship
IMV	Favignane ...	Ship	IQO	Cadore ...	...	Ship
IMX	Tolemaide ...	Ship	IQV	Tivoli ...	...	Italy
IMY	Angelo Brunetti	Ship	IQW	Ancona ...	...	Italy
INA	Montello ...	Ship	IQX	Trieste Radio		Italy
INE	Citta di Trieste	Ship	IQZ	Pola ...	...	Italy
INF	Orione ...	Ship	IRG	Massaua Radio		Eritrea
ING	Capri ...	Ship	IRM	Murano ...	...	Italy
INH	Marco Minghetti	Ship	IRT	Mersa Fatma ...	...	Abyssinia
INI	Regina d'Italia	Ship	ISB	Merka ...	...	Italian
INJ	Pola ...	Ship				Somalil'd
INK	Gagliari ...	Ship	ISC	Brava ...	...	Italian
INL	Sicilia ...	Ship				Somalil'd
INM	Milano ...	Ship	ISD	Giumbo ...	...	Italian
INN	Angelo Toso ...	Ship				Somalil'd
INO	Primula ...	Ship	ISE	Mogadiscio ...	...	Italian
INP	Citta di Tripoli	Ship				Somalil'd
INQ	Etruria ...	Ship	ISF	Mahaddei Uen		Italian
INR	Roma ...	Ship				Somalil'd
INS	Sardegna ...	Ship	ISG	Mogadiscio ...	...	Italian
INT	Porto di					Somalil'd
	Alessandretta	Ship	ISH	Iscia Uaidoa ..	...	Italian
INV	Porto di Savona	Ship				Somalil'd

ISI	Oddur ...	...	Italian	IVJ	Montecristo ...	Ship
ISJ	Bulo Burti ...	...	Somalil'd	IVK	Hunguria ...	Ship
ISM	Itala ...	...	Italian	IVL	Brenta ...	Ship
ISN	Bardera ...	...	Somalil'd	IVM	Timavo ...	Ship
ISO	Lugh ...	...	Italian	IVN	Marina ...	Ship
ISAAE	M.1 ...	...	Somalil'd	IVO	Cherca ..	Ship
ISAAF	M.14 ...	...	Italian	IVP	Montegrappa	Ship
ISAAG	F.6 ...	...	Somalil'd	IVR	Salina ...	Ship
ISAAH	O.8 ...	...	Italian	IVS	Merano ...	Ship
ITA	Teresa O. ...	...	Somalil'd	IVT	Trieste ...	Ship
ITB	Bologna ...	...	Air	IVU	Cleopatra ...	Ship
ITC	Confidenza ...	...	Air	IVW	Scampolo ...	Ship
ITE	Rosalia ...	...	Air	IVX	Piave ...	Ship
ITF	Colombo ...	...	Air	IVY	Helouan ...	Ship
ITG	Monginevro ...	...	Ship	IVZ	Semiramis ...	Ship
ITH	Monviso ...	...	Ship	IWA	Salvatore ...	Ship
ITI	Capodimonte ...	...	Ship	IWB	Ida ...	Ship
ITJ	Caboto ...	...	Ship	IWC	Citta Di Lecce	Ship
ITK	Dora Baltea ...	...	Ship	IWD	Francesco	
ITL	Cerea ...	...	Ship		Ciampa ...	Ship
ITN	Sori ...	...	Ship	IWE	Citta di	
ITO	Armando ...	...	Ship		Palermo	Ship
ITP	Argentina ...	...	Ship	IWF	Patras ...	Ship
ITQ	Francesca ...	...	Ship	IWG	Alberto ...	Ship
ITT	Laura ...	...	Ship	IWH	Stromboli ...	Ship
ITU	Umorio ...	...	Ship	IWI	Caprera ...	Ship
ITV	Ninfa ...	...	Ship	IWJ	Etna ...	Ship
ITW	Castel Porziano	...	Ship	IWK	Zovetto ...	Ship
ITX	Belvedere ...	...	Ship	IWL	Antonio ...	Ship
ITY	Josto ...	...	Ship	IWM	Columbia ...	Ship
ITZ	Marzocco ...	...	Ship	IWN	Circe ...	Ship
IUA	Garibaldi ...	...	Ship	IWO	Leon Pancaldo	
IUB	S. Marco ...	...	Ship		Speranza ...	Ship
IUC	Vittorio Veneto	...	Ship	IWP	Carniola ...	Ship
IUD	Goffredo Mameli	...	Ship	IWQ	Savona ...	Ship
IUE	Valdano ...	...	Ship	IWR	Mariquita ...	Ship
IUF	Juno ...	...	Ship	IWT	Virginia ...	Ship
IUH	Dante Alighieri	...	Ship	IWU	Eliopoli ...	Ship
IUI	Citta di Bengasi	...	Ship	IWW	Moncalieri ...	Ship
IUJ	Tracia ...	...	Ship	IWY	Vittorio ...	Ship
IUK	Angelo			IWZ	Tevere ...	Ship
	Scarsellini ...	...	Ship	IXA	Leopolis ...	Ship
IUL	Legnano ...	...	Ship	IXB	Alcana ...	Ship
IUN	Nicolo II ...	...	Ship	IXC	Iside ...	Ship
IUO	Vallarso ...	...	Ship	IXE	Persia ...	Ship
IUP	Trento ...	...	Ship	IXH	Columba ...	Ship
IUQ	Calimeris ...	...	Ship	IXJ	Minerva ..	Ship
IUR	Ansaldo III ...	...	Ship	IXK	Giglio ...	Ship
IUS	Tortona ...	...	Ship	IXN	Rodi ...	Ship
IUT	Padova ...	...	Ship	IXO	Bagnoli ...	Ship
IUU	Adelina ...	...	Ship	IXP	Ansaldo II ...	Ship
IUV	Giuseppe Verdi	...	Ship	IXR	Giulio Cesare ...	Ship
IUW	Ugo Bassi ...	...	Ship	IXT	Moncenisio ...	Ship
IUX	Loredano ...	...	Ship	IXV	Ansaldo ...	Ship
IUY	Aster ...	...	Ship	IXW	Adriatico ...	Ship
IUZ	Barbarigo ...	...	Ship	IXX	Rosario ...	Ship
IVA	Aurania ...	...	Ship	IXY	Agnello Ciampa	Ship
IVC	Scilfin ...	...	Ship	IXAAA	Angelo	
IVD	Titania ...	...	Ship		Berardi ...	Air
IVF	Marte ...	...	Ship	IYA	Veniero ...	Ship
IVG	Eugenio Cantoni	...	Ship	IYB	Rodosto ...	Ship
IVH	Monte Neyoso	...	Ship	IYC	Orseold ...	Ship
IVI	Ansaldo S.			IYD	Tebe ...	Ship
	Giorgio I ...	...	Ship	IYF	Tocra ...	Ship
				IYG	Bucovina ...	Ship
				IYH	Roma II ...	Ship
				IYI	Indiana ...	Ship
				IYJ	Rovato ...	Ship
				IYK	Nicolaos ...	Ship

IYL	Fert ...	Ship	JAGA	Tachibana ...	Ship
IYM	Princessa		JAHA	Taiyo ...	Ship
IYN	Mafalda ...	Ship	JAIA	Koki Maru ...	Ship
IYO	Vincenzo Florio	Ship	JAJA	Urrupu Maru ...	Ship
IYP	Abbazia ...	Ship	JAKA	Baikal Maru ...	Ship
IYQ	Vittoria ...	Ship	JALA	Seine Maru ...	Ship
IYR	Campania ...	Ship	JAMA	Rakuyo Maru...	Ship
IYS	Re D'Italia ...	Ship	JANA	Venice Maru ..	Ship
	Tommaso di		JAQA	Bandai Maru ...	Ship
	Savoia ...	Ship	JARA	Miyaura Maru	Ship
IYT	Taormina ...	Ship	JASA	Iwatesan Maru	Ship
IYU	Principe di		JATA	Paris Maru ...	Ship
	Udine ...	Ship	JAUA	Woyo Maru ...	Ship
IYV	Pollenzo ...	Ship	JAVA	Dainichi Maru	Ship
IYW	Bracciano ...	Ship	JAWA	Wales Maru ...	Ship
IYX	Elettrico ...	Ship	JBA	Meichi Maru ...	Ship
IYY	Resurrezione ...	Ship	JBB	Shinbu Maru...	Ship
IYZ	Caserta ...	Ship	JBC	Calcutta Maru	Ship
IZA	America ...	Ship	JBD	Ataka Maru ...	Ship
IZB	D Aosta ...	Ship	JBE	Capetown Maru	Ship
IZC	Albaro ...	Ship	JBG	Bingo Maru ...	Ship
IZD	Procida ...	Ship	JBH	Kureha Maru ...	Ship
IZE	Tusculum ...	Ship	JBI	Mikesan Maru	Ship
IZF	Coltana ...	Ship	JBK	Horaisan Maru	Ship
IZH	Ansaldo			Sakigake Maru	
	Savoia II ...	Ship		No. 3 ...	Ship
IZI	Italia ...	Ship	JBK	Kaifuku Maru	Ship
IZJ	Racconigi ...	Ship	JBL	Tsurugisan Maru	Ship
IZK	Sestri ...	Ship	JBM	Azuma Maru ...	Ship
IZM	Rosignano ...	Ship	JBN	Genmei Maru ..	Ship
IZN	Roverbella ...	Ship	JBO	Hudson Maru	Ship
IZO	Vulcano ...	Ship	JBP	Alps Maru ...	Ship
IZP	Esperia ...	Ship	JBQ	Kofuku Maru	Ship
IZQ	Vesuvio ...	Ship	JBR	Siberia Maru ...	Ship
IZR	Palachy ...	Ship	JBS	Azumasan Maru	Ship
IZS	Cuzco ...	Ship	JBT	Tosa Maru ...	Ship
IZT	Duca D'Aostar	Ship	JBU	Yubari Maru ...	Ship
IZU	Nyppon ...	Ship	JBV	Ikomasan Maru	Ship
IZV	Re Vittorio ...	Ship	JBX	Hakushika Maru	Ship
IZX	Esperia ...	Ship	JBZ	Brazil Maru ...	Ship
IZY	Sirte ...	Ship	JBCA	Ibaragi Maru ...	Ship
IZZ	Duca Degli		JBEA	Amatori Maru	Ship
	Abruzzi ...	Ship	JBFA	Banri Maru ...	Ship
	M.6 ...	Air	JBGA	Harunasan Maru	Ship
IZAAC	Iwaki Radio ...	Japan	JBIA	Tenshin Maru	Ship
JAA	Yoko Maru ...	Ship	JBIA	Yctorofu Maru	Ship
JAB	American Maru	Ship	JBJA	Taioku Maru ...	Ship
JAC	Aden Maru ...	Ship	JBKA	Ginvo Maru ...	Ship
JAD	Yaye Maru ...	Ship	JBLA	Usuri Maru ...	Ship
JAE	Yuri Maru ...	Ship	JBMA	Maniu Maru ...	Ship
JAF	England ...	Ship	JBNA	Bengal Maru ...	Ship
JAG	Italy Maru ...	Ship	JBQA	Unvo Maru ...	Ship
JAH	Aki Maru ...	Ship	JBRA	Meikai Maru ...	Ship
JAI	France Maru ...	Ship	JCA	Akita Maru ...	Ship
JAJ	Muroran Maru	Ship	ICB	Chicago ...	Ship
JAK	Alaska Maru ...	Ship	JCC	Canada Maru ...	Ship
JAL	Yugawo Maru...	Ship	JCD	Celebes Maru ...	Ship
JAQ	Atlas Maru ...	Ship	JCE	Hanaski Maru	Ship
JAP	Kaigen, Maru	Ship	JCF	Nanking Maru	Ship
JAQ	Amur Maru ...	Ship	JCG	Tensho Maru ...	Ship
JAR	Bankoku Maru	Ship	JCH	Nagano ...	Ship
JAS	Atsuta Maru ...	Ship	JCI	China Maru ...	Ship
JAT	Koshun Maru	Ship	JCJ	Keishin Maru	Ship
JAV	Awa Maru ...	Ship	JCK	Borneo Maru ...	Ship
JAW	Yehime Maru	Ship	JCL	Lima Maru ...	Ship
JAX	Anyo Maru ...	Ship	JCM	Tenkai Maru ..	Ship
JAY	Amazon Maru...	Ship	JCN	Oridono Maru	Ship
JAZ	Maye Bashi Maru	Ship	JCO	Yamagata Maru	Ship
JAEA	Taian Maru ...	Ship	JCP	Baltimore Maru	Ship
Jafa			JCQ		

JCR	Indus Maru ...	Ship	JET	Hokuto Maru	Ship
JCS	Chosi ...	Japan	JEU	Taibu Maru ...	Ship
JCT	Yeitai Maru ..	Ship	JEV	Saigon Maru ...	Ship
JCU	Sumatra Maru	Ship	JEW	Ume Maru ...	Ship
JCV	Shinkoku Maru	Ship	JEX	Yoro Maru No. 2	Ship
JCW	Cheribon Maru	Ship	JEY	Nagato Maru ...	Ship
JCY	Yoshida Maru		JEZ	Saikai Maru ...	Ship
	No. 3 ...	Ship	JEBA	Kaito Maru ...	Ship
JCZ	Clyde Maru ...	Ship	JFA	Hayo Maru ...	Ship
JCCA	Musashi Maru	Ship	JFB	Inaho Maru ...	Ship
JCDA	Matsumoto ...	Ship	JFC	Fuku Maru ...	Ship
JCEA	Chitose Maru ...	Ship	JFD	Meidai Maru ...	Ship
JCGA	Hayabusa Maru	Ship	JFE	Altai Maru ...	Ship
JCLA	London Maru	Ship	JFF	Fuji Maru ...	Ship
JCMA	Koshu ...	Ship	JFG	Yeifuku Maru...	Ship
JCNA	Norfolk Maru	Ship	JFH	Kishun Maru ...	Ship
JCPA	Omi Maru ...	Ship	JFI	Tama Maru ...	Ship
JCOA	Yamashiro Maru	Ship	JFJ	Fukukai Maru	Ship
JCUA	Chikugo Maru	Ship	JFK	Pukikaku ...	Japan
JDA	Dairenwan ...	Japan	JFK	Keelung Radio	Japan
JDB	Mitsuki Maru ...	Ship	JFL	Kofuko Maru ...	Ship
JDC	Yuki Maru ...	Ship	JFM	Fushimi Maru..	Ship
JDD	Tofuku Maru ...	Ship	JFO	Koan Maru ...	Ship
JDE	Wugo Maru ...	Ship	JFP	Pering Maru ...	Ship
JDF	Africa Maru ...	Ship	JFO	Hoyeisan Maru	Ship
JDG	Meiten Maru ...	Ship	JFR	Hozui Maru ...	Ship
JDH	Shinpo Maru ...	Ship	JFS	Tomiura Maru	Ship
JDI	Delagoa Maru...	Ship	JFT	Taito Maru ...	Ship
JDJ	Denmark Maru	Ship	JFU	Andes Maru ...	Ship
JDK	Chikuzen Maru	Ship	JFV	Mewu Maru ...	Ship
JDL	Harve Maru ...	Ship	JFX	Hirafu Maru ...	Ship
JDN	Annan Maru ...	Ship	JFZ	Tosan Maru ...	Ship
JDO	Meiko Maru ...	Ship	JFAA	Amakusa Marui	Ship
JDP	Suki Maru ...	Ship	JFCA	Busho Maru ...	Ship
JDQ	Luzon Maru ...	Ship	JFDA	Kishu Maru ...	Ship
JDR	Penang Maru ...	Ship	JGA	Shikishima ...	Ship
JDS	Indo Maru ...	Ship	JGB	Asahi ...	Ship
JDT	Hirosaki Maru	Ship	JGC	Mikasa ...	Ship
JDU	Java Maru ...	Ship	JGD	Hizen ...	Ship
JDV	Komagata Maru	Ship	JGE	Mutsu ...	Ship
JDW	Ceylon Maru ...	Ship	JGF	Katori ...	Ship
JDX	Kirin Maru ...	Ship	JGG	Kashima ...	Ship
JDY	Rangoon Maru	Ship	JGH	Kaga ...	Ship
JDZ	Arizona Maru...	Ship	JGI	Tosa ...	Ship
JDCA	Ujina Maru ...	Ship	JGJ	Satsuma ...	Ship
JDFA	Gifu Maru ...	Ship	JGK	Aki ...	Ship
JDJA	Osumi Maru ...	Ship	JGL	Nagato... ..	Ship
JDLA	Yoroppa Maru	Ship	JGM	Settsu ...	Ship
JDMA	Taishin Maru ...	Ship	JGN	Fuso ...	Ship
JDNA	Tensho Maru ...	Ship	JGO	Yamashiro ...	Ship
JEA	Arabia Maru ...	Ship	JGP	Ise ...	Ship
JEB	Heinan Maru ..	Ship	JGO	Ikoma ...	Ship
JEC	Sungshan Maru	Ship	JGR	Kurama ...	Ship
JED	Egypt Maru ...	Ship	JGS	Anagi ...	Ship
JEE	Taikai Maru ...	Ship	JGT	Ibuki ...	Ship
JEF	Shinsei Maru ...	Ship	JGU	Kongo ...	Ship
JEH	Otaru Maru ...	Ship	JGV	Hiej ...	Ship
JEI	Sapporo Maru		JGW	Kirishima ...	Ship
	No. 1 ...	Ship	JGX	Haruna ...	Ship
JEJ	Havre Maru ...	Ship	JGY	Hiuga ...	Ship
JEK	Koci Maru ...	Ship	JGZ	Akagi ...	Ship
JFL	Erie Maru ...	Ship	JGRA	Kobun Maru	Ship
JEM	Malay Maru ...	Ship	JHA	Konan Maru ...	Ship
JEM	Himalaya Maru	Ship	JHB	Harbin Maru ...	Ship
JEN	Etna Maru ...	Ship	JHC	Havana Maru	Ship
JEQ	Kaisho Maru ...	Ship	JHD	Genchu Maru ...	Ship
JEP	Ganges Maru ...	Ship	JHE	Shikano Maru...	Ship
JEQ	Yesaki Maru ...	Ship	JHF	Totomi Maru	Ship
JER	Rashu Maru ...	Ship	JHG	Hakone Maru	Ship

JHI	Ypres Maru ...	Ship	JKX	Kashima Maru	Ship
JHJ	Horomushiro		JKY	Kiyo Maru ...	Ship
	Radio ...	Japan	JLA	Kuma ...	Ship
JHK	Kifuku Maru ...	Ship	JLB	Chitose...	Ship
JKL	Raifuku Maru...	Ship	JLC	Tsugaru ...	Ship
JHM	Hofuku Maru	Ship	JLD	Tama ...	Ship
JHO	Yeboshi Maru	Ship	JLE	Abukuma ...	Ship
JHP	Kibi Maru No. 6	Ship	JLF	Tone ...	Ship
JHQ	Surabaya Maru	Ship	JLG	Chikuma ...	Ship
JHR	Hambrug Maru	Ship	JLH	Kitakami ...	Ship
JHS	Kimi Maru ...	Ship	JLI	Kiso ...	Ship
JHT	Keifuku Maru...	Ship	JLJ	Hirato ...	Ship
JHU	Bombay Maru	Ship	JLK	Yahagi ...	Ship
JHV	Taiho Maru ...	Ship	JLL	Suma ...	Ship
JHW	Hawaii Maru ...	Ship	JIM	Akashi ...	Ship
JHX	Hague Maru ...	Ship	JLN	Nutaka ...	Ship
JHY	Hayatori Maru	Ship	JLO	Tsushima ...	Ship
JHZ	Chifuku Maru	Ship	JLP	Tenryu...	Ship
JIA	Ryufuku Maru	Ship	JIQ	Tatsuta ...	Ship
JIB	Inaba Maru ...	Ship	JLR	Owi ...	Ship
JIC	Batavia Maru	Ship	JLS	Nagaro...	Ship
JID	Gosan Maru ...	Ship	JIT	Isuzu ...	Ship
JIE	India Maru ...	Ship	JLU	Natori ...	Ship
JIF	Nissei Maru ...	Ship	JLV	Yura ...	Ship
JIG	Kotsu Maru ...	Ship	JLW	Kinu ...	Ship
JIH	Yoshida Maru		JLX	Kako ...	Ship
	No. 1 ...	Ship	JLY	Naka ...	Ship
JII	Yeikoku Maru	Ship	JMA	Tsushima Maru	Ship
JIJ	Belgium Maru	Ship	JMB	Hakodate Maru	Ship
JKK	Jufuku Maru ...	Ship	JMC	Boston Maru ...	Ship
JIL	Iki Maru ...	Ship	JMP	Mokpo ...	Japan
JIN	Haruna Maru ...	Ship	JMQ	Mishima Maru	Ship
JIO	Kosoku Maru ...	Ship	JMR	Manila Maru ...	Ship
JIP	Kaian Maru ...	Ship	JMS	Ural San Maru	Ship
JIQ	Jinsho Maru ...	Ship	JMT	Malta Maru ...	Ship
JIR	Madras Maru ...	Ship	JMU	Kurushima Maru	Ship
JIS	Victoria Maru	Ship	JMV	Mito Maru ...	Ship
JIT	Portland Maru	Ship	JMW	Matsuvama	Ship
JIU	Washington Maru	Ship	JMX	Mexico Maru ...	Ship
JIV	Heijin Maru ...	Ship	JMY	Milan Maru ...	Ship
JIW	Yone Maru ...	Ship	JMZ	Maizuru ...	Japan
JIX	Yomei Maru ...	Ship	JNA	Kanagawa Maru	Ship
JIY	Sanfrancisco		JNB	Naples Maru ...	Ship
	Maru ...	Ship	JNC	Yonan Maru ...	Ship
JIZ	Vancouver Maru	Ship	JND	Neisei Maru ...	Ship
JJC	Funabashi Radio	Japan	JNE	Honolulu Maru	Ship
JKA	Kamo Maru ...	Ship	JNF	Alabama Maru	Ship
JKC	Chefoo Maru ...	Ship	JNG	Malacca Maru	Ship
JKD	Koyo Maru ...	Ship	JNH	Meigen Maru ...	Ship
JKE	Chili Maru ...	Ship	JNI	Miye Maru ...	Ship
JKF	Kumano Maru	Ship	JNJ	Argun Maru ...	Ship
JKG	Kagi Maru ...	Ship	JNK	Takaoka ...	Ship
JKH	Karachi Maru...	Ship	JNL	Nokko Maru ...	Ship
JKI	Sakaki Maru ...	Ship	JNM	Shanghai Maru	Ship
JKJ	Kiso Maru ...	Ship	JNN	Hankow Maru	Ship
JKK	Kaikyu Maru ...	Ship	JNP	Sydney Maru ...	Ship
JKL	Koma Maru ...	Ship	JNR	Caroline Maru...	Ship
JKM	Komonto ...	Japan	JNT	Kifunosan Maru	
JKN	Kitano Maru ...	Ship		No. 2 ...	Ship
JKO	Kasuga Maru ...	Ship	JNU	Dover Maru ...	Ship
JKP	Heimei Maru ...	Ship	JNV	Macassar Maru	Ship
JKQ	Durban Maru ...	Ship	JNW	Norway Maru	Ship
JKR	Katori Maru ...	Ship	JNX	Manshu Maru	Ship
JKS	Kosai Maru ...	Ship	JNZ	Nishiyama Maru	Ship
JKT	Kasado Maru ...	Ship	JOA	Kochi Maru ...	Ship
JKU	Kunajiri Maru	Ship	JOB	Koso Maru ...	Ship
JKV	Fukuyo Maru ...	Ship	JOC	Otchishi Radio	Japan
JKW	Dakar Maru ...	Ship	JOD	Yoshino Maru...	Ship
JKX	Taisan Maru ...	Ship	JOE	Myogisan Maru	Ship

JOF	Matsue Maru ...	Ship	JSK	Shiragi Maru ...	Ship
JOG	Ogasawarra Maru	Ship	JSL	Genoa Maru ...	Ship
JOH	Ohio Maru ...	Ship	JSM	Shiomisaki ...	Japan
JOI	Iwate Maru ...	Ship	JSN	Shinano Maru...	Ship
JOJ	Sekko Maru ...	Ship	JSP	Singapore Maru	Ship
JOK	Morioka Maru...	Ship	JSQ	Shunko Maru ...	Ship
JOL	Lisbon Maru ...	Ship	JSR	Saga Maru ...	Ship
JOM	Lyons Maru ...	Ship	JSS	Shoseito ...	Japan
JON	Okinawa Maru	Ship	JST	Seattle Maru ...	Ship
JOO	Reiyo Maru ...	Ship	JSU	Suwa Maru ...	Ship
JOP	Oregon Maru ...	Ship	JSV	Shingo Maru ...	Ship
JOR	Holland Maru...	Ship	JSW	Seikai Maru ...	Ship
JOS	Osezaki Radio	Ship	JSX	Shimotsui ...	Japan
JOT	Otori Maru ...	Ship	JSY	Seiyo Maru ...	Ship
JOU	Kashu Maru ...	Ship	JSZ	Shidzuoka Maru	Ship
JOV	Toyon Maru ...	Ship	JTA	Tacoma Maru...	Ship
JOX	Tamon Maru		JTB	Tamba Maru ...	Ship
	No. 8 ...	Ship	JTC	Taichu Maru ...	Ship
JOY	Choyo Maru ...	Ship	JTD	Texas Maru ...	Ship
JOZ	Rozan Maru ...	Ship	JTE	Themes Maru ...	Ship
JPA	Tsuruga Maru	Ship	JTF	Tone Maru ...	Ship
JPB	Bornea Maru ...	Ship	JTG	Tango Maru ...	Ship
JPC	Kawachi Maru	Ship	JTH	Fukoyo Hoshu	
JPD	Biyo Maru ...	Ship		Maru ...	Ship
JPE	Pacific Maru ...	Ship	JTI	Tyne Maru ...	Ship
JPF	Toba Maru ...	Ship	JTK	Taikwa Maru ...	Ship
JPG	Kaga Maru ...	Ship	JTL	Tsushima Maru	Ship
JPH	Haruna Maru ...	Ship	JTM	Taisei Maru ...	Ship
JPI	Meiyo Maru ...	Ship	JTN	Tainan Maru ...	Ship
JPJ	Tajima ...	Ship	JTP	Tamatsu Maru	Ship
JPK	Hakata Maru ...	Ship	JTQ	Tokushima Maru	Ship
JPL	Liverpool Maru	Ship	JTR	Tamura Maru	Ship
JPM	Panama Maru...	Ship	JTS	Tsunoshima ...	Japan
JPN	Portsaid Maru	Ship	JTT	Atlantic Maru...	Ship
JPO	Iyo Maru ...	Ship	JTU	Taketoyo Maru	Ship
JPP	Persia Maru ...	Ship	JTV	Tsurushima Maru	Ship
JPQ	Tottort Maru ...	Ship	JTW	Otomari Radio	Japan
JPR	Kamakura Maru	Ship	JTX	Toyana Maru ...	Ship
JPS	Sanuki Maru ...	Ship	JTY	Tenyo Maru ...	Ship
JPT	Toyohashi Maru	Ship	JTZ	Kabafuto Maru	Ship
JPU	Tatsuno Maru...	Ship	JUC	Fuji ...	Ship
JPV	Chosen Maru ...	Ship	JUD	Iwami ...	Ship
JPW	Wakasa Maru	Ship	JUG	Suwo ...	Ship
JPX	Buyo Maru ...	Ship	JUK	Okinoshima ...	Ship
JPY	Shinyo Maru ...	Ship	JUL	Mishima ...	Ship
JPZ	Tempaisan Maru	Ship	JUN	Jingei ...	Ship
JQY	Takao ...	Ship	JUO	Hashidate ...	Ship
JQZ	Atago ...	Ship	JUP	Chiyoda ...	Ship
JRA	Asama ...	Ship	JUQ	Akitsushima ...	Ship
JRB	Tokiwa ...	Ship	JUR	Wakamiya ...	Ship
JRC	Yakumo ...	Ship	JUS	Shokaku ...	Ship
JRD	Adzuma ...	Ship	JUT	Manshu ...	Ship
JRF	Iwate ...	Ship	JUU	Komahashi ...	Ship
JRG	Idzumo Jintsu	Ship	JUV	Karasaki ...	Ship
JRJ	Kusuga ...	Ship	JUX	Yamato ...	Ship
JRK	Nisshin ...	Ship	JUY	Musashi ...	Ship
JRL	Aso ...	Ship	JWA	Seta ...	Ship
JRM	Kii ...	Ship	JWB	Chihaya ...	Ship
JRN	Owari ...	Ship	JWC	Yodo ...	Ship
JRP	Sendai ...	Ship	JWD	Mogami ...	Ship
JRPA	Baikal Maru ...	Ship	JWE	Nakoso ...	Ship
JSA	Rasajima ...	Japan	JWF	Uji ...	Ship
JSB	Shogetsubito ...	Japan	JWG	Sumida ...	Ship
JSC	Suez Maru ...	Ship	JWH	Katata ...	Ship
JSD	Sado Maru ...	Ship	JWI	Hira ...	Ship
JSE	Spain Maru ...	Ship	JWJ	Fushimi ...	Ship
JSF	Sweden Maru ...	Ship	JWK	Toba ...	Ship
JSG	Glasgow Maru	Ship	JWL	Saga ...	Ship
JSH	Shinyo Maru ...	Ship	JWM	Hozu ...	Ship

JYA	Atagosan Maru	Ship	KCB	Liepaja ...	Latvia
JYC	Oura Maru ...	Ship	KCC	Ventspils ...	Latvia
JYD	Yawata Maru	Ship	KCF	Velta ...	Ship
JYE	Yubae Maru ...	Ship	KCG	Sigulda ...	Ship
JYF	Nankai Maru ...	Ship	KCH	Krimulda ...	Ship
JYG	Amagisan Maru	Ship	KCI	Turaida ...	Ship
JYH	Yokohama Maru	Ship	KCJ	Dagmar ...	Ship
JYI	Yayoi Maru ...	Ship	KCL	Virsaitis ...	Ship
JYJ	Mandasani Maru	Ship	KCU	Luderitz Bay ...	S.W.
JYK	Kinkasan ...	Ship			Africa
JYL	Korea ...	Ship	KCW	Weser Lightship	Germany
JYM	Tsuyama Maru	Ship	KCX	Cuxhaven ...	Germany
JYN	Somedono Maru	Ship	KDA	Philadelphia	
JYO	Toyoooka Maru	Ship		KDA ...	Ship
JYP	Hokkai Maru ...	Ship	KDB	Carracas ...	Ship
JYQ	Kongosan Maru	Ship	KDC	Laramie ...	U.S.A.
JYS	Yakumo Maru	Ship	KDD	Cartago ...	Ship
JYU	Minamioagari-jima ...	Japan	KDE	Carillo ...	Ship
	Ayaha ...	Ship	KDF	Coppename ...	Ship
JYV	Tokiwa Maru ...	Ship	KDG	Parismina ...	Ship
JYW	Siam Maru ...	Ship	KDH	Heredia ...	Ship
JYX	Burma Maru ...	Ship	KDI	Abangarez ...	Ship
JYY	Hozan Maru ...	Ship	KDJ	S Jose KDJ ...	Ship
JYZ	Daressalaam ...	East	KDK	Atenas ...	Ship
KAC		Africa	KDL	Levisa ...	Ship
			KDM	Maracaibo ...	Ship
KAF	Amrum Bank		KDN	San Francisco	U.S.A.
	Lightship ...	Germany	KDO	Sanctore ...	Ship
KAG	Adlergrund		KDR	Limon ...	Ship
	Lightship ...	Germany	KDS	Sixalao... ..	Ship
KAH	Helgoland ...	Germany	KDT	Turrialba ...	Ship
KAJ	Eider Lightship	Germany	KDU	Point Reyes ...	U.S.A.
KAK	Swakopmund	East	KDV	Libby Maine ...	Ship
		Africa	KDW	Nakat Inlet ...	Alaska
KAL	List F.S. ...	Germany	KDY	Walter D. Noyes	Ship
KAN	Wilhelmshaven	Germany	KDZ	Zulia ...	Ship
KAO	List F.R.A. ...	Germany	KDAB	Hog Island ...	U.S.A.
KAP	Pillau F.S. ...	Germany	KDAC	Sinasta... ..	Ship
KAU	Assenjade		KDAD	Agwisun ...	Ship
	Lightship ...	Germany	KDAF	Peconic ...	Ship
KAV	Norddeich ...	Germany	KDAG	M. M. Davis ...	Ship
KAW	Swinemünde ...	Germany	KDAH	Fairport ...	U.S.A.
KAY	Stolpmünde ...	Germany	KDAK	Van Camp No. 11	Ship
KAZ	Danzig ...	Danzig	KDAM	West Notus ...	Ship
KBC	Fehmarnbelt		KDAN	West Kebar ...	Ship
	Lightship ...	Germany	KDAP	West Kedron	Ship
KBE	Warnemünde ...	Germany	KDAR	President Monroe	Ship
KBF	Elbe lightship	Germany	KDAS	Siskiyou ...	Ship
KBH	Bremerhaven		KDAT	Pomona ...	Ship
	Lloydhalle ...	Germany	KDAV	Dartford ...	Ship
KBJ	Eider Lightship		KDAW	City of Fort	
KBK	Bulk F.S. ...	Germany		Worth ...	Ship
KBL	Eiderlotsen-gallote Light-ship ...	Germany	KDAX	Antinuou ...	Ship
	Lome ...	French W	KDAY	Tollosa KDAY	Ship
		Africa	KDAZ	William Campion	Ship
KBL			KDBA	Depere ...	Ship
KBM	Borkum Light	Germany	KDBB	Topatopa ...	Ship
KBN	Nordholz ...	Germany	KDBC	Agwimoon ...	Ship
KBO	Borkum ...	Germany	KDBF	Eagle KDBF	Ship
KBQ	Nordholtz F.R.A.	Germany	KDBG	Edris ...	Ship
KBR	Borkum Riff		KDBH	Forest King	Ship
	Lightship ...	Germany	KDBI	Trinity KDBI...	Ship
KBU	Duala ...	French W	KDBJ	Steel Worker ...	Ship
		Africa	KDBK	Maud ...	Ship
KBV	Sassnitz ...	Germany	KDBL	West Carmagor	Ship
KBY	Warnemünde		KDBM	Meton ...	Ship
	F.R.A. ...	Germany	KDBN	Cananova ...	Ship
KCA	Riga ...	Latvia	KDBP	Chester Kiwanis	Ship
			KDBQ	Sutorpco ...	Ship

KDBR	Sunewco ...	Ship	KDEH	Salt Lake ...	U.S.A.
KDBS	Surailco ...	Ship	KDEJ	Elko ...	U.S.A.
KDBT	Durango KDBT	Ship	KDEK	Reno ...	U.S.A.
KDBU	Haymon ...	Ship	KDEL	S. Louis ...	U.S.A.
KDBV	S. Isabel ...	Ship	KDEL	Bryan ...	U.S.A.
KDBW	Sawokla ...	Ship	KDEM	Baytown ...	Ship
KDBX	Mount Clay ...	Ship	KDEN	Dearborn ...	U.S.A.
KDBY	Albert Jeffress	Ship	KDEP	Northville ...	U.S.A.
KDBZ	Apus ...	Ship	KDEQ	Hoboken ...	Ship
KDCA	Hybert... ..	Ship	KDER	Carrabulle ...	Ship
KDCB	Sapulpa ...	Ship	KDES	Carplaka ...	Ship
KDCD	James Otis ...	Ship	KDET	Geo. L. Harvey	Ship
KDCE	Mobile City ...	Ship	KDEV	Gladysbe ...	Ship
KDCF	Rotarian ...	Ship	KDEW	Philip Publicker	Ship
KDCG	Independence		KDEX	Cody ...	Ship
	Hall ...	Ship	KDEY	Sudurco ...	Ship
KDCH	Pachet ...	Ship	KDEZ	Eastern Temple	Ship
KDCI	Hudson KDCI	Ship	KDFA	Hyder ...	Alaska
KDCI	President Fill-		KDFB	New Orleans	
	more... ..	Ship		KDFB ...	Ship
KDCJ	Egeria ...	Ship	KDFC	Potter ...	Ship
KDCK	Delivery No. 5	Ship	KDFD	Gateway City...	Ship
KDCL	George Washing-		KDFE	Provincetown	Ship
	ton KDCL ...	Ship	KDFF	Castana ...	Ship
KDCM	President Cleve-		KDFG	Catahoula ...	Ship
	land ...	Ship	KDFH	Tomalvai ...	Ship
KDCN	Atlanta of Texas	Ship	KDFI	Sulanierco ...	Ship
KDCO	Houston KDCO	Ship	KDFJ	Sudawsonco ...	Ship
KDCP	Halo KDCP ...	Ship	KDFK	Suscolanco ...	Ship
KDCQ	Mosella ...	Ship	KDFM	Manatawny ...	Ship
KDCR	Haynie... ..	Ship	KDFO	Halway ...	Ship
KDCS	Hollywood ...	Ship	KDFR	Hannawa ...	Ship
KDCT	Palo Alto ...	Ship	KDFS	Janelew ...	Ship
KDCU	Mevania ...	Ship	KDFT	Mursa ...	Ship
KDCV	West Canon ...	Ship	KDFU	Jeptha ...	Ship
KDCW	Jalapa ...	Ship	KDFV	Lavada ...	Ship
KDCX	Steel Engineer	Ship	KDFW	West Carmona	Ship
KDCY	Surinam ...	Ship	KDFX	West Honaker	Ship
KDCZ	Mount Vernon	Ship	KDFY	Winneconne ...	Ship
KDDA	Red Hook ...	Ship	KDFZ	East Hampton	Ship
KDDB	I. C. White ...	Ship	KDGA	Hera... ..	Ship
KDDC	Algic ...	Ship	KDGE	Galveston ...	Ship
KDDE	Lorraine Cross	Ship	KDGG	Kekoskee ...	Ship
KDDF	Yaka ...	Ship	KDGH	BayouChico ...	Ship
KDDG	Theodore F.		KDGI	Steel Ranger ...	Ship
	Reynolds ...	Ship	KDGL	John Stevens ...	Ship
KDDH	Sumanco ...	Ship	KDGM	Donna Lane ...	Ship
KDDI	Sutermco ...	Ship	KDGN	Clement Smith	Ship
KDDJ	John Englis ...	Ship	KDGO	Muskegon ...	Ship
KDDK	Carlton ...	Ship	KDGP	Elisha Walker...	Ship
KDDL	Hastings ...	Ship	KDGR	Lake Gano ...	Ship
KDDM	Careno ...	Ship	KDGS	City of Rayville	Ship
KDDN	Steel Exporter	Ship	KDGT	Tulsa ...	U.S.A.
KDDO	Suduffco ...	Ship	KDGU	Quincy ...	U.S.A.
KDDP	Surico ...	Ship	KDGV	William Penn	Ship
KDDQ	Susherico ...	Ship	KDGW	China Arrow ...	Ship
KDDR	Halsey ...	Ship	KDGX	Bonnie Brook	Ship
KDDS	Stockton KDDS	Ship	KDGY	Nora ...	Ship
KDDT	Derblay ...	Ship	KDHA	Suricho ...	Ship
KDDU	Heber ...	Ship	KDHB	Suremico ...	Ship
KDDV	Culberson ...	Ship	KDHC	Harvester KDHC	Ship
KDDY	S. Eulalia ...	Ship	KDHD	Edgar F. Coney	Ship
KDDZ	Cassimir ...	Ship	KDHF	President Van	
KDEA	Lake Fernwood	Ship		Buren ...	Ship
KDEB	Gulfstar ...	Ship	KDHG	Pagasset ...	Ship
KDEC	Syros ...	Ship	KDHH	Charles H. Cramp	Ship
KDED	Lena Luckenbach	Ship	KDHI	Intrepid ...	Ship
KDEE	Omaha ...	U.S.A.	KDHJ	Bibbco ...	Ship
KDEG	Cheyenne ...	U.S.A.	KDHK	Yapalaga ...	Ship

KDHL	Argosy ...	Ship	KDKH	Algonquin ...	Ship
KDHM	North Platte ...	U.S.A.	KDKK	KDKH ...	Ship
KDHN	Rock Springs ...	U.S.A.	KDKL	Minnekahda ...	Ship
KDHO	Japan Arrow ...	Ship	KDKM	Camden KDKL	Ship
KDHP	India Arrow ...	Ship	KDKN	Natirar ...	Ship
KDHO	Java Arrow ...	Ship	KDKP	Dinsmore ...	Ship
KDHR	J. Fletcher ...	Ship	KDKQ	Lake Gatun ...	Ship
	Farrell ...	Ship	KDKR	Rodman Swift ...	Ship
KDHS	Wm. Boyce ...	Ship	KDKS	Warbler KDKR	Ship
	Thompson ...	Ship	KDKU	Willett ...	Ship
KDHT	S. Veronica ...	Ship	KDKX	Dan. F. Hanlon ...	Ship
KDHU	Lilmae ...	Ship	KDKY	W. J. Hanna ...	Ship
KDHV	Brush ...	Ship	KDLA	Peacock KDKY	Ship
KDHX	A. A. Daugherty ...	Ship	KDLB	Charlie Watson ...	Ship
KDHY	Eastern Leader ...	Ship	KDLC	President Hayes ...	Ship
KDHZ	Dawn ...	Ship	KDLD	Pearldon ...	Ship
KDIB	Rawlins ...	U.S.A.	KDLE	Suwarinco ...	Ship
KDIC	Ferris Oil Field ...	U.S.A.	KDLF	Suwordenco ...	Ship
KDID	Medon ...	Ship	KDLG	Sujameco ...	Ship
KDIF	Hanley ...	Ship	KDLH	Reaper ...	Ship
KDIG	Narbo ...	Ship		Franklin K. ...	Ship
KDIH	Narcissus ...	Ship		Lane ...	Ship
KDIJ	Cuprum ...	Ship	KDLJ	Artemis KDLJ	Ship
KDIK	West Cussetta ...	Ship	KDLK	Cuba KDLK ...	Ship
KDIL	Griffidu ...	Ship	KDLL	A. L. Kent ...	Ship
KDIM	George E. Weed ...	Ship	KDLM	Wacosta ...	Ship
KDIN	Colin H. Livingstone ...	Ship	KDLN	Henry S Grove ...	Ship
	Vaba ...	Ship	KDLO	Tuscaloosa City ...	Ship
KDIP	Cederhurst ...	Ship	KDLS	Sugillenco ...	Ship
KDIQ	Lake Ontario ...	Ship	KDLT	George Pierce ...	Ship
KDIR	Lakebridge ...	Ship	KDLU	Blue point ...	Ship
KDIS	Lake Superior ...	Ship	KDLW	Herman Frasch ...	Ship
KDIT	Lakeshore ...	Ship	KDLX	Mary Luckenbach ...	Ship
KDIV	Lake Weir ...	Ship	KDLY	Sugarland ...	U.S.A.
KDIW	Lakeview ...	Ship	KDLZ	Galveston ...	U.S.A.
KDIX	Lake Dunmore ...	Ship	KDMB	Agwisea ...	Ship
KDIY	Lake George ...	Ship	KDMC	Agwimars ...	Ship
KDIZ	Fort George ...	Ship	KDKD	Agwiworld ...	Ship
KDJB	Lakewood ...	Ship	KDME	Moffitt ...	Ship
KDJC	Lake Traverse ...	Ship	KDMH	Memnon ...	Ship
KBJD	Vittorio ...	Ship	KDMI	Namasket ...	Ship
KDJF	Emmanuele ...	Ship	KDMJ	Peralta ...	Ship
	Lake Stirling ...	Ship	KDMK	Fort Worth ...	U.S.A.
KDJF	Westmount ...	Ship	KDML	S. C. T. Dodd ...	Ship
KDJG	Westboro ...	Ship	KDMM	Nacata ...	Ship
KDJH	Chetopa ...	Ship	KDMN	John Worthington ...	Ship
KDJI	Yalza ...	Ship		Muriel ...	Ship
KDJK	Steel Inventor ...	Ship	KDMO	W. H. Libby ...	Ship
KDJL	Storm King ...	Ship	KDMP	Wolvering State ...	Ship
KDJM	Oneida KDJO ...	Ship	KDMQ	W. S. Miller ...	Ship
	Kiowa KDJP ...	Ship	KDMS	Samuel L. Fuller ...	Ship
KDJO	Cayuga KDJO ...	Ship	KDMT	Joseph M. ...	Ship
KDJP	Onondaga KDJR ...	Ship		Cudahy ...	Ship
KDJO	Chippewa KDJS ...	Ship	KDMU	Wichita ...	Ship
KDJR	Daly ...	Alaska	KDMV	City of Elwood ...	Ship
KDJS	Warren ...	Alaska	KDMY	P. J. Reilly ...	Ship
KDJT	Joseph Seep ...	Ship	KDMZ	District of ...	Ship
KDJU	Romagne ...	Ship		Columbia ...	Ship
KDJV	Natchez KDJY ...	Ship	KDNA	Isleo (El) ...	Ship
KDJX	Montgomery ...	Ship	KDND	Quinalt ...	Ship
KDJY	City ...	Ship	KDNF	Dewey KDNF ...	Ship
KDJZ	Harrisburg ...	U.S.A.	KDNG	Swiftsure ...	Ship
KDKA	Eastern Sword ...	Ship	KDNH	Sujerseyco ...	Ship
KDKB	Hopatcong ...	Ship	KDNI	Sunewarkco ...	Ship
KDKC	Emergency Aid ...	Ship	KDNJ	Kingfisher ...	Ship
KDKD	William H. ...	Ship	KDNK	M. F. Elliott ...	Ship
KDKG	Doheny ...	Ship	KDNL	Durham KDNL ...	Ship
			KDNM	Wisdom II ...	Ship

KDNN	Agwilake ...	Ship	KDQM	Aladdin KDQM	Ship
KDNO	Gulf King ...	Ship	KDQN	Fall River	
KDNP	City of Dalhart	Ship		Valley	U.S.A.
KDNR	Lake Miraflores	Ship	KDQQ	Pocantico ...	Ship
KDNS	Yorba Linda ...	Ship	KDQR	John C. Kirk-	
KDNV	President Pierce	Ship		Patrick ...	Ship
KDNW	Lago ...	Ship	KDQS	Cerro Ebano ...	Ship
KDNX	Sunuggetco ...	Ship	KDQT	Mount Carroll	Ship
KDNY	Favorite KDNY	Ship	KDQU	Sea Monarch ...	Ship
KDNZ	Gorgona KDNZ	Ship	KDQV	Swift Scout ...	Ship
KDOB	Ala ...	Ship	KDQW	Cairo KDQW	Ship
KDOC	Cebu ...	Ship	KDQX	S. Louis KDQX	Ship
KDOD	Livingstone Roe	Ship	KDQY	Cerro Azul ...	Ship
KDOF	Bessemer City	Ship	KDQZ	Frank G. Drum	Ship
KDOH	Crampton		KDRA	Fearless ...	Ship
	Anderson ...	Ship	KDRB	Gulf Prince ...	Ship
KDOI	Consort ...	Ship	KDRC	Agwismith ...	Ship
KDOJ	Sea Lion ...	Ship	KDRD	R. J. Hanna ...	Ship
KDOK	Albert E. Watts	Ship	KDRE	K. R. Kingsbury	Ship
KDOL	F. C. Latrobe ...	Ship	KDRH	Ruby ...	Alaska
KDOM	Annapolis		KDRI	Acropolis ...	Ship
	KDOM ...	Ship	KDRJ	Selma City ...	Ship
KDOQ	Richmond		KDRK	Swift Eagle ...	Ship
	KDOQ ...	Ship	KDRL	President Adams	Ship
KDOR	Thomas H.		KDRM	Henry D.	
	Wheeler ...	Ship		Whiton ...	Ship
KDOS	Swift Arrow ...	Ship	KDRN	E. W. Sinclair	Ship
KDOT	President		KDRP	Suphenco ...	Ship
	Jefferson ...	Ship	KDRQ	Manulani ...	Ship
KDOW	American		KDRR	Delphine ...	Ship
	KDOW ...	Ship	KDRS	Mindoro ...	Ship
KDOY	Westland KDOY	Ship	KDRT	Cuba KDRT ...	Ship
KDOY	Livingstone ...	Ship	KDRU	Luzon ...	Ship
KDOZ	President Polk	Ship	KDRV	Mount Clinton	Ship
KDPA	President		KDRW	Buckeye State	Ship
	Jackson ...	Ship	KDRX	Agwiavre ...	Ship
KDPB	Minneapolis ...	U.S.A.	KDRY	Nixon Fork ...	Alaska
KDPC	Suspearco ...	Ship	KDRZ	Tulsagas ...	Ship
KDPD	Mauna Kea ...	Ship	KDSA	Swift Light ...	Ship
KDPE	Gargoyle ...	Ship	KDSB	Thomas Crowley	Ship
KDPF	Swiftstar ...	Ship	KDSC	Vicksburg ...	Ship
KDPG	Liebre ...	Ship	KDSE	Astra ...	Ship
KDPH	Detroit... ..	U.S.A.	KDSF	Manukai ...	Ship
KDPI	Superior ...	U.S.A.	KDSG	Anniston City	Ship
KDPJ	Port Huron ...	U.S.A.	KDSH	Hambro ...	Ship
KDPK	Franklin KDPK	Ship	KDSI	Swift Wind ...	Ship
KDPL	Walter Jennings	Ship	KDSJ	Undaunted	
KDPM	Cleveland ...	U.S.A.		KDSJ ...	Ship
KDPN	Arden ...	Ship	KDSK	Gloria West ...	Ship
KDPO	Agwistone ...	Ship	KDSL	President	
KDPP	Kennecott ...	Ship		McKinley ...	Ship
KDPQ	Tux Panoil ...	Ship	KDSM	Nashaba ...	Ship
KDPR	Montebello ...	Ship	KDSN	West Lewark ...	Ship
KDPS	Baytown ...	U.S.A.	KDSO	Lio ...	Ship
KDPU	Cascada ...	U.S.A.	KDSP	Dixiano ...	Ship
KDPV	Camp 60 ...	U.S.A.	KDSQ	Sea Ranger ...	Ship
KDPW	Camp 61 ...	U.S.A.	KDSR	Agwibay ...	Ship
KDPX	Placentia (La)	Ship	KDSS	Puente ...	Ship
KDPY	Fairfield City ...	Ship	KDST	Tecomate ...	Ship
KDPZ	Gold Star KDPZ	Ship	KDSU	Toteco... ..	Ship
KDQA	Chicago ...	U.S.A.	KDSV	President Wilson	Ship
KDQB	Ward ...	Ship	KDSW	Atlanta City ...	Ship
KDQC	Cincinnati ...	U.S.A.	KDSX	West Faralon ...	Ship
KDQF	Jeff Davis ...	Ship	KDSY	Sea Scout ...	Ship
KDQG	Oldham ...	Ship	KDSZ	Illinois KDSZ	Ship
KDQH	Meanticut ...	Ship	KDTA	Liberator KDTA	Ship
KDQI	West O'Rowa	Ship	KDTB	Bohemian Club	Ship
KDQJ	Solana ...	Ship	KDTC	President Gar-	
KDQL	Sucubaco ...	Ship		field ...	Ship

KDTD	David McKelvy	Ship	KDVO	Marwhal ...	Ship
KDTE	Playa ...	Ship	KDVR	President Madi-	
KDTF	Betty, R. ...	Ship		son ...	Ship
KDTG	Yankee Arrow	Ship	KDVR	Bay State ...	Ship
KDTH	Three-Hundred		KDVS	Jacob T. Kopp	Ship
	and twenty-		KDVT	Dixie Arrow ...	Ship
	three ...	Ship	KDVU	Kinge and Winge	Ship
KDTI	Nourmahal ...	Ship	KDVV	H. M. Storey ...	Ship
KDTJ	Hammac ...	Ship	KDVW	Steel Scientist	Ship
KDTK	Colonial KDTK	Ship	KDVX	Baton Rouge	
KDTL	Nevada II ...	Ship		KDVX ...	Ship
KDTM	American Legion	Ship	KDVG	Memphis ...	Ship
KDTN	Hamer ...	Ship	KDVZ	Centurion KDVZ	Ship
KDTP	Thomas P. Beal	Ship	KDWA	Clifford F. Moll	Ship
KDTQ	J. N. Pew ...	Ship	KDWB	John. J. Boland	Ship
KDTR	Bowdoin ...	Ship	KDWC	Lolomi ...	Ship
KDTS	Memphis City ...	Ship	KDWD	New Jersey	
KDTT	Iowa City ...	U.S.A		KDWD ...	Ship
KDTU	Adler KDTT ...	Ship	KDWE	Yosemite KDWE	Ship
KDTV	J. A. Moffett Jr.	Ship	KDWF	All America ...	Ship
KDTE	West Greylock	Ship	KDWH	Asher J. Hudson	Ship
KDTW	Tustem ...	Ship	KDWH	Munargo ...	Ship
KDTX	Patricia KDTX	Ship	KDWI	Equator ...	Ship
KDTY	Half Moon KDTY	Ship	KDWJ	Spray ...	Ship
KDTZ	Southern Cross	Ship	KDWW	President Hard-	
KDUB	Harry Yates ...	Ship		ing ...	Ship
KDUC	Lubrico ...	Ship	KDWL	Steel Navigator	Ship
KDUD	Knoxville City	Ship	KDWM	Wogo ...	Ship
KDUF	Speejacks ...	Ship	KDWN	Byron D. Benson	Ship
KDUG	Empire Arrow ...	Ship	KDWO	Alpha ...	Ship
KDUH	Louis R. David-		KDWP	W. S. Rheem ...	Ship
	son ...	Ship	KDWQ	Delaware Sun	Ship
KDUJ	William T.		KDWR	Invader ...	Ship
	Roberts ...	Ship	KDWS	President Taft	Ship
KDUK	West Prospect	Ship	KDWS	Peninsula State	Ship
KDUL	Theodore H.		KDWT	Yankton ...	Ship
	Wickwire, Jr.	Ship	KDWU	Fortuna ...	Ship
KDUM	John D. Arch-		KDWW	Bethore ...	Ship
	bold ...	Ship	KDWX	Cathay ...	Ship
KDUN	Ripple ...	Ship	KDWY	Federal KDWY	Ship
KDUP	Guinevere ...	Ship	KDWZ	Pan America ...	Ship
KDUR	T. J. Williams	Ship	KDXA	Fort McHenry	Ship
KDUS	Sapphire KDUS	Ship	KDXB	Fidius ...	Ship
KDUT	Pine Tree State	Ship	KDXC	Allen KDXC ...	Ship
KDUV	Margaret Dollar	Ship	KDXD	Stuart Dollar ...	Ship
KDUW	Celestial ...	Ship	KDXE	Jacop Lucken-	
	Chattanooga			bach ...	Ship
	City ...	Ship	KDXF	Jota (La) ...	Ship
KDUX	G. N. Wilson ...	Ship	KDXG	Daniel Kern ...	Ship
KDUY	Hoosier State ...	Ship	KDXH	Leviathan ...	Ship
KDUZ	President Lincoln	Ship	KDXI	Oriental ...	Ship
KDVA	M. A. Reeb ...	Ship	KDXJ	G. A. Tomlinson	Ship
KDVB	Tamiahua ...	Ship	KDXK	F. R. Hazard ...	Ship
KDVC	Polillo ...	Ship	KDXL	E. D. Pierce ...	Ship
KDVE	Gertrude ...	Ship	KDXM	Frank Billings...	Ship
KDVF	Levant Arrow	Ship	KDXN	Polynesia ...	Ship
	Robt. E Hopkins	Ship	KDXO	Australia KDXO	Ship
	Adam E. Corn-		KDXP	Amazon ...	Ship
	elius ...	Ship	KDXQ	A. A. Augustus	Ship
KDVG	Faith KDVG ...	Ship	KDXR	Price McKinney	Ship
KDVH	West Chopaka	Ship	KDXS	Harold B. Nye	Ship
KDVI	Wm. Rockefeller	Ship	KDXT	John Stanton	Ship
KDVJ	La Purisima ...	Ship	KDXU	Joseph G. Butler	Ship
KDVK	Purisima ...	Ship	KDXV	J. J. Sullivan ...	Ship
KDVL	F. H. Hillman	Ship	KDXW	James P. Walsh	Ship
KDVM	Berkenhead ...	Ship	KDXX	J. T. Hutchinson	Ship
KDVN	H. T. Harper ...	Ship	KDXY	Martin Mullen...	Ship
KDVO	Steel Seafarer	Ship	KDXZ	William A. Paine	Ship
	Samuel Q. Brown	Ship	KDYA	Resolute KDYA	Ship

KDYB	Spray KDYB	Ship	KEU	S. V. Harkness	Ship
KDYC	Viking KDYC...	Ship	KEV	Cagayan de Sulu	Philippine Islands
KDYD	Californian ...	Ship			
KDYE	Reliance ...	Ship	KEW	Balabac ...	Philippine Islands
KDYF	Bernice ...	Ship			
KDYG	Boy Scout ...	Ship	KEY	Cape Edwards	Alaska
KDYH	Irages ...	Ship	KEZ	S. Lorenzo KEZ	Ship
KDYI	Western World	Ship	KEBD	Abron ...	Ship
KDYJ	Meteor ...	Ship	KEBF	Edgefield ...	Ship
KDYK	H. F. Alexander	Ship	KEBM	Lake Giltedge	Ship
KDYL	Salt Lake City	U.S.A.	KEBN	Lake Girth ...	Ship
KDYM	San Diego ...	U.S.A.	KEBP	Lake Farabee	Ship
KDYN	Redwood City...	U.S.A.	KEBQ	West Henshaw	Ship
KDYO	San Diego ...	U.S.A.	KEBR	Lake Strabo ...	Ship
KDYP	Anvil ...	Ship	KEBS	Jekyl ...	Ship
KDYQ	Portland ...	U.S.A.	KEBT	Nesco ...	Ship
KDYR	Pasadena ...	U.S.A.	KEBV	Lake Flushing	Ship
KDYS	Great Falls ...	U.S.A.	KEBX	Remus ...	Ship
KDYT	Astoria... ..	Ship	KEBZ	Lambs ...	Ship
KDYU	Klamath Falls	U.S.A.	KECB	Edenton ...	Ship
KDYV	Salt Lake City	U.S.A.	KECG	Chicago Bridge	Ship
KDYW	Phoenix ...	U.S.A.	KECJ	Decatur Bridge	Ship
KDYX	Honolulu ...	Hawaiian Islands	KECK	Hico ...	Ship
			KECL	Opelika	Ship
KDYY	Denver... ..	U.S.A.	KECM	Lake Gitano ...	Ship
KDYZ	Dolphin ...	Ship	KECN	Lake Fannin ...	Ship
KDZA	Tueson ...	U.S.A.	KECR	West Tacook ...	Ship
KDZB	Bakersfield ...	U.S.A.	KECS	Duquesne ...	Ship
KDZC	Theodore H. Wickwire ...	Ship	KECV	Lake Flynus ...	Ship
			KECX	West Imboden	Ship
KDZD	Los Angeles...	U.S.A.	KEDG	Kamesit ...	Ship
KDZF	Los Angeles ...	U.S.A.	KEDJ	Marne KEDJ	Ship
KDZG	San Francisco	U.S.A.	KEDK	Onekama ...	Ship
KDZH	Fresno ...	U.S.A.	KEDM	Lake Faribault	Ship
KDZI	Wenatchee ...	U.S.A.	KEDN	Baracoa ...	Ship
KDZJ	Eugene ...	U.S.A.	KEDP	Lake Farley ...	Ship
KDZK	Reno ...	U.S.A.	KEDQ	West Maximus	Ship
KDZL	Ogden ...	U.S.A.	KEDR	Western Glen ...	Ship
KDZM	Centralia ...	U.S.A.	KEDT	West Quechee...	Ship
KDZN	Calcite ...	Ship	KEDV	West Nosska ...	Ship
KDZO	Marore ...	Ship	KEDX	West Hardaway	Ship
KDZP	Los Angeles ...	U.S.A.	KEDZ	West Hargrave	Ship
KDZQ	Denver... ..	U.S.A.	KEFB	Sac City ...	Ship
KDZR	Bellingham ...	U.S.A.	KEFC	West Carnifax	Ship
KDZS	Guarina ...	Ship	KEFD	Bar Harbor ...	Ship
KDZV	Pacific KDZV	Ship	KEFJ	Copalgrove ...	Ship
KDZY	G. S. Allyn ...	Ship	KEFK	Cerro-Gardo ...	Ship
KEA	Seldovia ...	Alaska	KEFL	Chamberino ...	Ship
KEB	Sabine ...	Ship	KEFM	Lake Inaha ...	Ship
KEC	Concho... ..	Ship	KEFN	Lake Friar ...	Ship
KED	Siasi ...	Philippine Islands	KEFP	Lake Frio ...	Ship
			KEFQ	Western Knight	Ship
KEE	West Catanace	Ship	KEFR	Ossining ...	Ship
KEF	Henry R. Mallory	Ship	KEFS	West Harlan ...	Ship
KEG	Rio Grande KEG	Ship	KEFT	City of Eureka	Ship
KEI	Medina... ..	Ship	KEFX	West Harshaw	Ship
KEJ	Alamo ...	Ship	KEFZ	West Harts ...	Ship
KEK	S. Marcos ...	Ship	KEGC	Bristol ...	Ship
KEL	Isonomia ...	Ship	KEGF	Eclipse ...	Ship
KEM	Comal ...	Ship	KEGG	Chamblee ...	Ship
KEN	S. Diego ...	U.S.A.	KEGJ	Chaparel ...	Ship
KEO	Bongoa ...	Philippine Islands	KEGK	Chantier ...	Ship
			KEGL	Lake Foxcraft	Ship
KEP	Lampasas ...	Ship	KEGM	Dirigo ...	Ship
KEQ	Port Walter ...	Alaska	KEGN	Lake Frolono ...	Ship
KER	H. M. Flagler ...	Ship	KEGP	Lake Frugality	Ship
KER	Kereinik ...	Spain	KEGR	Lake Frohna ...	Ship
KES	S. Jacinto ...	Ship	KEGS	West Hartland	Ship
KET	Bolinas ...	U.S.A.	KEGT	West Hartley ...	Ship

KEGX	West	Ship	KEPP	Lake Ellenorah	Ship
KEJD	Hassayampa	Ship	KEPQ	Proctor ...	Ship
KEJF	Easterling ...	Ship	KEPR	Sahale ...	Ship
KEJG	Western Alley ...	Ship	KEPT	Saco ...	Ship
KEJJ	Lake Fraichur	Ship	KEPV	Wallingford ...	Ship
KEJK	Lake Fraley ...	Ship	KEQB	Dallas KEQB	Ship
KEJL	Lake Grainger	Ship	KEQJ	Baldrock ...	Ship
KEJN	Lake Grama ...	Ship	KEQK	Belvidere ...	Ship
KEJP	Lake Fanbush	Ship	KEQM	Lake Ellerslie	Ship
KEJQ	Lake Faulk ...	Ship	KEQN	Lake Ellicott ...	Ship
KEJS	Cabegon ...	Ship	KEQP	Lake Festina ...	Ship
KEJT	West Armagosa	Ship	KEQR	Galahad ...	Ship
KEJV	D. F. McAllister	Ship	KEQV	Pisco KEQV ...	Ship
KEJX	Faraby ...	Ship	KEQX	Salaverry ...	Ship
KEKB	Transportation	Ship	KERF	Star of Green-	Ship
KEKC	East Wind ...	Ship		land ...	Ship
XEKC	Scally ...	Ship	KERG	Shooters Island	Ship
KEKD	Norma... ..	Ship	KERJ	West Erral ...	Ship
KEKG	Corbalt... ..	Ship	KERM	Lake Festus ...	Ship
KEKJ	Lake Grampian	Ship	KERN	Lake Fibre ...	Ship
KEKL	Lake Grampus	Ship	KERP	Lake Fielding	Ship
KEKM	Saguache ...	Ship	KERO	Yesoking ...	Ship
KEKN	Lake Fansdale	Ship	KERR	Benoni ...	Ship
KEKP	Lake Fanquier	Ship	KERT	Bethelridge ...	Ship
KEKQ	Lake Furlough	Ship	KERX	Miller County	Ship
KEKR	Castlewood ...	Ship	KERZ	Cecil County ...	Ship
KEKS	Homestead ...	Ship	KESB	Lake Foxboro...	Ship
KEKT	Tartar	Ship	KESC	Sacandaga ...	Ship
KEKZ	Oscoda... ..	Ship	KESD	Castle Point ...	Ship
KELB	Bluffton ...	Ship	KESG	Sapinero ...	Ship
KELC	North Pole ...	Ship	KESK	Lake Flovilla ...	Ship
KELG	Polar Star ...	Ship	KESM	Lake Fife ...	Ship
KELK	Buckhannon ...	Ship	KESN	Lake Figar ...	Ship
KELM	West Elcajon ...	Ship	KESP	Lake Fighting	Ship
KELN	Lake Fernando	Ship	KESQ	Bidwell ...	Ship
KELQ	Lake Ferrona...	Ship	KESR	Hampden Roads	Ship
KELS	Prusa	Ship	KESV	City of Freeport	Ship
KELZ	Damacan ...	Ship	KESX	Warwick KESX	Ship
KEMJ	Nawitka ...	Ship	KESZ	Henry Clay ...	Ship
KEMK	Panay	Ship	KETG	Braddock ...	Ship
KEML	Hoxie	Ship	KETM	Askawake ...	Ship
KEMM	Jacox	Ship	KETN	Edgehill ...	Ship
KEMN	Covalt	Ship	KETP	Edgemont ...	Ship
KEMP	Covedale ...	Ship	KETX	Georgina Rolph	Ship
KEMX	Covena	Ship	KETZ	Annette Rolph	Ship
KEMZ	Tavernilla ...	Ship	KEVB	Osawatomie ...	Ship
KENC	West Vaca ...	Ship	KEVD	West Corum ...	Ship
KEND	Ballenas ...	Ship	KEVF	Edgemoor ...	Ship
KENG	East Cape ...	Ship	KEVG	Eldena	Ship
KENJ	Triumph ...	Ship	KEVJ	Fort Seward ...	Ship
KENK	West Avenal ...	Ship	KEVM	Nishmaha ...	Ship
KENL	West Compo ...	Ship	KEVN	Osaqumsick ...	Ship
KENM	West Modus ...	Ship	KEVP	Ozette	Ship
KENN	Coverun	Ship	KEVR	Hartwood ...	Ship
KENP	Elabeto	Ship	KEVS	Chappell ...	Ship
KENQ	Lake Elkwood	Ship	KEVT	Schodack ...	Ship
KENR	Ballew	Ship	KEVV	Schoharie ...	Ship
KENS	Itompa	Ship	KEVX	Tollard... ..	Ship
KENV	Cabrille ...	Ship	KEVZ	Lake Faresman	Ship
KENX	Ballcamp ...	Ship	KEXB	McKeesport	Ship
KEPD	Clincho	Ship	KEXF	West Munham	Ship
KEPF	Diablo	Ship	KEXG	West Nohno ...	Ship
KEPG	Mercer	Ship	KEXJ	West Togus ...	Ship
KEPJ	Agwistar ...	Ship	KEXK	West Totant ...	Ship
KEPK	Brevard	Ship	KEXL	Lake Folcroft	Ship
KEPL	Briarcliff ...	Ship	KEXM	Wawalona ...	Ship
KEPM	Aledo	Ship	KEXN	Monine	Ship
KEPN	Lake Elkwater	Ship	KEXP	Cineas	Ship
	Lake Ellendale	Ship	KEXO	South Bend ...	Ship

KEXR	Grand Haven ...	Ship	KGP	Ponce ...	Ship
KEXS	Milwaukee ...	Ship	KGQ	Edward Lucken- bach	Ship
KEXT	Peter H. Crowell	Ship	KGR	Cambridge KGR	Ship
KEXV	Hoven ...	Ship	KGS	Senator Bailey	Ship
KEXX	West Cajoot ...	Ship	KGT	Princess KGT	Ship
KEXZ	Glymont ...	Ship	KGU	Honolulu ...	Hawaiian Islands
KEZB	Lake Sapor ...	Ship	KGV	Castle Lodge ...	Ship
KEZC	Lake Fonda ...	Ship	KGW	Portland ...	U.S.A.
KEZD	Lake Fontana	Ship	KGX	Senalls Point ...	Ship
KEZF	Lake Fontanet	Ship	KGY	Lacey ...	U.S.A.
KEZJ	Lake Gilboa ...	Ship	KGAE	New Windsor ...	Ship
KEZK	Lake Gilpen ...	Ship	KGOE	Lake Harney ...	Ship
KEZL	Lake Gilta ...	Ship	KGUE	Caribbean ...	Ship
KEZM	West Harcover	Ship	KGUI	Apex ...	Ship
KEZN	West Hembrie	Ship	KHA	Uyak ...	Alaska
KEZP	West Hematite	Ship	KHB	Kvichak ...	Alaska
KEZQ	Glyndon ...	Ship	KHC	Chignik ...	Alaska
KEZR	West Celina ...	Ship	KHE	Lake Silver ...	Ship
KEZZ	Poughkeepsie ...	Ship	KHF	Snag Point ...	Alaska
KFA	City of Columbus	Ship	KHG	Clark's Point ...	Alaska
KFB	City of Atlanta	Ship	KHH	S. Francisco ...	U.S.A.
KFC	Seattle ...	U.S.A.	KHI	Los Angeles ...	U.S.A.
KFD	Lake Janet ...	Ship	KHJ	Los Angeles ...	U.S.A.
KFE	Wynooche ...	Ship	KHK	Wahiawa ...	Hawaiian Islands
KFF	Frieda KFF ...	Ship	KHL	Lahaina ...	Hawaiian Islands
KFG	Feltore ...	Ship	KHM	Lihue ...	Hawaiian Islands
KFH	West Ashawa ...	Ship	KHN	Kawaihae ...	Hawaiian Islands
KFI	Los Angeles ...	U.S.A.	KHO	Kaunakakai ...	Hawaiian Islands
KFJ	City of Augusta	Ship	KHP	Mangore ...	Ship
KFK	City of Savannah	Ship	KHQ	Seattle ...	U.S.A.
KFL	Seattle ...	U.S.A.	KHR	J. W. Van Dyke	Ship
KFM	Camp 61 G ...	U.S.A.	KHS	H. C. Folger ...	Ship
KFN	Tormentor ...	Ship	KHU	Lake Ogden ...	Ship
KFO	Buccaneer ...	Ship	KHV	Lake Jessup ...	Ship
KFP	Nacoochee ...	Ship	KHW	Lake Charles ...	Ship
KFQ	Owego ...	Ship	KHZ	Mystic ...	Ship
KFR	Los Angeles ...	U.S.A.	KIA	Ardmobe ...	Ship
KFS	San Francisco	U.S.A.	KIB	Muskogee ...	Ship
KFT	Everett ...	U.S.A.	KIC	Standard KIC...	Ship
KFU	Nantucket ...	Ship	KID	Matinicock ...	Ship
KFV	Pearl Creek Dome	Alaska	KIE	Kahuku ...	Hawaiian Islands
KFV	Yakima ...	U.S.A.	KIF	Davao ...	Philippine Islands
KFW	Freedom ...	Ship	KIG	Pioneer KIG ...	Ship
KFY	City of Mont- gomery ...	Ship	KIH	Corning ...	Ship
KFZ	Spokane ...	U.S.A.	KIJ	Acme ...	Ship
KFAA	City of St. Louis	Ship	KIK	Westerner ...	Ship
KFAG	Missourian ...	Ship	KIL	Jolo ...	Philippine Islands
KFAH	Bayonne KFAH	Ship	KIM	Latouche ...	Alaska
KFAI	Pilgrim KFAH	Ship	KIN	Patrol KIN ...	Ship
KFAI	Glendola ...	Ship	KIO	Brynilda ...	Ship
KFAL	Dolly C. ...	Ship	KIP	General W. C. Gorgas ...	Ship
KFAM	Hamilton KFAM	Ship	KIQ	Astral ...	Ship
KFAO	Glendoyle ...	Ship	KIR	Eagle KIR ...	Ship
KFEO	Monana ...	Ship	KIS	Marshall ...	Alaska
KGA	Coamo ...	Ship	KIT	Tiger KIT ...	Ship
KGC	Kanatak ...	U.S.A.	KIU	Western Hero...	Ship
KGD	Suruga ...	Ship	KIV	Puerto Princessa	Philippine Islands
KGE	Westwego ...	Ship			
KGF	Pomona ...	U.S.A.			
KGG	Portland ...	U.S.A.			
KGH	Hillsboro' ...	U.S.A.			
KGJ	S. Juan KGJ ...	Ship			
KGK	Edgar F. Lucken- bach ...	Ship			
KGL	Dochra... ..	Ship			
KGM	Mexicano ...	Ship			
KGN	Portland ...	U.S.A.			
KGO	Altadena ...	U.S.A.			

KIW	Zamboanga ...	Philippine Islands	KIGP	Gratia ...	Ship
KIX	Cuyo ...	Philippine Islands	KIGR	Blair ...	Ship
KIY	San Jose ...	Philippine Islands	KIGS	Harry Luckenbach ...	Ship
KIZ	Malabang ...	Philippine Islands	KIGT	Bessemer ...	Ship
KIBB	Lake Glebe ...	Ship	KIGX	Yaklok... ..	Ship
KIBC	Silverbrook ...	Ship	KIGZ	Ashbee ...	Ship
KIBD	Shenandoah ...	Ship	KIJB	Lake Candelaria	Ship
KIBF	Milwaukee Bdge.	Ship	KIJC	Balsam... ..	Ship
KIBG	National Bridge	Ship	KIJD	Barrenfork ...	Ship
KIBJ	Passaic Bridge	Ship	KIJF	Barryton ...	Ship
KIBK	Opequan ...	Ship	KIJG	Wicasta ...	Ship
KIBL	Masca ...	Ship	KIJJ	Sabotawan ...	Ship
KIBM	Wisconsin Bridge	Ship	KIJK	Kisnop ...	Ship
KIBN	S. Malta ...	Ship	KIJL	Edellyn ...	Ship
KIBO	Saugus ...	Ship	KIJM	Schroon ...	Ship
KIBR	Craftsman KIBR	Ship	KIJN	Knoxville ...	Ship
KICN	Eldridge ...	Ship	KIJP	Montgomery ...	Ship
KICP	West Idlay ...	Ship	KIJQ	Hoxbar ...	Ship
KICO	West Isleta ...	Ship	KIJR	Barstow ...	Ship
KICR	Gaffney ...	Ship	KIJS	Butterfield ...	Ship
KICS	Zarembo ...	Ship	KIJT	Buttercup ...	Ship
KICV	Gunston Hall ...	Ship	KIJV	Bethlehem Bdge.	Ship
KICZ	Admiral Evans	Ship	KIJX	Brasher ...	Ship
KIDB	Lake Granby ...	Ship	KIJZ	Dade County ...	Ship
KIDC	Satartia ...	Ship	KIKB	Hillsborough County ...	Ship
KIDD	West Alcoz ...	Ship	KIKC	Jackson ...	Ship
KIDF	Hegira ...	Ship	KIKC	Schuykill Bridge	Ship
KIDJ	Mulpua ...	Ship	KIKD	Johnson City ...	Ship
KIDL	Genesee KIDL	Ship	KIKF	Jefferson County	Ship
KIDM	Anniston ...	Ship	KIKG	S. Johns County	Ship
KIDN	Chattanooga	Ship	KIKJ	S. Augustine ...	Ship
KIDP	KIDN ...	Ship	KIKK	Shortsville ...	Ship
KIDQ	Louisville Bridge	Ship	KIKL	Worcester ...	Ship
KIDR	Schoodic ...	Ship	KIKM	West Kasson ...	Ship
KIDS	Romulus KIDR	Ship	KIKO	Ambridge ...	Ship
KIDT	Lake Canaveral	Ship	KIKR	Clairton ...	Ship
KIDV	Barrallton ...	Ship	KIKX	West Islip ...	Ship
KIDW	Waukau ...	Ship	KILF	Elmsport ...	Ship
KIDX	Waukegan ...	Ship	KILI	Edmore ...	Ship
KIDZ	Orleans KIDZ	Ship	KILK	Colorado Springs	Ship
KIFB	West Irmo ...	Ship	KILL	City of Spokane	Ship
KIFC	Hukey ...	Ship	KILM	Waxahachie ...	Ship
KIFD	West Canaval	Ship	KILN	Neshaminy ...	Ship
KIFG	Favourite KIFG	Ship	KILP	Meriden ...	Ship
KIFJ	Kishacoquillas	Ship	KILR	Scantic... ..	Ship
KIFK	Chautaugua ...	Ship	KILT	West Calumb ...	Ship
KIFL	Stellaris ...	Ship	KILV	Ipswich ...	Ship
KIFN	Humrick ...	Ship	KILX	Monasses ...	Ship
KIFP	West Conob ...	Ship	KILZ	West Cawthorn	Ship
KIFO	Bound Brook ...	Ship	KIMB	Tuckanuck ...	Ship
KIFR	Barranca KIFR	Ship	KIMC	Tripp ...	Ship
KIFV	Andrea F. Luckenbach ...	Ship	KIMD	Deer Lodge ...	Ship
KIFX	Youngstow ...	Ship	KIMG	West Chetac ...	Ship
KIFZ	Lorain ...	Ship	KIMJ	Cushnoc ...	Ship
KIGB	Lake Glencoe ...	Ship	KIMM	Winyah ...	Ship
KIGC	Humacenna ...	Ship	KIMN	Salvation Lass	Ship
KIGD	Hulver ...	Ship	KIMO	East Side ...	Ship
KIGF	Seekonk ...	Ship	KIMR	Dochet ...	Ship
KIGG	Walden ...	Ship	KIMS	Burnwell ...	Ship
KIGH	S. Elisa ...	Ship	KIMT	Mount Evan ...	Ship
KIGI	Director KIGJ	Ship	KIMV	Lake Cannonsburg ...	Ship
KIGK	Intan ...	Ship	KIMX	Orinoco ...	Ship
KIGL	Polybius ...	Ship	KIMZ	Pipestone County	Ship
KIGM	Lake Farlin ...	Ship	KINB	Ogontz ...	Ship
			KINC	Hyannis ...	Ship
			KIND	Rock Island ...	Ship

KINF	Costigan ...	Ship	KISN	Lake Fagundas ...	Ship
KING	Watertown ...	Ship	KISP	Lake Fairlie ...	Ship
KINJ	Lake Fabyan ...	Ship	KISQ	Afel ...	Ship
KINK	Lake Glasco ...	Ship	KISR	City of Fairbury	Ship
KINL	Pere Marquette 8	Ship	KISS	Liberty Land ...	Ship
KINM	Lehigh ...	Ship	KIST	William G. Howard ...	Ship
KINN	West Ison ...	Ship	KISV	Asquam ...	Ship
KINP	West Hepburn	Ship	KISX	Lake Farrar ...	Ship
KINQ	Eelbeck ...	Ship	KITB	Lake Falama ...	Ship
KINR	Olen ...	Ship	KITC	Babboosic ...	Ship
KINS	Boston Bridge	Ship	KITF	Firthcliffe ...	Ship
KINT	Bay Head ...	Ship	KITG	Kittegaun ...	Ship
KINV	Calno ...	Ship	KITJ	Innoko ...	Ship
KINX	Davidson County	Ship	KITK	Bellbuckle ...	Ship
KINZ	Pawtucket ...	Ship	KITL	Wytheville ...	Ship
KIPB	Assinippi ...	Ship	KITM	Betsy Bell ...	Ship
KIPC	Pontia ...	Ship	KITN	Nameaug ...	Ship
KIPD	Wallkill ...	Ship	KITP	Lake Gadsden	Ship
KIPF	Woodmansie ...	Ship	KITQ	Lake Singara ...	Ship
KIPG	Doylestown ...	Ship	KITR	Keshena ...	Ship
KIPI	West Chatala ...	Ship	KITS	Kiokee ...	Ship
KIPK	West Segovia ...	Ship	KITT	Kiron ...	Ship
KIPN	Lake Gazette ...	Ship	KITV	Kitchi ...	Ship
KIPP	American Star	Ship	KITX	Willfaro ...	Ship
KIPQ	Lake Fablus ...	Ship	KITZ	West Inskip ...	Ship
KIPR	S. B. Hunt ...	Ship	KIVB	Minnequa ...	Ship
KIPS	Geo. H. Jones	Ship	KIVC	Kewanee ...	Ship
KIPV	Luxpallie ...	Ship	KIVD	Marina KIVD..	Ship
KIPX	Maiden Creek ...	Ship	KIVF	Lightburne ...	Ship
KIPZ	Lake Farmingdale ...	Ship	KIVG	Mercer Victory	Ship
KIQB	Belfort KIQB	Ship	KIVJ	Hatchie ...	Ship
KIOC	Westmoreland	Ship	KIVK	Traveller KIVK	Ship
KIQD	KIOC ...	Ship	KIVM	Lake Fear ...	Ship
KIQF	Canumset ...	Ship	KIVP	Westiol ...	Ship
KIQG	Cotati ...	Ship	KIVQ	Huguenot ...	Ship
KIQH	Cold Spring ...	Ship	KIVR	Devolente ...	Ship
KIQI	Lake Farragut	Ship	KIVS	Delfina KIVS	Ship
KIQJ	Bolivar ...	Ship	KIVT	Delisle ...	Ship
KIQK	Hugaton ...	Ship	KIVV	West Cactus ...	Ship
KIQL	Bathgate ...	Ship	KIVX	Guardsman ...	Ship
KIQM	Bathalum ...	Ship	KIVZ	Custodian KIVZ	Ship
KIQN	Corson ...	Ship	KIXB	West Cheswald	Ship
KIQO	Floorspar ...	Ship	KIXC	West Raritans	Ship
KIQP	Liberty Glo ...	Ship	KIXD	Lackawanna Valley ...	Ship
KIQR	Lake Farber	Ship	KIXF	Ablanset ...	Ship
KIQS	West Cayote ...	Ship	KIXG	Asabeth ...	Ship
KIQT	New Britain ...	Ship	KIXH	Fourth Alabama	Ship
KIQU	Lake Frumet ...	Ship	KIXI	Lafcom ...	Ship
KIQV	Sharon ...	Ship	KIXJ	Lockport ...	Ship
KIQW	Arenas KIRM...	Ship	KIXK	Lordship Manor	Ship
KIQX	Haddon ...	Ship	KIXL	Nonantum ...	Ship
KIQY	Waco ...	Ship	KIXM	Putnam KIXQ	Ship
KIQZ	Delavan ...	Ship	KIXN	Tulsa KIXR ...	Ship
KIRB	Cambridge	Ship	KIXO	Abraham Lincoln	Ship
KIRC	KIRR ...	Ship	KIXP	Lake Flagon ...	Ship
KIRD	John Ena ...	Ship	KIXQ	Montauk ...	Ship
KIRE	Derby Line ...	Ship	KIXR	Wekika ...	Ship
KIRF	Lake Fairfax ...	Ship	KIXS	West Selene ...	Ship
KIRG	Casper ...	Ship	KIXT	Delco ...	Ship
KIRH	Glen Ridge ...	Ship	KIXU	Bakersfield ...	Ship
KIRI	Orcus ...	Ship	KIXV	De Bardeleben	Ship
KIRJ	Seattle Spirit ...	Ship	KIXW	Buffalo Bridge	Ship
KIRK	Elkridge ...	Ship	KIXX	Parksville ...	Ship
KIRL	Stanley KISJ	Ship	KIXY	Dauperata ...	Ship
KIRM	Wheatland	Ship	KIXZ	Katherine ...	Ship
KIRN	Montana ...	Ship	KIZB	Avalon KIZL	Ship
KIRO	West Keene ...	Ship	KIZC	Lake Flagstaff	Ship
KIRP	Baldbutte ...	Ship	KIZD		
KIRQ			KIZF		
KIRR			KIZG		
			KIZH		
			KIZI		
			KIZJ		
			KIZK		
			KIZL		
			KIZM		

KIZN	Lake Flambeau	Ship	KKT	Cid (El) KKT	Ship
KIZP	Schikshinny ...	Ship	KKU	Mundo (El) ...	Ship
KIZQ	Bannack ...	Ship	KKV	Oriente (El) ...	Ship
KIZR	Winona County	Ship	KKW	Valle (El) ...	Ship
KIZS	Vincent ...	Ship	KKX	Occidente (El)	Ship
KIZT	Algonquin KIZT	Ship	KKY	Dia (El) ...	Ship
KIXV	Imlay ...	Ship	KKZ	Rio (El) ...	Ship
KIZX	Labette ...	Ship	KKAE	Nushagak ...	Alaska
KIZZ	Rockaway Park	Ship	KKAI	Hawk Inlet ...	Alaska
KJA	Jualin ...	Alaska	KKAO	Kussilof ...	Alaska
KJB	Everett ...	U.S.A.	KKAU	Avondale ...	Ship
KJD	North Land KJD	Ship	KKEE	Nanking ...	Ship
KJE	Norlina ...	Ship	KKEI	City of Sydney	Ship
KJF	Carolinian ...	Ship	KKEO	Waukesha ...	Ship
KJH	West Wind ...	Ship	KKEU	Mariners Harbour	Ship
KJI	Satsuma KJI ...	Ship	KKOA	Biran ...	Ship
KJJ	Sunnyvale ...	U.S.A.	KKOE	Lake Annette	Ship
KJK	King Cove ...	Alaska	KKUI	Wm. G. Mather	Ship
KJL	False Pass ...	Alaska	KLA	Pastores ...	Ship
KJM	West Cherow ...	Ship	KLB	Pasadena ...	U.S.A.
KJO	Munisla ...	Ship	KLC	Calamares ...	Ship
KJO	Stockton ...	U.S.A.	KLE	Zacapa ...	Ship
KJR	Seattle ...	U.S.A.	KLF	Metapan ...	Ship
KJS	Los Angeles ...	U.S.A.	KLG	S. Marta ...	Ship
KJT	Waban ...	Ship	KLH	Saramaca ...	Ship
KJU	Bacoi ...	Ship	KLI	Suriname ...	Ship
KJV	West Haven ...	Ship	KLIJ	Beatrice ...	Ship
KJW	O. T. Waring ...	Ship	KLK	Craster Hall ...	Ship
KJX	Westland KJX	Ship	KLL	Thompson Falls	U.S.A.
KJY	West Point ...	Ship	KLM	Bantu ...	Ship
KJZ	Chincha ...	Ship	KLN	Del Monte ...	U.S.A.
KJAA	Chebaulip ...	Ship	KLO	S. Rosalia ...	Ship
KJAE	West Indian ...	Ship	KLP	Los Altos ...	U.S.A.
KJAI	West Durfee ...	Ship	KLQ	Rainbow ...	U.S.A.
KJAO	West Lianga ...	Ship	KLR	Crofton Hall ...	Ship
KJAU	West Grove ...	Ship	KLS	Oakland ...	U.S.A.
KJEA	Western Ocean	Ship	KLT	Howick Hall ...	Ship
KJEI	John M. Connelly	Ship	KLU	Charlton Hall	Ship
KJIE	Walter A Luck-		KLV	S. Mateo KLV	Ship
	enbach ...	Ship	KLW	Port Althorp ...	Alaska
KJII	Muscatine ...	Ship	KLX	Oakland ...	U.S.A.
KJIO	Paul H. Harwood	Ship	KLY	Deepwater ...	Ship
KJIU	Carib KJIU ...	Ship	KLZ	Denver ...	U.S.A.
KJOE	W. M. Irish ...	Ship	KLAA	Luella ...	Ship
KJOO	West Bridge ...	Ship	KLAE	Overbrook ...	Ship
KJOU	Seaconnet ...	Ship	KLAO	Lake Crystal ...	Ship
KJUA	Ice King ...	Ship	KLAU	Lake Winona ...	Ship
KJUE	Radnor ...	Ship	KLEA	Lake Maurepas	Ship
KJUI	Point Lobos ...	Ship	KLEE	Lake St. Regis	Ship
KJUO	West Alsek ...	Ship	KLEI	Lake Allen ...	Ship
KJUJ	West Apaum ...	Ship	KLEO	Lake Clear ...	Ship
KKA	Yakutat ...	Alaska	KLEU	Lake Pewaukee	Ship
KKB	Sol (El) ...	Ship	KLIA	Lake Otisgo ...	Ship
KKC	Chalmette ...	Ship	KLIE	Lake Como ...	Ship
KKD	Comus ...	Ship	KLIU	Lake Sunapee	Ship
KKE	Topila ...	Ship	KLOE	Lake Hemlock	Ship
KKF	Torres ...	Ship	KLOI	Lake Hurst ...	Ship
KKG	Almirante (El)	Ship	KLOO	Lake Lida ...	Ship
KKH	Capitan (El) KKH	Ship	KLOU	Lake Shewano	Ship
KKI	Kilkenny ...	Ship	KLUA	Lake Capens ...	Ship
KKJ	West Celeron ...	Ship	KLUE	Lake Sebago ...	Ship
KKL	Alba (El) KKL	Ship	KLUI	Lake Cayuga ...	Ship
KKM	Momus ...	Ship	KLUO	Lake Ennis ...	Ship
KKN	Norte (El) ...	Ship	KLUU	Agarista ...	Ship
KKO	Excelsior ...	Ship	KMA	Allianca ...	Ship
KKP	Mahanna ...	Ship	KMB	Amolco ...	Ship
KKQ	Sud (El) ...	Ship	KMC	Reedley ...	U.S.A.
KKR	Creole ...	Ship	KMD	Cristobal ...	Ship
KKs	Siglo (El) ...	Ship	KME	Pennant ...	Ship

KMF	Egegik ...	Alaska	KNEE	S. Tecla ...	Ship
KMG	Ekuk ...	Alaska	KNEU	Wishkah ...	Ship
KMH	Panama KMH	Ship	KOA	Denver... ..	U.S.A.
KMI	Tivives.. ..	Ship	KOC	Jamestown ...	Ship
KMJ	Fresno ...	U.S.A.	KOD	Jefferson KOD	Ship
KMK	Naknek ...	Alaska	KOF	Castle Town ...	Ship
KML	Lockanok ...	Alaska	KOG	Los Angeles ...	U.S.A.
KMM	Panuco KMM...	Ship	KOH	Glenpool ...	Ship
KMN	Butte ...	U.S.A.	KOI	Polarine ...	Ship
KMO	Tacoma ...	U.S.A.	KOK	Clearwater ...	U.S.A.
KMP	Metha Nelson	Alaska	KOL	Mount Hope ...	U.S.A.
KMQ	Sherman KMG	Ship	KOP	Detroit... ..	U.S.A.
KMR	Wellington KMR	Ship	KOT	Kanak ...	Ship
KMR	Khartoum ...	Sudan	KOU	Tidewater ...	Ship
KMS	Ancon ...	Ship	KOV	Kwiguk Slough	Alaska
KMT	Libbyville ...	Alaska	KOV	Kovno ...	Lithuania
KMU	Ugashik ...	Alaska	KOW	Mascotte ...	Ship
KMV	Advance ...	Ship	KOX	Henry M. Flagler	Ship
KMW	Akutan ...	Alaska	KOY	Herbert L. Pratt	Ship
KMX	Colon KMX ...	Ship	KOZ	Miami ...	Ship
KMY	Holden Evans...	Ship	KOBC	Ruby ...	Ship
KMZ	General G. W.		KOBD	Orani ...	Ship
	Goethals ...	Ship	KOBF	Vanada ...	Ship
KMAA	Admiral Nichol-		KOBG	Editor ...	Ship
	son ...	Ship	KOBJ	Deroche ...	Ship
KMAI	Catherine D. ...	Ship	KOBK	West Katan ...	Ship
KMEI	Orizara ...	Ship	KOBL	Lake Ellijay ...	Ship
KMEO	Cletus Schneider	Ship	KOBM	Willpolo ...	Ship
KMEU	Pasadena ...	Ship	KOBP	Bird City ...	Ship
KMIE	Cape Henry ...	Ship	KOBQ	Gonzalis ...	Ship
KMII	Masuda ...	Ship	KOBR	Barwick ...	Ship
KMIO	Willimantic ...	Ship	KOBT	Lake Inglenook	Ship
KMIU	W. M. Burton ...	Ship	KOBV	Baldhill ...	Ship
KMOE	Accomac ...	Ship	KOBX	Moshico ...	Ship
KMOI	Eldorado ...	Ship	KOBZ	Lake Elon ...	Ship
KMOO	Oakland ...	Ship	KOCB	Lake Savus ...	Ship
KMOU	Edward Pierce	Ship	KOCC	Epitacio Pessoa	Ship
KMUA	Lake Lasang ...	Ship	KOCD	Texarkana ...	Ship
KMUE	Lake Larga ...	Ship	KOCF	Nokatay ...	Ship
KMUI	George W. Barnes	Ship	KOCG	Lake Fiscus ...	Ship
KMUU	Lake Flume ...	Ship	KOCJ	Aquilo ...	Ship
KNA	Dorothy Brad-		KOCK	West Pocasset	Ship
	ford ...	Ship	KOCL	Elk Horn ...	Ship
KNB	Lexington KNB	Ship	KOCM	Marsodak ...	Ship
KNC	Concord ...	Ship	KOCN	Federal Bridge	Ship
KND	Plymouth ...	Ship	KOCP	Continental Bdge	Ship
KNE	Clare ...	Ship	KOCO	Clark Mills ...	Ship
KNF	Wm. G. Warden	Ship	KOCR	John W. Wells	Ship
KNG	Bradford ...	Ship	KOCS	Lake Girardeau	Ship
KNH	Brockton ...	Ship	KOCT	Hercules KOCT	Ship
KNK	Marica ...	Ship	KOCV	West Saginaw	Ship
KNL	Nelson ...	Ship	KOCX	West Jaffrey ...	Ship
KNM	Millinocket ...	Ship	KOCZ	Lake Ellsworth	Ship
KNO	Trinidadian ...	Ship	KODB	Nobles ...	Ship
KNP	Chignik ...	Alaska	KODC	Sunbeam ...	Ship
KNQ	F. Q. Barstow	Ship	KODD	Lake Fisher ...	Ship
KNS	Sucrosa ...	Ship	KODF	West Caddoa ...	Ship
KNU	Currier ...	Ship	KODG	Siletz ...	Ship
KNW	Robt. M. Thomp-		KODK	Hathaway ...	Ship
	son ...	Ship	KODL	Menominee ...	Ship
KNX	Los Angeles ...	U.S.A.	KODN	Endicotte ...	Ship
KNY	Fred W. Weller	Ship	KODP	Babinda ...	Ship
KNZ	A. C. Bedford	Ship	KODO	Hulaco ...	Ship
KNAA	Western Sea ...	Ship	KODR	Salem County	Ship
KNAE	West Cohass ...	Ship	KODS	Bellemine ...	Ship
KNAI	Western City ...	Ship	KODT	Dewey KODT	Ship
KNAO	Western Chief	Ship	KODX	Dillwyn ...	Ship
KNAU	Westford ...	Ship	KODZ	Ophis ...	Ship
KNEA	Western Spirit	Ship	KOFC	Bellhaven ...	Ship

KOFD	Anaconda ...	Ship	KOLJ	Lake Faxon ...	Ship
KOFF	Auditor ...	Ship	KOLK	Lake Felden ...	Ship
KOFG	Dean Emery ...	Ship	KOLL	Clavarack ...	Ship
KOFJ	H. F. Morse ...	Ship	KOLN	Susquehanna	
KOFK	Elkton ...	Ship	KOLN	KOLN ...	Ship
KOFL	Chepadoa ...	Ship	KOLP	Cathlamet ...	Ship
KOFM	Lake Ellithorpe ...	Ship	KOLR	Lake Elmdale ...	Ship
KOFN	Cockaponset ...	Ship	KOLS	Chicomico ...	Ship
KOFP	Lake Ellsbury ...	Ship	KOLT	Effingham KOLT	Ship
KOFO	Lake Elnhurst ...	Ship	KOIV	Pallsades ...	Ship
KOFR	Basford ...	Ship	KOLX	Cranford KOLX	Ship
KOFS	Bascobel ...	Ship	KOLZ	Lake Getaway ...	Ship
KPFT	Bensalem ...	Ship	KOMB	Lake Gert ...	Ship
KOFV	Lake Elpueblo ...	Ship	KOMC	Lake Flattery ...	Ship
KOFX	Cook KOFX ...	Ship	KOMD	Deuel ...	Ship
KOFZ	Coquitt ...	Ship	KOMF	Bartholomew ...	Ship
KOGB	Independent		KOMG	Whitemarsh ...	Ship
	Bridge ...	Ship	KOMK	Lycoming ...	Ship
KOGC	Lackawanna		KOML	J. R. Gordon ...	Ship
	Bridge ...	Ship	KOMM	Scottsburg ...	Ship
KOGD	Moose Hausic ...	Ship	KOMN	S. Antonio	
KOGF	Kootenai ...	Ship	KOMN	KOMN ...	Ship
KOGJ	Nockum ...	Ship	KOMP	Soahoma County	Ship
KOGL	West Ira ...	Ship	KOMQ	Afoundria ...	Ship
KOGM	Storm King		KOMR	Ashland County	Ship
	KOGM ...	Ship	KOMS	Henry County	Ship
KOGN	Brave Coeur ...	Ship	KOMT	Efina ...	Ship
KOGP	Hadnot ...	Ship	KOMV	Montague ...	Ship
KOGQ	Irvington ...	Ship	KOMX	Peekskill ...	Ship
KOGR	Lake Fairport ...	Ship	KOMZ	Coskata ...	Ship
KOGS	Lake Flatonia... ..	Ship	KONB	Cushnet ...	Ship
KOGT	Lake Flanders ...	Ship	KONC	Cutthunk ...	Ship
KOGV	Lake Gebhart ...	Ship	KOND	Indiana Bridge	Ship
KOGX	Merry Mount ...	Ship	KONG	Margus... ..	Ship
KOGZ	Commissioner		KONJ	Massillon Bridge	Ship
KOJB	York Harbor ...	Ship	KONK	Northwestern	
KOJD	Sinsinawa ...	Ship		Bridge ...	Ship
KOJF	Montana ...	Ship	KONL	Fargo ...	Ship
KOJG	Jacksonville ...	Ship	KONN	Sioux Falls ...	Ship
KOJJ	Lake Galata ...	Ship	KONN	Crosse (La) ...	Ship
KOJJ	Nipsic ...	Ship	KONP	Lansdowne ...	Ship
KOJK	Hanover ...	Ship	KONO	Andrew Jackson	Ship
KOJL	Cripple Creek ...	Ship	KONR	Antietam ...	Ship
KOJM	Lake Onawa ...	Ship	KONS	Lake Strymon	Ship
KOJP	Lake Favonia ...	Ship	KONT	Lake Elsmere	Ship
KOJQ	Lake Fitch ...	Ship	KONV	Lake Filbert ...	Ship
KOJR	Chickasaw ...	Ship	KONX	Detroit-Wayne	Ship
KOJS	Magmeric ...	Ship	KONZ	City of Alton ...	Ship
KOJT	Lake Galien ...	Ship	KOPB	Lake Fernalda	Ship
KOJV	Portsmouth ...	Ship	KOPC	Bavington ...	Ship
KOJX	Lake Galewood ...	Ship	KOPD	Dannedaika ...	Ship
KOJZ	Lake Gaither ...	Ship	KOPF	Massick ...	Ship
KOKC	Northern Star... ..	Ship	KOPG	Minnewawa ...	Ship
KOKD	Bellerose ...	Ship	KOPJ	Terre Haute ...	Ship
KOKF	Bellepline ...	Ship	KOPK	Circinus ...	Ship
KOKG	Moosit Auka ...	Ship	KOPL	Corvus ...	Ship
KOKK	Iceland ...	Ship	KOPM	Nika ...	Ship
KOKM	Daniel Webster	Ship	KOPN	Wasagya ...	Ship
KOKN	Potomac KOKN	Ship	KOPP	Eastern Breeze	Ship
KOKP	Crisfield ...	Ship	KOPQ	Bellflower ...	Ship
KOKQ	Paria ...	Ship	KOPR	Kearny ...	Ship
KOKR	Inspector ...	Ship	KOPS	Coolcha ...	Ship
KOKS	Lake Gera ...	Ship	KOPT	Eglantine KOPT	Ship
KOKT	Irene KOKT ...	Ship	KOPV	Lake Fillion ...	Ship
KOKV	Kaleen ...	Ship	KOPZ	Centaurus ...	Ship
KOKX	Kolda ...	Ship	KOPB	Clauseus ...	Ship
KOKZ	Lake Fithlan ...	Ship	KOQC	Hagan ...	Ship
KOLB	Aryan ..	Ship	KOQD	Hagood ...	Ship
KOLC	Orient KOLC ...	Ship	KOQF	Tri Mountain ...	Ship

KOQG	Lake Elmont ...	Ship	KOVT	Coeur D'Alene ...	Ship
KOQJ	Casey ...	Ship	KOVV	Coelleda ...	Ship
KOQK	Coldbrook ...	Ship	KOVX	Tampa KOVX	Ship
KOQL	George C. Greer	Ship	KOVZ	I. J. Merritt ...	Ship
KOQM	Standtug No. 1	Ship	KOXB	Haslehurst ...	Ship
KOQN	Standard ...	Ship	KOXC	Suwied ...	Ship
KOQP	McCreary County	Ship	KOXD	Tashmoo ...	Ship
KOQQ	West Ivis ...	Ship	KOXF	Teko KOXF	Ship
KOQS	Kayseeka ...	Ship	KOXG	Toledo Bridge	Ship
KOQT	Egremont ...	Ship	KOXJ	Tona ...	Ship
KOQU	Quinnipiac ...	Ship	KOXX	Tonesit ...	Ship
KOQV	Caldas ...	Ship	KOXL	Tuladi ...	Ship
KOQX	Nipmuc ...	Ship	KOXM	Vincennes Bridge	Ship
KORB	West Mingo ...	Ship	KOXN	Pirate Cove ...	Ala-ka
KORC	Elizabeth ...	Ship	KOXP	Von Steuben ...	Ship
KORD	Sundance ...	Ship	KOXR	Tampico ...	Ship
KORF	Noccalula ...	Ship	KOXS	West Jessup ...	Ship
KORG	Cethana ...	Ship	KOXT	Robin Gray ...	Ship
KORJ	Challamba ...	Ship	KOXV	Roanoke KOXV	Ship
KORK	Dryden KORK	Ship	KOXX	Steelmaker ...	Ship
KORL	Haleakala ...	Ship	KONZ	Steel Age ...	Ship
KORM	Jadden... ..	Ship	KOZB	City of Omaha	Ship
KORP	Monomac ...	Ship	KOZC	C. of Los Angeles	Ship
KORQ	Bogota KORQ	Ship	KOZD	Rockport ...	Ship
KORS	Manham ...	Ship	KOZF	Tenally ...	Ship
KORT	Hancock County	Ship	KOZG	Moravia Bridge	Ship
KORV	Wildwood ...	Ship	KOZJ	West Niger ...	Ship
KORX	Cliffwood ...	Ship	KOZK	West Hika ...	Ship
KOSD	Nile KOSD	Ship	KOZL	Quaker City ...	Ship
KOSF	Monroe ...	Ship	KOZM	Miskianza ...	Ship
KOSL	West Kader ...	Ship	KOZN	Minooka ...	Ship
KOSM	City of St. Joseph	Ship	KOZP	Vigilant ...	Ship
KOSN	John Roach ...	Ship	KOZQ	City of Berkeley	Ship
KOSO	Lake Treba ...	Ship	KOZR	Culburra ...	Ship
KOSR	Lake Elsay ...	Ship	KOZS	West Ivan ...	Ship
KOSS	John Adams ...	Ship	KOZT	Lake Elmwood	Ship
KOST	Danville ...	Ship	KOZV	Wm. H. Webb	Ship
KOST	Chester Valley	Ship	KOZX	Norumbega ...	Ship
KOSV	Kenowis ...	Ship	KOZZ	Collamer ...	Ship
KOSX	Hartford KOSX	Ship	KPB	Amuguis ...	Philippine Islands
KOTB	Lake Falun ...	Ship	KPC	Batangas ...	Philippine Islands
KOTD	Cross Keys ...	Ship	KPD	W. H. Tilford...	Ship
KOTF	Mitchell ...	Ship	KPE	Seattle ...	U.S.A.
KOTG	West Jena ...	Ship	KPF	General O. H. Ernst ...	Ship
KOTJ	Lake Slavi ...	Ship	KPG	General H. F. Hodges ...	Ship
KOTK	West Neris ...	Ship	KPH	Bolinas ...	U.S.A.
KOTL	Vinita ...	Ship	KPI	Cebu ...	Philippine Islands
KOTM	Robin Hood ...	Ship	KPJ	Culion ...	Philippine Islands
KOTN	West Hesseltine	Ship	KPL	Moonlite ...	Ship
KOTP	Wisla ...	Ship	KPM	Eureka... ..	U.S.A.
KOTQ	Red Mountain	Ship	KPM	Iloilo ...	Philippine Islands
KOTR	West Montop ...	Ship	KPN	Isabela de Basilan	Philippine Islands
KOTT	Lake Fenn ...	Ship	KPP	Dawnlite ...	Ship
KOTV	Franklin County	Ship	KPQ	Sunlite ...	Ship
KOTX	Delanson ...	Ship	KPR	Daylite ...	Ship
KOTZ	Benowa ...	Ship	KPS	Benjamin Brew- ster ...	Ship
KOVB	Gulf Trade ...	Ship	KPT	Achilles KPT ...	Ship
KOVC	Lake Tippah ...	Ship	KPU	Ulysses KPU ...	Ship
KOVD	Maquan ...	Ship	KPV	Malangas ...	Philippine Islands
KOVF	Amcross ...	Ship			
KOVG	Lake Elmsford	Ship			
KOVJ	Dilworth ...	Ship			
KOVL	Lake Pandango	Ship			
KOVM	Robin Adair ...	Ship			
KOVN	E. A. Morse ...	Ship			
KOVP	Georgian ...	Ship			
KOVQ	Elfay ...	Ship			
KOVR	Abercos ...	Ship			
KOVS	Lake Fandon ...	Ship			

KPW	Malita ...	Philippine Islands	KRV	Governor Dingley	Ship
KPX	Lebak ...	Philippine Islands	KRW	Sierra ...	Ship
KPY	San Francisco	Philippine Islands	KRX	Chichagof ...	Alaska
KPZ	Mati ...	Philippine Islands	KRZ	Sudbury KRZ	Ship
KPAA	Point Judith ...	Ship	KRAA	West Coast ...	Ship
KQA	Harry Farnum ...	Ship	KRAE	Mauban ...	Ship
KQB	W. L. Connelly ...	Ship	KREA	Cape Romain ...	Ship
KQC	Cretan ...	Ship	KREE	Gulfport ...	Ship
KQD	Dorchester ...	Ship	KREI	Lake Washburn	Ship
KQF	Gene Crawley ...	Ship	KREO	Lake Mary ...	Ship
KQG	Gloucester ...	Ship	KRIA	Lake Daraga ...	Ship
KQH	Howard KQH...	Ship	KRII	Lake Elsinore	Ship
KQI	Berkeley ...	U.S.A.	KRIU	Liberator KRIU	Ship
KQJ	Junjata KQJ ...	Ship	KROE	Aniwa ...	Ship
KQK	Kershaw ...	Ship	KROI	Wampum ...	Ship
KQM	Merrimack ...	Ship	KROO	Wassaic ...	Ship
KQN	Nantucket ...	Ship	KROU	Garibaldi KROU	Ship
KQP	Hood River ...	U.S.A.	KRUI	S. Flavia ...	Ship
KQQ	Quantic ...	Ship	KRUO	Wakulla ...	Ship
KQR	Grecian ...	Ship	KRUU	Socony 88 ...	Ship
KQR	Washington Bay	Alaska	KSA	Standard II. ...	Ship
KQT	Yakima ...	U.S.A.	KSB	J. E. O'Neil ...	Ship
KQU	Ruth E. Merrill	Ship	KSD	St. Louis ...	U.S.A.
KQV	Pittsburg ...	U.S.A.	KSF	Finland ...	Ship
KQW	S. Jose ...	U.S.A.	KSG	Baton Rouge	Ship
KQX	Persian ...	Ship	KSH	KSG ...	Ship
KQY	Portland ...	U.S.A.	KSI	Kroonland ...	Ship
KQZ	City of Rome ...	Ship	KSJ	H. H. Rogers ...	Ship
KQEO	Lake Charlotte	Ship	KSK	Security ...	Ship
KQIE	Farnam ...	Ship	KSL	Caddo ...	Ship
KQII	S. Olivia ...	Ship	KSM	San Francisco	U.S.A.
KQIO	Deranof ...	Ship	KSN	Philadelphia ...	Ship
KQIU	West Ekonk ...	Ship	KSO	New York ...	Ship
KQOE	Delight ...	Ship	KSP	S. Paul KSO ...	Ship
KQOI	Western Light	Ship	KSQ	Caloria ...	Ship
KQOO	Western Maid	Ship	KSR	Charles Pratt...	Ship
KQUA	Allies ...	Ship	KST	Bayway ...	Ship
KQUE	Lancaster ...	Ship	KSU	Princeton ...	Ship
KQOU	Lake Chelan ...	Ship	KSV	Somerset KSU	Ship
KQUU	West Gambo ...	Ship	KSW	Standard Arrow	Ship
KRA	Freeport Sulphur	Ship	KSX	Royal Arrow ...	Ship
KRB	No. 1 ...	Ship	KSY	Sylvan Arrow	Ship
KRC	Governor Cobb	Ship	KSZ	Broad Arrow ...	Ship
KRD	Camden KRC	Ship	KSAO	Cora F. Cressy	Ship
KRE	Belfast ...	Ship	KSEA	Socony 89 ...	Ship
KRF	Berkeley ...	U.S.A.	KSEE	Lake Conesus ...	Ship
KRG	Ransom B. Fuller	Ship	KSEI	Absecon ...	Ship
KRH	Freeport Sulphur	Ship	KSEU	Mineola ...	Ship
KRI	No. 2 ...	Ship	KSIE	Eastern Chief ...	Ship
KRI	City of Bangor	Ship	KSIU	Jonancy ...	Ship
KRI	City of Rockland	Ship	KSOA	Glen White ...	Ship
KRJ	Relief ...	Ship	KSOE	Lake Catherine	Ship
KRK	Oswego ...	Ship	KSOI	Lake Benton ...	Ship
KRL	Kiowa KRL ...	Ship	KSOO	Polar Sea ...	Ship
KRM	Resolute KRM	Ship	KSOU	Lake Eckhart	Ship
KRN	Calvin Austin	Ship	KSUA	Lake Wimico ...	Ship
KRO	Bramell Point	Ship	KTB	Lake Duncan ...	Ship
KRP	Port Townsend	U.S.A.	KTC	Bylail ...	Ship
KRQ	Manitowoc ...	Ship	KTD	F. D. Asche' ...	Ship
KRR	C. A. Snider ...	Ship	KTE	Gulfstream ...	Ship
KRS	Paulsboro ...	Ship	KTF	Shenango ...	Ship
KRT	S. Francisco	Ship	KTG	Ligonier, ...	Ship
KRU	KRT ...	Ship	KTH	Winifred ...	Ship
	Forndonian ...	Ship	KTI	J. M. Guffrey ...	Ship
			KTI	Gulfoil... ..	Ship
			KTK	Robert P. Clark.	Ship
				Brilliant ...	Ship
				Comet	Ship
				Akutan	Alaska

KTL	Rayo ...	Ship	KUBN	Robin Good-	Ship
KTM	Eocene ...	Ship	KUBP	fellow	Ship
KTN	Perfection ...	Ship	KUBR	City of Alma ...	Ship
KTO	John D. Rocke-	Ship	KUBR	Lake Elva ...	Ship
	feller ...	Ship	KUBS	Indiana Harbor	Ship
KTP	James McGee	Ship	KUBT	Lake Feodora	Ship
KTO	City of Everett	Ship	KUBV	Higbo ...	Ship
KTR	Radiant ...	Ship	KUBX	Koggiung ...	Alaska
KTS	Vesta KTS ...	Ship	KUCB	New England	Ship
TTT	Paraguay ...	Ship	KUCC	Plow City ...	Ship
KTU	Sun ...	Ship	KUCD	Riverside Bridge	Ship
KTV	Dulcino ...	Ship	KUCF	Virginia Bridge	Ship
KTX	Socony ...	Ship	KUCG	Des Moines Bidge.	Ship
KTY	W. C. Teagle ...	Ship	KUCJ	Holyoke Bridge	Ship
KTZ	Brindilla ...	Ship	KUCK	Wauwatosa ...	Ship
KTAA	Alloway ...	Ship	KUCM	Lake Ikatan ...	Ship
KTAI	Lake Eliko ...	Ship	KUCN	Eastern Guide	Ship
KTAO	Lake Frances ...	Ship	KUCP	Chisik Is. ...	Alaska
KTAU	Eastern Star ...	Ship	KUCQ	City of Almeda	Ship
KTEA	Eastern Sea ...	Ship	KUCR	Lake Giddings	Ship
KTEE	Western Cross	Ship	KUCS	City of Sherman	Ship
KTEI	Winnebago	Ship	KUCV	City of Flint ...	Ship
	KTEI ...	Ship	KUCX	Cold Water ...	Ship
KTIE	Eastern Sun ...	Ship	KUCZ	Bridgetown ...	Ship
KTIO	Fresno ...	Ship	KUDC	Tuscan KUDC	Ship
KTIU	Lake Blanchester	Ship	KUDD	Argon ...	Ship
KTOA	Lake Narka ...	Ship	KUDG	West Jester ...	Ship
KTOE	Mary KTOE ...	Ship	KUDK	West Cadron ...	Ship
KTOI	Catherine ...	Ship	KUDL	Willsolo ...	Ship
KTOO	Lake Yemassee	Ship	KUDM	Lake Elwin ...	Ship
KTOU	Lake Markham	Ship	KUDN	American Press	Ship
KTUA	Lake Ledan ...	Ship	KUDP	Clontarf ...	Ship
KTUE	Lake Bledsoe ...	Ship	KUDQ	West Himrod	Ship
KTUI	Lake Pepin ...	Ship	KUDR	Davenport ...	Ship
KTUO	Sagadahoc ...	Ship	KUDS	Rushville ...	Ship
KTUU	Lake Pachuta	Ship	KUDT	Pilot Point ...	Alaska
KUA	Gulflight ...	Ship	KUDV	Becharof ...	Alaska
KUB	Gulfmaid ...	Ship	KUDX	Eastern Moon	Ship
KUC	Gulf of Mexico	Ship	KUDZ	Eastern Gale ..	Ship
KUD	Gulfland ...	Ship	KUFB	Eastern Knight	Ship
KUE	Gulfcoast ...	Ship	KUFC	Lake Floravista	Ship
KUF	Mundelta ...	Ship	KUFD	Lake Florian ...	Ship
KUG	Munplace ...	Ship	KUFF	Lake Floris ...	Ship
KUI	Munamar ...	Ship	KUFG	Lake Flournoy	Ship
KUJ	Mundale ...	Ship	KUFJ	West Nilus ...	Ship
KUK	Munsomo ...	Ship	KUFK	Haiti KUFK ...	Ship
KUL	Louisiana KUL	Ship	KUFN	Steel Voyager	Ship
KUM	Texas KUM ...	Ship	KUFR	West Campgaw	Ship
KUN	Neptune KUN	Ship	KUFZ	Ossa ...	Ship
KUO	San Francisco	U.S.A.	KUGB	Eastern Mariner	Ship
KUP	Pennsylvania	Ship	KUGC	Boobyalla ...	Ship
	KUP ...	Ship	KUGD	Crudoil ...	Ship
KUQ	Maine KUQ ...	Ship	KUGD	Clearwater ...	Ship
KUR	Georgia KUR	Ship	KUGG	Clemence C.	Ship
KUT	Pan-American	Ship		Morse	
KUU	Brabant KUU	Ship	KUGK	Sioux City ...	Ship
KUV	Virginia KUV	Ship	KUGL	Lake Galisteo ...	Ship
KUW	New York	Ship	KUGM	Ripon ...	Ship
	KUW ...	Ship	KUGN	Lake Haresti ...	Ship
KUX	Munabro ...	Ship	KUGP	Seminole KUGP	Ship
KUZ	Coastwise ...	Ship	KUGQ	Star of Holland	Ship
KUBB	Cold Harbour	Ship	KUGR	Summer Leaf ...	Ship
KUBD	Claremont ...	Ship	KUGS	Blue Triangle ...	Ship
KUBF	S. Diego ...	Ship	KUGT	Jomar ...	Ship
KUBG	Betterton ...	Ship	KUGV	Willhilo ...	Ship
KUBJ	Liberty Minquas	Ship	KUGX	Mason City ...	Ship
KUBK	Bearport ...	Ship	KUGZ	Lillian ...	Ship
KUBL	Pawlet ...	Ship	KUJB	Angeles (The)	Ship
KUBM	S. Anthony ...	Ship		KUJB ...	Ship

KUJC	Bayport ...	Ship	KUNS	City of Vernon	Ship
KUJF	Kerhonkson ...	Ship	KUNT	George B.	
KUJK	Havilah ...	Ship		Mackenzie ...	Ship
KUJP	Hutchinson ...	Ship	KUNV	Winona KUNV	Ship
KUJR	City of Joliet ...	Ship	KUNZ	Chickasaw City	Ship
KUJS	Winston-Salem ...	Ship	KUOG	Padnsay ...	Ship
KUJT	Eastern Belle ...	Ship	KUPB	Italia KUPB ...	Ship
KUJV	Eastern Crag ...	Ship	KUPD	Eastern Planet	Ship
KUJX	Liberty Bell ...	Ship	KUPF	Hahatonka ...	Ship
KUJZ	Quabbin ...	Ship	KUPG	Greenland ...	Ship
KUKD	East Chicago ...	Ship	KUPJ	West Cahokia ...	Ship
KUKG	Anthracite Bdge.	Ship	KUPK	Darden ...	Ship
KUKJ	West Jappa ...	Ship	KUPL	Conness Peak ...	Ship
KUKK	Noddle Island...	Ship	KUPM	Patrick Henry	Ship
KUKL	Pittsburgh Bdge.	Ship	KUPN	Capillo ...	Ship
KUKM	Tancarville ...	Ship	KUPP	Cubore ...	Ship
KUKN	Louise ...	Ship	KUPS	Naugus ...	Ship
KUKP	Mohinkis ...	Ship	KUPT	Waterbury ...	Ship
KUKR	Latham ...	Ship	KUPV	Kehuku ...	Ship
KUKS	Robert		KUPX	Hawarden ...	Ship
	Luckenbach	Ship	KUQB	Fueloil ...	Ship
KUKT	Conejos ...	Ship	KUQC	Panoil ...	Ship
KUKV	West Hixton ...	Ship	KUQF	Martha	
KUKX	Collingsworth...	Ship		Washington..	Ship
KULB	Pinellas ...	Ship	KUQJ	West Nivaria ...	Ship
KULC	Chickamauga ...	Ship	KUQK	West Keats ...	Ship
KULD	Lake Geyser ...	Ship	KUQL	Martinique	
KULF	Fishkill ...	Ship		KUQL	Ship
KULG	Darien ...	Ship	KUQL	Pulwico ...	Ship
KULJ	Eastern Pilot ...	Ship	KUQM	Vegas (Las) ...	Ship
KULK	Otho ...	Ship	KUQN	J. F. Penrose ...	Ship
KULK	Eastern Trader	Ship	KUQP	Unicoi ...	Ship
KULL	Donald McKay	Ship	KUQQ	Conehatta ...	Ship
KULM	Ario ...	Ship	KUQR	Everett KUQR	Ship
KULN	Aripa ...	Ship	KUQS	Margaret KUQS	Ship
KULP	Toopi ...	Ship	KUQT	Eastern Dawn	Ship
KULS	Outagamie ...	Ship	KUQX	Juigny ...	Ship
KULT	Commack ...	Ship	KUQZ	Montfaucon ...	Ship
KULV	S. Juan KULV	Ship	KURB	Hinckley ...	Ship
KULZ	Lydonia ...	Ship	KURC	Cathwood ...	Ship
KUMB	Lake Ganado ...	Ship	KURD	Arcturus KURD	Ship
KUMC	Utacarbon ...	Ship	KURF	Chappaqua ...	Ship
KUMF	Dunsyre ...	Ship	KURG	Artigas... ..	Ship
KUMG	Homer ...	Ship	KURJ	J. L. Reiss ...	Ship
KUMK	Freeport Sulphur		KURL	John R. Gibbons	Ship
	No. 5 ...	Ship	KURM	Eastern Admiral	Ship
KUML	Oklahoma City	Ship	KURN	Manatee ...	Ship
KUMM	West Celera ...	Ship	KURP	Salaam... ..	Ship
KUMN	Portola Plumas	Ship	KURR	Henry Steers ...	Ship
KUMR	Colthraps ...	Ship	KURS	Pilgrim KURS	Ship
KUMS	Atlantic Sun ...	Ship	KURT	Brookline ...	Ship
KUMT	Solitaire ...	Ship	KURV	Ohonkara ...	Ship
KUMV	Lake Glaucus ...	Ship	KURX	Eastern Coast	Ship
KUMX	Lake Flag ...	Ship	KURZ	Suboatco ...	Ship
KUMZ	Lake Hector ...	Ship	KUSB	Suedco ...	Ship
KUNB	Lake Harminia	Ship	KUSC	Sunelseco ...	Ship
KUNC	Lake Gunni. ...	Ship	KUSD	City of Honolulu	Ship
KUND	Eastern Glade	Ship	KUSF	Capital of	
KUNF	George Allen ...	Ship		Nebraska ...	Ship
KUNG	Union Liberty	Ship	KUSG	West Nomentum	Ship
KUNI	Evergreen City	Ship	KUSJ	Occidental ...	Ship
KUNK	Neshobee ...	Ship	KUSK	City of Reno ...	Ship
KUNL	Oronoke ...	Ship	KUSM	John F. Hylan	Ship
KUNM	Wheeling Mold	Ship	KUSN	Aquarius ...	Ship
KUNN	Jennie R. Morse	Ship	KUSP	Crown City ...	Ship
KUNP	Freeport Sulphur		KUSQ	James B Duke	Ship
	No. 6 ...	Ship	KUSR	Nemaha ...	Ship
KUNQ	Eastern Crown	Ship	KUSS	Pioneer KUSS	Ship
KUNR	Eastern Victor	Ship	KUST	West Camak ...	Ship

KUSX	Baccarat KUSX	Ship	KVD	Munrio	...	Ship
KUSZ	Adria KUSZ	...	KVE	Munindies	...	Ship
KUTB	Haxtum	Ship	KVF	Iroquois KVF	...	Ship
KUTC	West Mahwah	Ship	KVG	Chestnut Hill	...	Ship
KUTD	Anna E. Morse	Ship	KVH	Huron KVH	...	Ship
KUTF	Eastern Maid	...	KVI	Unga	...	Alaska
KUTG	Delrosa	Ship	KVJ	Walter D.	...	
KUTJ	Pallas KUTJ	Ship		Munson	...	Ship
KUTK	City of Lords- burg	...	KVK	Cherokee	...	Ship
	John P. Reiss	Ship	KVL	Lenape	...	Ship
KUTM	Canco	...	KVM	Mohawk	...	Ship
KUTP	Iroquois KUTQ	Ship	KVN	Tanamo	...	Ship
KUTQ	Springfield	...	KVO	Sagua	...	Ship
KUTR	Vacuum	...	KVO	Sacramento	...	U.S.A.
KUTS	Birmingham City	Ship	KVR	Elinor	...	Ship
KUTT	Lake Furnas	...	KVS	Gulf Queen	...	Ship
KUTV	Richconcal	...	KVT	Los Angeles	...	U.S.A.
KUTX	Eastern Glen	Ship	KVU	S. Diego	...	U.S.A.
KUVB	City of Weather- ford	...	KVV	Kogglung	...	Alaska
KUVC	Argus KUVD	Ship	KVW	Seattle	...	U.S.A.
KUVD	Sebonac	...	KVX	Allaguash	...	Ship
KUVF	Eastern Tempest	Ship	KVY	William Isom	...	Ship
KUVG	Agron	...	KVZ	Relay	...	Ship
KUVJ	Steel Mariner	...	KVAA	Lake Osweya	...	Ship
KUVK	Steel Trader	...	KVAE	Lake Renbow	...	Ship
KUVL	Hastnai	...	KVAI	Socony 82	...	Ship
KUVP	Johnswood	...	KVAO	Socony 83	...	Ship
KUVQ	Jordan	...	KVEI	West Galoc	...	Ship
KUVR	New York	...	KVII	Montclair	...	Ship
KUVS	Jolee	...	KVIO	Lake Pearl	...	Ship
KUVT	Cardonia	...	KVIU	Allentown	...	Ship
KUVV	Half Moon	...	KVOE	Lake Garza	...	Ship
KUVX	KUVX	...	KVOI	Lake Gaspar	...	Ship
	West Holbrook	Ship	KVOO	Lake Yelverton	...	Ship
KUXB	S Pasqual	...	KVOU	Lake Gakona	...	Ship
KUXC	Cuyamaca	...	KVUA	Lake Ormoc	...	Ship
KUXD	Loretta	...	KVUE	Lake Akkra	...	Ship
KUXF	Cheboygan	...	KVUO	Lake Gedney	...	Ship
KUXM	Miles City	...	KVUU	Lake Hewes	...	Ship
KUXN	Dallas	...	KWA	Mount Vernon Bridge	...	Ship
KUXP	Wichita Falls	...	KWB	Fort Pitt Bridge	...	Ship
KUXQ	John Jay	...	KWC	Morro Castle	...	Ship
KUXR	Long Beach	...	KWD	Antilla	...	Ship
KUXT	Pedrocitas	...	KWE	Santiago KWE	...	Ship
KUXV	Honnedaga	...	KWF	Cauto	...	Ship
KUXZ	Cristina KUZB	Ship	KWG	Stockton	...	U.S.A.
KUZB	Hahira	...	KWH	Los Angeles	...	U.S.A.
KUZC	Jim Sid	...	KWI	Camaguey	...	Ship
KUZD	Suholco	...	KWJ	Yucca	...	Ship
KUZF	Sutransco	...	KWK	W. B. Keene	...	Ship
KUZG	Suelco	...	KWL	Yadkin	...	Ship
KUZJ	Suportco	...	KWM	Panuco KWM	...	Ship
KUZK	Anahuac	...	KWN	Guantanamo	...	Ship
KUZL	Quillwark	...	KWO	Port Beauchaire	...	Alaska
KUZM	Fansa	...	KWP	Sunoi	...	Ship
KUZN	Hayden	...	KWQ	Saltchuck	...	Alaska
KUZP	Salina KUZQ	Ship	KWR	Port Moller	...	Alaska
KUZQ	Capulin	...	KWS	Lost Harbour	...	Alaska
KUZR	Ensley City	...	KWT	Palo Alto	...	U.S.A.
KUZS	Eastern Sailor	Ship	KWU	Katrina Lucken- bach	...	Ship
KUZT	Dungannon	...		Sacramento	...	
KUZV	Carib KUZX	Ship	KWV	KWV	...	Ship
KUZX	Cayo Mambi	...	KWW	Radioville	...	Alaska
KUZZ	Apache KVA	Ship	KWX	Mexico	...	Ship
KVA	Arapahoe	...	KWY	Monterey	...	Ship
KVB	Commanche	...	KXA	Boston KXA	...	Ship
KVC	KVC	...	KXB	City of Lowell	...	Ship

KXC	Commonwealth		KYZ	Thorobred ...	Ship
KXD	KXC ...	Ship	KZA	Alberta KZA ...	Ship
KXE	Firmore ...	Ship	KZB	Alicia ...	Ship
KXF	Mohawk ...	Ship	KZD	Cornelia ...	Ship
	New Hampshire		KZF	Edith ...	Ship
	KXF ...	Ship	KZG	Carolyn ...	Ship
KXG	Archer ...	Ship	KZH	Helen ...	Ship
KXH	Plymouth KXH	Ship	KZJ	Jean KZJ ...	Ship
KXI	Priscilla ...	Ship	KZK	Hilton ...	Ship
KXJ	Providence ...	Ship	KZL	Halcyon ...	Ship
KXK	C.1 ...	Ship	KZM	Oakland ...	U.S.A.
KXL	City of Taunton	Ship	KZO	Margaret KZO	Ship
KXM	Mohegan ...	Ship	KZO	Ruth KZO ...	Ship
KXN	New Haven KXN	Ship	KZR	Remlik III ...	Ship
KXO	City of Brockton	Ship	KZT	Everett KZT ...	Ship
KXP	Pequonnock ...	Ship	KZU	United States	
KXQ	Chester W.			KZU ...	Ship
	Chapin ...	Ship	KZV	Wenatchee ...	U.S.A.
KXR	Richard Peck ...	Ship	KZW	Melrose ...	Ship
KXT	Nebraskan ...	Ship	KZX	Newton KZX ...	Ship
KXU	Westfield ...	Ship	KZY	Oakland ...	U.S.A.
KXV	Nelson Lagoon	Alaska	KZAA	Middlebury ...	Ship
KXW	Ikatan ...	Alaska	KZAE	Lake Linden ...	Ship
KXX	Stephen R. Jones	Ship	KZAI	Lake Winthrop	Ship
KXY	Lewis K. Thurlow	Ship	KZAO	Lake Wilson ...	Ship
KXAA	Lake Alvadh ...	Ship	KZAU	Lake Yahara ...	Ship
KXAE	Lake Delancey	Ship	KZEA	Keketicicut ...	Ship
KXAI	Lake Galera ...	Ship	KZEE	Lake Berdan ...	Ship
KXAO	Lake Otsquago	Ship	KZEI	Lake Dymmer ...	Ship
KXAU	Lake Harris ...	Ship	KZEO	Lake Dancy ...	Ship
KXEA	Lake Pleasant	Ship	KZEU	Lake Agumak ...	Ship
KXED	Lake Gardner	Ship	KZIA	Lake Aurice ...	Ship
KXEE	Lake Marion ...	Ship	KZIE	Lake Winooski	Ship
KXEI	Lake Sanford ...	Ship	KZII	Lake Belnona	Ship
KXEU	Lakeville ...	Ship	KZIO	Lake Lilicusun	Ship
KXIE	Calaveras ...	Ship	KZIU	Sagaporack ...	Ship
KXII	Calicorock ...	Ship	KZOA	Lake Medford	Ship
KXIO	Callspell ...	Ship	KZOE	Lake Arline ...	Ship
KXIU	Lake Calistago	Ship	KZOI	Lake Helen ...	Ship
KXOA	Star of Lapland	Ship	KZOO	Lake Indian ...	Ship
KXOE	Severance ...	Ship	KZOU	Lake Orange ...	Ship
KXOI	Standard KXOI	Ship	KZUE	Kosciuszko ...	Ship
KXOU	Lake Lesa ...	Ship	KZUU	Lake Louise ...	Ship
KXUA	Lake Geneva ...	Ship	LI	Lindenburg ...	Germany
KXUE	Eastern Queen	Ship	LP	Königswuster-	
KXUI	Lake Lillian ...	Ship		hausen ...	Germany
KYA	Kanawha KYA	Ship	LP	Berlin ...	Germany
KYB	North Wind ...	Ship	LY	Bordeaux	France
KYC	Corsair ...	Ship	2 LO	Marconi House	G. B.
KYD	Mount Baker ...	Ship	LAA	Eidsvold ...	Ship
KYE	Casiana ...	Ship	LAB	Harald	
KYG	Portland ...	U.S.A.		Haarfagre ...	Ship
KYH	Aloha ...	Ship	LAC	Norge ...	Ship
KYI	Bakersfield ...	U.S.A.	LAD	Tordenskjold	
KYJ	Los Angeles ...	U.S.A.		LAD ...	Ship
KYK	Karluk ...	Alaska	LAE	Frithjof ...	Ship
KYL	Alitak ...	Alaska	LAF	Viking LAF ...	Ship
KYM	Armenia ...	Ship	LAG	Ellida ...	Ship
KYO	Noma ...	Ship	LAH	Farm ...	Ship
KYP	Oneida KYP ...	Ship	LAI	Draug ...	Ship
KYQ	Honolulu ...	Hawaiian Islands	LAJ	Troll ...	Ship
			LAK	Valkyrien LAK	Ship
KYK	Undaunted KYR	Ship	LAL	Sæl ...	Ship
KYS	Yosemite KYS	Ship	LAN	Hval ...	Ship
KYT	Redondo KYT	Ship	LAO	Trods ...	Ship
KYV	Ascutney ...	Ship	LAP	Lom ...	Ship
KYW	Chicago ...	U.S.A.	LAQ	Jo ...	Ship
KYX	Wana ...	Ship	LAR	Skarv ...	Ship
KYY	S. Francisco ...	U.S.A.	LAS	Teist ...	Ship

LAT	Kjell ...	Ship	LDY	Sverre ...	Ship
LAU	A.1 ...	Ship	LDZ	Borgestad ...	Ship
LAV	A.2 ...	Ship	LEA	Urter ...	Ship
LAW	A.3 ...	Ship	LEB	Jupiter...	Ship
LAX	A.4 ...	Ship	LEC	Send Foyn I ...	Ship
LAY	A.5 ...	Ship	LED	Caloric...	Ship
LAZ	Heimdal LAZ...	Ship	LEE	Maricopa ...	Ship
LBA	Æger ...	Ship	LEF	Belridge ...	Ship
LBB	Glommen ...	Ship	LEG	Hessa ...	Ship
LBC	Garm ...	Ship	LEH	Salta ...	Ship
LBD	Froya ...	Ship	LEI	Ingoy Radio ...	Norway
LBE	Sarpen ...	Ship	LEI	Ingoy Radio ...	Norway
LBF	Sild ...	Ship	LEJ	King Horn ...	Ship
LBG	Ravn ...	Ship	LEJ	Libau ...	Latvia
LBI	Grib ...	Ship	LEK	Nidaros ...	Ship
LBJ	Orn ...	Ship	LEL	Jason LEL ...	Ship
LBN	Laugen ...	Ship	LEM	Salvator LEM ...	Ship
LBZ	Karljohansvern ...	Norway	LEN	Sørvaagen ...	Norway
LCA	Knut Jarl ...	Ship	LEO	Kamfjord ...	Ship
LCB	Thomas Haaland ...	Ship	LEP	Rodskjaer ...	Ship
LCC	Erie ...	Ship	LEQ	Brazil LEQ ...	Ship
LCD	Rio Grande ...	Ship	LER	Bayard...	Ship
	LCD ...	Ship	LES	Meline ...	Ship
LCE	Randsfjord ...	Ship	LET	Tjome Radio ...	Norway
LCF	Tyrfjord ...	Ship	LEU	Roisheim ...	Ship
LCG	Mirjam...	Ship	LEV	Mesna ...	Ship
LCH	Tryvandshiden ...	Norway	LEW	Simla ...	Ship
LCH	Christiana ...	Norway	LEX	Rinda ...	Ship
LCI	Vela ...	Ship	LEY	Baltique ...	Ship
LCJ	Camilla Gilbert ...	Ship	LEZ	Bastant ...	Ship
LCK	Gijones ...	Ship	LFA	Hallbjorg ...	Ship
LCL	Belgot ...	Ship	LFB	Bergensfjord ...	Ship
LCM	Stavanger ...	Norway	LFC	Atna ...	Ship
LCN	Elida Clausen ...	Ship	LFD	Rena ...	Ship
LCO	Rygja ...	Ship	LFE	Vinstra... ..	Ship
LCP	Hörda ...	Ship	LEF	Tysla ...	Ship
LCR	Foldenfjord ...	Ship	LFG	Spitzbergen ...	Spitzbergen
LCS	Ottawa ...	Ship	LFH	Iris LFH ...	Ship
LCT	Besseggen ...	Ship	LFI	Talabot ...	Ship
LCU	Storborg ...	Ship	LFJ	Mira ...	Ship
LCV	Ula LCV ...	Ship	LFK	Anna Sophie ...	Ship
LCW	Ullstad... ..	Ship	LFL	Drammensfjord ...	Ship
LCX	Landaas ...	Ship	LFM	Lygenfjord ...	Ship
LCY	Samnanger ...	Ship	LFN	Veni ...	Ship
LCZ	Porsanger ...	Ship	LFO	Strinda ...	Ship
LDA	Bessheim ...	Ship	LFP	Mendocino ...	Ship
LDB	Sterling LDB ...	Ship	LFQ	George Washing- ton LFQ ...	Ship
LDC	Havö ...	Ship	LFR	Röst Radio ...	Norway
LDD	Birk ...	Ship	LFR	Röst Radio ...	Norway
LDE	Thordis ...	Ship	LFS	Stavangerfjord ...	Ship
LDF	Flekhero ...	Norway	LFT	Hallfried ...	Ship
LDG	Norvega ...	Ship	LFU	Eidsfjeld ...	Ship
LDH	Mexicano LDH ...	Ship	LFV	Skogheim ...	Ship
LDI	Sygna ...	Ship	LFW	Yarra LFW ...	Ship
LDJ	Mathilda ...	Ship	LFY	Salvage ...	Ship
LDK	Kong Harald ...	Ship	LFZ	Nordvaag ...	Ship
LDL	Haakon VII ...	Ship	LGA	Songdal ...	Ship
LDM	Rio de Janeiro ...	Ship	LGB	Songvand ...	Ship
	LDM ...	Ship	LGC	Songvaar ...	Ship
LDN	Rio de la Plata ...	Ship	LGD	Hanna Nielsen ...	Ship
	LDN ...	Ship	LGD	Hamlet ...	Ship
LDO	Venus LDO ...	Ship	LGE	Argentina LGE ...	Ship
LDP	Solferino LDP ...	Ship	LGF	Kalfarli ...	Ship
LDQ	Irma ...	Ship	LGG	Vaarli ...	Ship
LDR	Zeta ...	Ship	LGH	Niels Nielsen ...	Ship
LDS	Cometa ...	Ship	LGJ	Luisse Nielsen ...	Ship
LDT	Snar ...	Ship	LGK	Utsire Radio ...	Norway
LDU	Christian Börs ...	Ship	LGK	Utsire Radio ...	Norway
LDV	Orn II ...	Ship			

LGL	Capto	Ship	LJA	Faro San Antonio	Argentina
LGM	Golaa	Ship	LJB	Punta Mogotes	Argentina
LGN	Bergen Radio	Norway	LJC	Punta Delgrade	Argentina
LGN	Bergen	Norway	LJD	San Julian ...	Argentina
LGO	Wellington LGO	Ship	LJF	Rio Grande ...	Argentina
LGP	Hallgjerd ...	Ship	LJK	Panton Practicos	
LQG	Key West ...	Ship		Recalada ...	Argentina
LGR	Golden Gate ...	Ship	LJL	Interseccion Rio de la Plata	
LGS	Ranenfjord ...	Ship		Ponton ...	Argentina
LGT	Bessa	Ship	LJM	Recalada Bahia Blanca Ponton	
LGU	Tancred LGU...	Ship		Faro ...	Argentina
LGV	Erich Lindoe ...	Ship	LJO	Rivadavia ...	Ship
LGW	Borgland ...	Ship	LJR	Moreno...	Ship
LGX	Breifond ...	Ship	LJV	Belgrano LJV...	Ship
LGY	Hercules LGY	Ship	LJW	S. Martin LJW	Ship
LGZ	Dicto	Ship	LJX	Pueyrredón ...	Ship
LHA	Fynd	Ship	LJY	Garibaldi ...	Ship
LHB	Sinaloa... ..	Ship	LKA	Almirante Brown	Ship
LHC	Baja California	Ship	LKC	Buenos Aires LKC	Ship
LHD	Regulus LHD...	Ship	LKD	Nieve de Julio	Ship
LHE	Gaute	Ship	LKH	Fragata Sarmiento	Ship
LHF	Utsire	Ship	LKJ	Libertad ...	Ship
LHG	Pluto	Ship	LKK	Independencia	Ship
LHH	Grena	Ship	LKL	Rosario LKL...	Ship
LHI	Balto	Ship	LKM	Parana LKM...	Ship
LHJ	Storviken ...	Ship	LKO	Plata (El.) LKO	Ship
LHK	Bjonongen ...	Ship	LKR	Andes (Lós) LKR	Ship
LHL	Solstreif ...	Ship	LKV	Patria LKV ...	Ship
LHM	Breda LHM ...	Ship	LLA	Catamarca ...	Ship
LHN	Brussel... ..	Ship	LLB	Cordoba LLB...	Ship
LHO	Bruse	Ship	LLC	Plata (La.) LLC	Ship
LHP	Rigel LHP ...	Ship	LLD	Jujuy	Ship
LHQ	Mirita	Ship	LLH	Entre R'ios ...	Ship
LHR	Madrono ...	Ship	LLI	Corrientes LLI	Ship
LHS	Otta	Ship	LLJ	Misiones ...	Ship
LHT	Pythia	Ship	LLQ	Bahia Blanca...	Ship
LHU	Bjornstjerne Bjornson	Ship	LLR	Pampa	Ship
LHV	Ravnanger ...	Ship	LLS	Chaco	Ship
LHW	August	Ship	LLT	Guardia Nacional	Ship
LHX	Sydfold	Ship	LLU	Rio Negro LLU	Ship
LHY	Solveg Skogland	Ship	LLV	Patagonia ...	Ship
LHZ	Dovretjell ...	Ship	LLW	Primero de Mayo	Ship
LIA	Darsena Norte	Argentina	LLX	Vicente Fidel Lopez	Ship
LIB	Trelew	Argentina	LMA	Alferez Mackinlay	Ship
LIB	Rio Santiago ...	Argentina	LMB	Piedrabuena ...	Ship
LIC	Mogotes Point Light	Argentina	LMC	Ingeniero Iribas	Ship
LIC	Gallegos	Argentina	LMD	Uruquay LMD	Ship
LID	Recalapa Light-ship	Argentina	LMH	Azopardo ...	Ship
LIE	Puerto Militar...	Argentina	LMI	Gaviota LMI ...	Ship
LIF	Cape Virgins ...	Argentina	LMJ	Ona	Ship
LIG	Corrientes ...	Argentina	LMK	Querandi ...	Ship
LIH	Ushuaia	Argentina	LMX	Ingeniero Luis A. Huergo	Ship
LIH	Buenos Aires ...	Argentina	LMY	Aristobulo del Valle	Ship
LIM	San Julian ...	Argentina	LMZ	Ministro Ecurra	Ship
LIO	Año Nuevo ...	Argentina	LNA	Direccion Gen. de Arsenales de Guerra	Argentina
LIP	Comodoro Rivadavia ...	Argentina	LNC	Cordoba ...	Argentina
LIS	Rio Grande ...	Argentina	LND	Palomar (El) ...	Argentina
LIS	Puerto Aguirre	Argentina	LNG	Colegio Militar	Argentina
LIT	Eldorado	Argentina			
LIU	Formosa	Argentina			
LIV	Posados Misiones	Argentina			
LIV	Paz (La)	Argentina			
LIX	Zarate	Argentina			
LIY	Martin Garcia...	Argentina			
LIZ	Rio Santiago ...	Argentina			

LNL	Liniers ...	Argentina	LSZ	Breynton ...	Ship
LNM	Mendoza ...	Argentina	LTB	Jabiru ...	Ship
LNR	Comando 1ra		LTC	Benlomond ...	Ship
	Division		LTD	Kekerangu ...	Ship
	Ejercito ...	Argentina	LTF	Hillhouse ...	Ship
LNS	Comando 2da		LTG	Speaker ...	Ship
	Division		LTI	Clearpool ...	Ship
	Ejercito ...	Argentina	LTJ	Millpool ...	Ship
LNT	Tucuman ...	Argentina	LTM	Albuera ...	Ship
LPA	Rosario de		LTR	Manx Isles ...	Ship
	Santa Fé ...	Argentina	LTS	Clan MacWilliam	Ship
LPB	Parana ...	Argentina	LTU	Neva ...	Ship
LPC	Corrientes ...	Argentina	LTV	Mahana ...	Ship
LPD	Puerto Bermejo	Argentina	LTW	Mahia ...	Ship
LPK	Draga 212C. ...	Ship	LTX	Saxoleine ...	Ship
LPL	Draga 211C. ...	Ship	LTY	Vestalia ...	Ship
LPM	Draga 210C. ...	Ship	LTZ	Nagara LTZ ...	Ship
LPN	Draga 209C. ...	Ship	LUA	Ariadne ...	
LPO	Draga 16C. ...	Ship		Alexandra ...	Ship
LPP	Draga 14C. ...	Ship	LUB	Hannington	
LPO	Draga 13C. ...	Ship		Court ...	Ship
LQA	Berna ...	Ship	LUC	City of Win-	
LQB	Bruselas ...	Ship		chester ...	Ship
LQC	Ciudad de		LUD	Wedgewood ...	Ship
	Buenos Aires	Ship	LUE	Capsa ...	Ship
LQD	Colonia LQD ...	Ship	LUG	Cymric Vale ...	Ship
LQE	Eolo LQE ...	Ship	LUI	Brockdale ...	Ship
LQF	Formosa ...	Ship	LUJ	Tremayne ...	Ship
LQG	Gurrany ...	Ship	LUK	Wimbleton ...	Ship
LQH	Helios ...	Ship	LUL	Ethelwolf ...	Ship
LQI	Humaiti ...	Ship	LUM	Ethelarie ...	Ship
LQJ	Labrador LQJ	Ship	LUN	War, Bahadur	Ship
LQK	Lambare ...	Ship	LUQ	Maihar ...	Ship
LQL	Londres ...	Ship	LUR	Manaar ...	Ship
LQM	Paris LQM ...	Ship	LUS	Courtown ...	Ship
LQN	S. Martin LQN	Ship	LUT	Afghanistan ...	Ship
LQO	Triton LQO ...	Ship	LUV	Laplace LUV	Ship
LQP	Venus LQP ...	Ship	LUY	Astronomer ...	Ship
LQQ	Washington LQQ	Ship	LWA	Jessie ...	Ship
LQZ	Flecha ...	Ship	LWB	Knut Hamsun	Ship
LRA	Cabo Corrientes	Ship	LWC	Sisto ...	Ship
LRA	Americano ...	Ship	LWD	Daghild ...	Ship
LRB	Cabo Santa Maria	Ship	LWE	Straekodder ...	Ship
LRC	Camarones ...	Ship	LWF	Professor Gruvel	Ship
LRD	Presidente Mitre	Ship	LWG	Gustav Vigeland	Ship
LRE	Presidente		LWH	Hermelin ...	Ship
	Quintana ...	Ship	LWI	Homledal ...	Ship
LRJ	Rio Uruguay ...	Ship	LWJ	Sveip Jarl ...	Ship
LRN	Argentino ...	Ship	LWK	Graziella LWK	Ship
LRO	Asturiano ...	Ship	LWL	Hovland ...	Ship
LRP	Atlantico ...	Ship	LWM	Ingeborg	
LRW	Doce de Octubre	Ship		Bakkevig ...	Ship
LRX	S. Cruz LRX ...	Ship	LWN	Norefjord ...	Ship
LSA	W. I. Radcliffe	Ship	LWO	Alaska ...	Ship
LSC	Mineric ...	Ship	LWQ	Orwell ...	Ship
LSE	Seamew ...	Ship	LWR	Sirrah LWR ...	Ship
ISH	Clan Menzies ...	Ship	LWS	Sirius LWS ...	Ship
ISI	John Harrison	Ship	LWT	Times ...	Ship
LSJ	Graphic ...	Ship	LWU	Alstad ...	Ship
LSM	Patriotic ...	Ship	LWV	Nils ...	Ship
ISO	Treloske ...	Ship	LWW	Tento ...	Ship
LSQ	Bampton ...	Ship	LWX	Atlantis ...	Ship
LSR	Clan Murray ...	Ship	LWY	Truth ...	Ship
IST	Millais ...	Ship	LWZ	Maud LWZ ...	Ship
ISU	Bloomfield ...	Ship	LZF	Varna ...	Bulgaria
LSV	Utah ...	Ship	MAA	Carmania ...	Ship
LSW	King City ...	Ship	MAB	Kandahar ...	Ship
LSX	Dorie ...	Ship	MAC	S. Gregorio ...	Ship
LSY	Buranda ...	Ship	MAD	Musician ...	Ship

MAG	City of Chester	Ship	MFN	Pretorian ...	Ship
MAJ	Calabria MAJ	Ship	MFQ	Borda ...	Ship
MAM	Matoppe ...	Ship	MFS	Banca ...	Ship
MAN	S. Dunstano ...	Ship	MFT	Clifden Radio...	G.B.
MAO	S. Tirso ...	Ship	MFU	Aeneas ...	Ship
MAQ	Bolton Castle ...	Ship	MFV	Ascanius ...	Ship
MAR	Italia MAR ...	Ship	MFV	Anchises ...	Ship
MAU	Cardiganshire ...	Ship	MFV	Leeway ...	Ship
MAV	Swazi ...	Ship	MFY	Kelvinbrae ...	Ship
MAZ	Arona ...	Ship	MGA	Mauretania ...	Ship
MBC	Baltic MBC ...	Ship	MGD	Baron Jedburgh	Ship
MBE	Lumen ...	Ship	MGF	Orcana... ..	Ship
MBF	Saturnia ...	Ship	MGG	S. Albans ...	Ship
MBG	Araguaya ...	Ship	MGI	Orbita ...	Ship
MBO	Avon ...	Ship	MGJ	Oruba MGJ ...	Ship
MBR	S. Ricardo ...	Ship	MGK	Demosthenes ...	Ship
MBT	Rimutaka ...	Ship	MGM	Themistocles	
MBV	Chignecto ...	Ship		MGM ...	Ship
MBW	Maryland ...	Ship	MGO	Orca ...	Ship
MBX	Elveric ...	Ship	MGP	Orduna ...	Ship
MCD	Viking MCD ...	Ship	MGR	Rassay... ..	Ship
MCE	Khyber ...	Ship	MGR	Mongalla ...	Sudan
MCF	Canada MCF ...	Ship	MGX	Kirnwood ...	Ship
MCG	Cambria MCG... ..	Ship	MGZ	Khiva ...	Ship
MCH	Bandra ...	Ship	MHB	Indian ...	Ship
MCJ	Telconia ...	Ship	MHC	Adriatic ...	Ship
MCN	Corsican MCN ...	Ship	MHG	Carpentaria ...	Ship
MCP	Ceramic ...	Ship	MHH	Poole ...	G.B.
MCO	Munster ...	Ship	MHI	Olympia MHI ...	Ship
MCW	Ulster MCW ...	Ship	MHJ	Scindia... ..	Ship
MCX	River Trent ...	Ship	MHK	Sapphire ...	Ship
MCY	City of Madras	Ship	MHO	Cordobes ...	Ship
MDA	Highland Enter- prise ...	Ship	MHQ	Massilia MHQ... ..	Ship
			MHR	Oxonian ...	Ship
MDC	Cedric ...	Ship	MHT	Arabestan ...	Ship
MDE	Denis ...	Ship	MHV	Craftsman MHV	Ship
MDG	Francis... ..	Ship	MHX	Penrhys ...	Ship
MDI	Pancras ...	Ship	MHY	Paparoa ...	Ship
MDM	Hildebrand ...	Ship	MHZ	S. Valerio ...	Ship
MDT	Caledonian ...	Ship	MID	Orlando ...	Ship
MDW	Worsley Hall ...	Ship	MIG	Memnon MIG... ..	Ship
MDX	Lena ...	Ship	MII	Potosi ...	Ship
MDZ	Arundel ...	Ship	MIL	Palermo MIL... ..	Ship
MEB	Ninian ...	Ship	MIP	Intaba ...	Ship
MED	Cassandra ...	Ship	MIR	Malakal ...	Sudan
MEE	Electra... ..	Ship	MIT	Genesee MIT ...	Ship
MEF	John Pender ...	Ship	MIU	Andorinha ...	Ship
MEG	Norseman ...	Ship	MIW	Somali MIW ...	Ship
MEH	Magnet ...	Ship	MIX	Monadnock MIX	Ship
MEI	Iroquois MEI ...	Ship	MIV	Suwanee ...	Ship
MEJ	Recorder ...	Ship	MJC	Suevic ...	Ship
MEK	Highland Heather ...	Ship	MJF	Orcoma ...	Ship
			MJG	Orita ...	Ship
MEM	Patrol MEM ...	Ship	MJH	Haverford ...	Ship
MEN	Navahoe ...	Ship	MJJ	Oriana ...	Ship
MEO	Nortonian ...	Ship	MJK	Ortega ...	Ship
MEP	Highland Laird	Ship	MJL	Antillian ...	Ship
MER	Highland Watch	Ship	MJM	Merion ...	Ship
MES	Raeburn ...	Ship	MJN	Scotian... ..	Ship
MET	Raphael ...	Ship	MJP	S. je Ronimo ...	Ship
MEV	Romney ...	Ship	MJO	Westmeath ...	Ship
MEW	Nellore ...	Ship	MJS	Baron Napier... ..	Ship
MEY	Rossetti ...	Ship	MJT	Llanstephan Ctle	Ship
MEZ	Ocean Prince ...	Ship	MJV	S. Edwardo ...	Ship
MFB	Sentinel ...	Ship	MJW	Vauban ...	Ship
MFJ	Cormorant MFJ	Ship	MJX	Hartington ...	Ship
MFK	Sheraro Osborn	Ship	MJZ	Vestris ...	Ship
MFL	Winifredian ...	Ship	MKA	Ruahine ...	Ship
MFM	Aidan ...	Ship	MKA	Caronia ...	Ship

MKB	Ruapehu ...	Ship	MPP	Melanier ...	Ship
MKC	Olympic ...	Ship	MPQ	Dunvegan Cstle.	Ship
MKD	Palma MKD ...	Ship	MPR	Barpeta ...	Ship
MKG	Delta ...	Ship	MPS	S. Zeferino ...	Ship
MKK	Medic ...	Ship	MPV	Pathan MPV ...	Ship
MKK	Malakand ...	Ship	MPW	Balmoral Castle	Ship
MKL	Asian ...	Ship	MPX	Masirah ...	Ship
MKO	Chinkoa ...	Ship	MPZ	Guildford Castle	Ship
MKR	Beltana ...	Ship	MQC	Persic ...	Ship
MKV	Remuera ...	Ship	MQD	Caraquet ...	Ship
MKW	Great City ...	Ship	MQE	Edinburgh Ctle.	Ship
MKZ	Ascot ...	Ship	MOF	Kenilworth Cstle.	Ship
MLA	Minnie de		MOG	Armadaale Castle	Ship
	Larrinaga ...	Ship	MOH	Walmer Castle	Ship
MLC	Celtic MLC ...	Ship	MOI	Saxon MQI ...	Ship
MLD	Ranger MLD ...	Ship	MOJ	Briton ...	Ship
MLG	Missouri MLG ...	Ship	MOK	Kildonan Castle	Ship
MLL	Barranca MLL ...	Ship	MLQ	Kinfauns Castle	Ship
MLS	Manzanares ...	Ship	MQN	Durham Castle	Ship
MLT	Matina ...	Ship	MQO	Dunluce Castle	Ship
MLV	Nicoya ...	Ship	MQP	Garth Castle ...	Ship
MLX	Sheaf Dart ...	Ship	MQQ	Grantully Castle	Ship
MLY	Pacuare ...	Ship	MQS	Glengorm Castle	Ship
MMB	Mackay-Bennett	Ship	MQU	Gaika ...	Ship
MMC	Reresby ...	Ship	MOV	Gascon ...	Ship
MMD	Malwa ...	Ship	MQW	Goorkha ...	Ship
MME	Mantua ...	Ship	MQX	Wallace ...	Ship
MMF	Morea ...	Ship	MQY	S. Patricio ...	Ship
MMI	Macedonia ...	Ship	MQZ	Gloucester Cstle.	Ship
MMU	China MMU ...	Ship	MRB	Tudorstar ...	Ship
MMX	Matheran ...	Ship	MRC	Cretic ...	Ship
MNA	Pannonia ...	Ship	MRF	Hordrata ...	Ship
MNB	Soudan ...	Ship	MRG	Opawa ...	Ship
MNC	Scandinavian ...	Ship	MRH	Elysia ...	Ship
MND	S. Lorenzo MND	Ship	MRI	Whakatane ...	Ship
MNE	Menominee MNE	Ship	MRJ	Aylesbury ...	Ship
MNG	Digby ...	Ship	MRL	Dieppe ...	Ship
MNH	Dongola ...	Ship	MRM	Orari ...	Ship
MNI	Iris MNI ...	Ship	MRO	Romanstar ...	Ship
MNJ	Plassy ...	Ship	MRQ	Andes MRQ ...	Ship
MNT	Camerian MNT	Ship	MRS	Kaikoura ...	Ship
MNU	Caledonia ...	Ship	MRV	Waiwera ...	Ship
MNX	Raithwaite ...	Ship	MRW	Kansas MRW	Ship
MNZ	City of Agra ...	Ship	MRZ	S. Melito ...	Ship
MOB	Hardanger ...	Ship	MSA	Saxonia ...	Ship
MOC	Clan Macintyre	Ship	MSC	Ibex ...	Ship
MOE	Benefactor ...	Ship	MSD	Reindeer MSD	Ship
MOF	Orsova ...	Ship	MSD	Karama ...	Ship
MOI	Columbia MOI	Ship	MSE	Euripides ...	Ship
MOJ	Stephen ...	Ship	MSH	Tanda ...	Ship
MOJ	Orvieto ...	Ship	MSI	Kaisar-I-Hind...	Ship
MOL	Sachem ...	Ship	MSK	Moscow ...	Russia
MOM	Norman ...	Ship	MSL	Trafford Hall ...	Ship
MOO	Assaye ...	Ship	MSM	Nemesis ...	Ship
MOR	Takaoa ...	Ship	MSO	Poona ...	Ship
MOU	Devanha ...	Ship	MSP	Malpe MSP ...	Ship
MOV	Brighton MOV	Ship	MSQ	Knight of the	
MOW	Carisbrook Ctle.	Ship		Garter ...	Ship
MOX	Astraea ...	Ship	MSR	Varela ...	Ship
MOY	Osterley ...	Ship	MSS	Baron Berwick	Ship
MPB	Empress of		MST	Bamora ...	Ship
	Britain ...	Ship	MSU	Aquitania ...	Ship
MPC	Canopic ...	Ship	MSW	City of Exeter...	Ship
MPD	Poldhu Radio	G.B.	MSX	Flandrier ...	Ship
MPE	King Orry ...	Ship	MSZ	Caesarea ...	Ship
MPG	Tamar ...	Ship	MTB	Wyneric ...	Ship
MPM	Changuinloa ...	Ship	MTE	Risaldar ...	Ship
MPN	Motagua ...	Ship	MTF	Karmala ...	Ship
MPO	Cassis ...	Ship	MTH	Walton Hall ...	Ship

MTJ	Ebro ...	Ship	MXZ	Tiverton MXZ	Ship
MTK	Essequibo ...	Ship	MYA	Herefordshire	Ship
MTL	Collegian ...	Ship	MYB	Derbyshire ...	Ship
MTM	City of Madrid	Ship	MYE	Oxfordshire ...	Ship
MTN	Tunisian ...	Ship	MYF	Chyebassa ...	Ship
MTO	Rose ...	Ship	MYG	Gloucestershire	Ship
MTP	City of Rangoon	Ship	MYH	Clear Way ...	Ship
MTQ	Dacre Castle ...	Ship	MYJ	Elwick ...	Ship
MTV	North Western		MYL	Leicestershire ...	Ship
	Miller ...	Ship	MYN	Tahiti ...	Ship
MTX	Zealand ...	Ship	MYP	Stuartship ...	Ship
MTY	South Western		MYQ	Strombus ...	Ship
	Miller ...	Ship	MYS	S. Silvestre ...	Ship
MUA	Herschel ...	Ship	MYT	Corbrae ...	Ship
MUB	Holbein ...	Ship	MYX	Laertes ...	Ship
MUE	Gleniffer ...	Ship	MYZ	Politician ...	Ship
MUG	City of Hahkow	Ship	MZB	Cardium ...	Ship
MUH	S. Nazario ...	Ship	MZC	Megantic ...	Ship
MUI	Lucerna ...	Ship	MZD	Telima ...	Ship
MUK	Sir Harvey		MZE	Akabo ...	Ship
	Adamson ...	Ship	MZH	Mitra ...	Ship
MUL	Frank Parish ...	Ship	MZI	Elmina... ..	Ship
MUM	Borderland ...	Ship	MZN	Natica ...	Ship
MUN	Sicilian... ..	Ship	MZP	Ranella ...	Ship
MUO	Chakdara ...	Ship	MZQ	Clan Matheson	Ship
MUP	Morvada ...	Ship	MZR	Carnarvonshire	Ship
MUQ	S. Florentino ...	Ship	MZV	Vita ...	Ship
MUS	Carmarthenshire	Ship	MZW	Nirvana ...	Ship
MUT	Pembrokeshire	Ship	MZX	Chelmsford ...	G.B.
MUU	Carnarvon Radio	G.B.	MZY	Chakdina ...	Ship
MUX	S. Fernando ...	Ship	MZZ	Pasha ...	Ship
MUZ	Zealandic ...	Ship	NAA	Washington ...	U.S.A.
MVB	Peel Castle ...	Ship	NAA	Arlington ...	U.S.A.
MVD	Omarra ...	Ship	NAB	Portland ...	U.S.A.
MVI	Hubert... ..	Ship	NAB	Cape Elizabeth	U.S.A.
MVN	Victorian ...	Ship	NAC	Portsmouth ...	U.S.A.
MVO	Warwickshire	Ship	NAD	Gloucester ...	U.S.A.
MVP	Gallic ...	Ship	NAD	Fourth Cliff ...	U.S.A.
MVQ	Abinsi ...	Ship	NAD	Deer Island ...	U.S.A.
MVQ	Viking MVQ ...	Ship	NAD	Boston ...	U.S.A.
MVS	Sussex ...	Ship	NAE	North Truro ...	U.S.A.
MVV	Explorer MVV	Ship	NAE	Cape Cod ...	U.S.A.
MVY	Inventor ...	Ship	NAF	Newport ...	U.S.A.
MWB	Maine MWB ...	Ship	NAF	Price's Neck ...	U.S.A.
MWC	Runic ...	Ship	NAH	New York ...	U.S.A.
MWD	Victoria MWO	Ship	NAH	Sandy Hook ...	U.S.A.
MWE	Akawa ...	Ship	NAH	Fire Island ...	U.S.A.
MWF	Tainui ...	Ship	NAH	Amagansett ...	U.S.A.
MWG	Mexico MWG ...	Ship	NAH	Manasquin ...	U.S.A.
MWI	Ionic ...	Ship	NAI	Philadelphia ...	U.S.A.
MWK	Quillota ...	Ship	NAJ	Great Lakes ...	U.S.A.
MWM	Guatemala ...	Ship	NAK	Naval Academy	U.S.A.
MWN	Athenic ...	Ship	NAK	Annapolis ...	U.S.A.
MWQ	Chakla... ..	Ship	NAL	Washington ...	U.S.A.
MWR	Dorington Court	Ship	NAM	Norfolk ...	U.S.A.
MWT	Corinthic ...	Ship	NAN	Morehead City	U.S.A.
MWW	Baron Ardrossan	Ship	NAN	Cape Lookout	U.S.A.
MWY	Circassia ...	Ship	NAN	Beaufort ...	U.S.A.
MWZ	Castalia MWZ	Ship	NAO	Charleston ...	U.S.A.
MXD	Vindelia ...	Ship	NAP	St. Augustine ...	U.S.A.
MXF	Oakfield ...	Ship	NAQ	Jupiter... ..	U.S.A.
MXG	Kenmare MXG	Ship	NAR	Key West ...	U.S.A.
MXH	Sheaf Spear ...	Ship	NAS	Pensacola ...	U.S.A.
MXI	Ingleby ...	Ship	NAT	New Orleans ...	U.S.A.
MXJ	Stuart Prince ...	Ship	NAV	San Juan ...	U.S.A.
MXM	Cordelia MXM	Ship	NAV	Parris Island ...	U.S.A.
MXN	Westmore ...	Ship	NAV	Port Royal ...	U.S.A.
MXR	Delphinula ...	Ship	NAW	Guantanamo	Cuba
MXX	Portreath ...	Ship	NAX	Colon ...	Panama

NAY	Point Isabel ...	U.S.A.	NAJP	Finch ...	Ship
NAZ	Managua ...	Nicaragua	NAJQ	Bancroft ...	Ship
NABB	T-2 ...	Ship	NAJR	Gregory ...	Ship
NABC	Niagara NABC	Ship	NAJS	Light Vessel	
NABG	Charles S. Osbourne ...	Ship	NAJT	No. 52 ...	U.S.A.
NABJ	Light Vessel No. 66 ...	U.S.A.	NAJV	Light Vessel No. 88 ...	U.S.A.
NABP	Anemone ...	Ship		No. 101 ...	U.S.A.
NABS	Tanager ...	Ship	NAJX	Robinson ...	Ship
NABT	Light Vessel No. 93 ...	U.S.A.	NAJZ	Welles ...	Ship
NABV	Light Vessel No. 80 ...	U.S.A.	NAKD	Ajax NAKD ...	Ship
NABX	Light Vessel No. 84 ...	U.S.A.	NAKK	Kilty ...	Ship
NABZ	T-3 ...	Ship	NAKL	Heather ...	Ship
NACB	Apache NACB	Ship	NAKN	Hibiscus ...	Ship
NACL	Hale ...	Ship	NAKS	Light Vessel No. 70 ...	U.S.A.
NACN	Dyer ...	Ship		S. Francisco	
NACP	Stringham ...	Ship	NAKT	Light Vessel No. 69 ...	U.S.A.
NACQ	McKee ...	Ship	NAKV	Ivy ...	Ship
NACR	Rathburne ...	Ship	NALC	Lapwing ...	Ship
NACS	Owl ...	Ship	NALM	Boreas NALM...	Ship
NACT	Light Vessel No. 83 ...	U.S.A.	NALP	Kingfisher	
NACV	Light Vessel No. 67 ...	U.S.A.	NALQ	NALP ...	Ship
NACX	Light Vessel No. 41 ...	U.S.A.	NALR	S.P.164	Ship
NACZ	Allegheny NACZ	Ship	NALS	Taylor NALR...	Ship
NADD	Arcata ...	Ship		Light Vessel No. 87 ...	U.S.A.
NADF	Crowninshield ...	Ship	NALS	Ambros Channel	
NADL	Kimberly ...	Ship		Light Vessel	U.S.A.
NADP	Avocet ...	Ship	NALT	Ringgold ...	Ship
NADQ	S.P.1232 ...	Ship	NALV	Laurel NALV	Ship
NADT	Light Vessel No. 91 ...	U.S.A.	NALZ	Stoddert ...	Ship
NADV	Light Vessel No. 79 ...	U.S.A.	NAMB	Larkspur ...	Ship
NADX	Light Vessel No. 54 ...	U.S.A.	NAMC	O.7 ...	Ship
NAFC	Dickerson ...	Ship	NAMD	Reno NAMD ...	Ship
NAFL	Leary ...	Ship	NAMG	General Alava	Ship
NAFN	Cardinal ...	Ship	NAMM	Nokomis ...	Ship
NAFP	Cayuga NAFP	Ship	NAMN	Narragansett	
NAFR	Arctic ...	Ship		NAMN ...	Ship
NAFS	Burns ...	Ship	NAMR	O.3 ...	Ship
NAFT	Light Vessel No. 73 ...	U.S.A.	NAMS	Light Vessel No. 74 ...	U.S.A.
NAFV	Fern ...	Ship	NAMT	Boggs ...	Ship
NAFX	R.17 ...	Ship	NAMV	Madrona ...	Ship
NAFZ	Semmes ...	Ship	NAMX	O.4 ...	Ship
NAGB	O.9 ...	Ship	NAMZ	O.5 ...	Ship
NAGC	Satterlee ...	Ship	NANB	O.6 ...	Ship
NAGG	Mason ...	Ship	NAND	O.8 ...	Ship
NAGJ	Graham ...	Ship	NANQ	Robin NANQ	Ship
NAGL	Chandler ...	Ship	NANS	Light Vessel No. 47 ...	U.S.A.
NAGM	Arbutus ...	Ship		Light Vessel No. 5 ...	U.S.A.
NAGT	Light Vessel No. 102 ...	U.S.A.	NANV	Mangrove ...	Ship
NAGV	Hyacinth ...	Ship	NANZ	Farquhar ...	Ship
NAGX	Gwin ...	Ship	NAPG	Seattle NAPG	Ship
NAJB	Sigourney ...	Ship	NAPK	Stevens ...	Ship
NAJC	Relief Lightship No. 53 ...	U.S.A.	NAPL	Talbot ...	Ship
NAJD	Black Hawk ...	Ship	NAPM	Converse ...	Ship
NAJK	Southard ...	Ship	NAPN	Teal ...	Ship
NAJL	Colhoun ...	Ship	NAPP	Light Vessel No. 42 ...	U.S.A.
			NAPR	Camden NAPR	Ship
			NAPS	Magnolia NAPS	Ship
			NAPT	Amaranth ...	Ship
			NAPV	Maple NAPV ...	Ship

NAQB	Light Vessel No. 20 ...	U.S.A.	NBA	Balboa ...	Panama
NAQC	Piscataqua ...	Ship	NBB	S. Thomas ...	Virgin Is.
NAQD	Yukon NAQD ...	Ship	NBD	Bar Harbor ...	U.S.A.
NAQF	Widgeon ...	Ship	NBG	Indian Head ...	U.S.A.
NAQM	S.P.2047 ...	Ship	NBJ	Albany NBJ ...	Ship
NAQN	Paul Hamilton ...	Ship	NBL	Alert NBL ...	Ship
NAQS	Light Vessel No. 3 ...	U.S.A.	NBM	Amagansett ...	U.S.A.
NAQV	Marigold ...	Ship	NBP	Ammon ...	Ship
NARC	Maryland NARC ...	Ship	NBR	Annapolis NBR ...	Ship
NARF	Wandank ...	Ship	NBR	Surfside ...	U.S.A.
NARG	Chemung ...	Ship	NBS	Siasconset ...	U.S.A.
NARN	Montauk ...	Ship	NBV	Arkansas ...	Ship
NARP	Aramis ...	Ship	NBW	Arizona ...	Ship
NARR	William Jones ...	Ship	NBX	Port Eads ...	U.S.A.
NARS	Light Vessel No. 44 ...	U.S.A.	NBY	Port Eads ...	U.S.A.
NART	Light Vessel No. 1 ...	U.S.A.	NBZ	Baltimore ...	U.S.A.
NARV	Light Vessel No. 11 ...	U.S.A.	NCA	Nevada NCA ...	Ship
NARX	Ram Island Reef Light Vessel ...	U.S.A.	NCB	Oklahoma ...	Ship
NARZ	R.20 ...	Ship	NCC	New York NCC ...	Ship
NASB	Light Vessel No. 39 ...	U.S.A.	NCD	Texas NCD ...	Ship
NASC	Light Vessel No. 48 ...	U.S.A.	NCE	Pennsylvania NCE ...	Ship
NASG	Sumac ...	Ship	NCF	Bailey ...	Ship
NASJ	Gold Star NASJ ...	Ship	NCH	Baltimore ...	Ship
NASJ	Arcturas NASJ ...	Ship	NCL	Beale ...	Ship
NASM	O.16 ...	Ship	NCN	Birmingham NCN ...	Ship
NASQ	Regulus NASQ ...	Ship	NCR	Canandaigua ...	Ship
NASV	R.15 ...	Ship	NCU	Buffalo... ...	Ship
NASX	R.16 ...	Ship	NCV	Burrows ...	Ship
NATB	Antares NATB ...	Ship	NCX	Dreadnought ...	Ship
NATD	Hedge Fence Light Vessel No. 9 ...	U.S.A.	NCY	Cæsar ...	Ship
NATG	Bell NATG ...	Ship	NCZ	Hog Island ...	U.S.A.
NATJ	Wickes ...	Ship	NCZ	Virginia Beach ...	U.S.A.
NATK	O.11 ...	Ship	NCZ	Poyners Hill ...	U.S.A.
NATL	O. 12 ...	Ship	NDB	Celtic NDB ...	Ship
NATM	Woodbury ...	Ship	NDD	Sayville ...	U.S.A.
NATS	Umpqua ...	Ship	NDF	California ...	Ship
NATT	Waters ...	Ship	NDG	Chester ...	Ship
NAVM	Explorer NAVM ...	Ship	NDH	Cheyenne NDH ...	Ship
NAVS	Stribling ...	Ship	NDI	Chicago NDI ...	Ship
NAXJ	Montgomery ...	Ship	NDJ	Gorgona NDJ ...	Ship
NAXK	Murray ...	Ship	NDM	Cleveland ...	Ship
NAXL	Great Northern NAXL ...	Ship	NDN	Pueblo ...	Ship
NAXL	Columbia NAXL ...	Ship	NDO	Comfort ...	Ship
NAXM	Vega NAXM ...	Ship	NDQ	Connecticut ...	Ship
NAXN	Kewaydin ...	Ship	NDR	Lydonia ...	Ship
NAXS	O.15 ...	Ship	NDU	Culgoa ...	Ship
NAXT	O.10 ...	Ship	NDW	Cape Hatteras ...	U.S.A.
NAZC	Thompson NAZC ...	Ship	NDX	Hubbard ...	Ship
NAZJ	Light Vessel No. 34 ...	U.S.A.	NEC	George Washington ...	Ship
NAZK	Capella... ...	Ship	NEK	Delaware NEK ...	Ship
NAZL	Lamberton ...	Ship	NEL	Lakehurst ...	U.S.A.
NAZM	Kennedy ...	Ship	NEM	Denver... ...	Ship
NAZP	Bagaduce ...	Ship	NEN	Des Moines ...	Ship
NAZQ	Tadousac ...	Ship	NEO	Stockton NEO ...	Ship
NAZR	Light Vessel No. 46 ...	U.S.A.	NEQ	Dolphin NEQ ...	Ship
NAZS	Kalmia ...	Ship	NEP	Dixie ...	Ship
			NET	Drayton ...	Ship
			NEV	Savannah ...	U.S.A.
			NEX	Sea Rover ...	Ship
			NEBF	Constitution ...	Ship
			NBJ	Meade ...	Ship
			NEBV	H.9 ...	Ship
			NECD	S.P.2225 ...	Ship
			NECK	Fahrenholt ...	Ship
			NECR	Colorado ...	Ship
			NECT	Penguin ...	Ship

NECV	Palmer ...	Ship	NENM	Dallas NENM...	Ship
NECZ	Sotoyomo ...	Ship	NENN	Atlantic NENN	Ship
NEDB	Lexington NEDB	Ship	NENS	Hazelwood ...	Ship
NEDF	Constellation ...	Ship	NENT	Williams NENT	Ship
NEDG	Philip ...	Ship	NENV	Hart ...	Ship
NEDJ	West Virginia	Ship	NENX	Ingraham ...	Ship
NEDX	Nero ...	Ship	NENZ	Ludlow ...	Ship
NEFC	H.6 NEFC ...	Ship	NEPB	Hovey ...	Ship
NEFL	Swallow NEFL	Ship	NEPD	Long ...	Ship
NEFS	S.P. 181 ...	Ship	NEPF	Broome ...	Ship
NEFX	Xarifa ...	Ship	NEPG	Maury ...	Ship
NEFZ	Long Beach ...	Ship	NEPQ	Relief, Hospital	
NEGC	R.18 ...	Ship		Ship No. 1 ...	Ship
NEGD	Luce ...	Ship	NEPS	Tattnall ...	Ship
NEGF	Dent ...	Ship	NEPT	Badger ...	Ship
NEGK	R.19 ...	Ship	NEPV	Twiggs ...	Ship
NEGS	Fortune ...	Ship	NEPX	Babitt ...	Ship
NEJB	Eagle 1 ...	Ship	NEPZ	Jacob Jones ...	Ship
NEJC	Eagle 2 ...	Ship	NEQF	Montcalm ...	Ship
NEJD	Eagle 3 ...	Ship	NEQK	Mahan ...	Ship
NEJF	Eagle 4 ...	Ship	NEQM	H.4 NEQM ...	Ship
NEJG	Eagle 5 ...	Ship	NEQS	Buchanan ...	Ship
NEJJ	Eagle 6 ...	Ship	NEQT	Tillman ...	Ship
NEJK	Eagle 7 ...	Ship	NEQX	Kennison ...	Ship
NEJL	Eagle 8 ...	Ship	NERB	Gilmer ...	Ship
NEJM	Eagle 9 ...	Ship	NERG	Aulick ...	Ship
NEJN	Eagle 10 ...	Ship	NERJ	Craven ...	Ship
NEJP	Eagle 11 ...	Ship	NERL	Lansdale ...	Ship
NEJQ	Eagle 12 ...	Ship	NERO	Turner ...	Ship
NEJR	Eagle 13 ...	Ship	NERR	Gillis ...	Ship
NEJS	Eagle 14 ...	Ship	NERS	Upshur ...	Ship
NEJT	Eagle 15 ...	Ship	NERT	Greer ...	Ship
NEJV	McCourtly ...	Ship	NERV	Elliot ...	Ship
NEJX	Eagle 17 ...	Ship	NERX	Roper ...	Ship
NEJZ	Eagle 18 ...	Ship	NERZ	Breckin Ridge	Ship
NEKB	Eagle 19 ...	Ship	NESB	S.P. Lee ...	Ship
NEKD	Bothwell NEKD	Ship	NESG	Young ...	Ship
NEKF	Earp ...	Ship	NESJ	H.7 ...	Ship
NEKG	Eagle 23 ...	Ship	NESM	Breese ...	Ship
NEKJ	Eagle 24 ...	Ship	NESN	Osborne NESN	Ship
NEKM	S.P. 724 ...	Ship	NESR	Fathomer ...	Ship
NEKN	Falcon ...	Ship	NESS	Bernadon ...	Ship
NEKP	Harbor Tug		NEST	Cole ...	Ship
	No. 74 ...	Ship	NESV	Thatcher ...	Ship
NEKQ	Champlin ...	Ship	NESX	Walker NESX	Ship
NEKR	Hercules NEKR	Ship	NESZ	Crosby ...	Ship
NEKS	S.P. 1015 ...	Ship	NETB	McFarland ...	Ship
NEKZ	Manhattan		NETD	Mahopac NETD	Ship
	NEKZ ...	Ship	NETF	Lea ...	Ship
NELB	Saratoga ...	Ship	NETG	H.5 NETG ...	Ship
NELG	Dorsey ...	Ship	NETJ	O.2 ...	Ship
NELK	Pyro ...	Ship	NETQ	Tatnuck ...	Ship
NELL	Nitro ...	Ship	NETS	Meredith ...	Ship
NELN	H. 8 ...	Ship	NETT	Bush ...	Ship
NELV	Asheville ...	Ship	NETV	Cowell ...	Ship
NELX	Aaron Ward ...	Ship	NETX	Maddox ...	Ship
NEMC	Medusa ...	Ship	NETZ	Koka ...	Ship
NEMD	Sara Thompson	Ship	NEVB	Sunnadin ...	Ship
NEMG	Schenck ...	Ship	NEVC	Napa ...	Ship
NEMJ	Herbert ...	Ship	NEVD	O.14 ...	Ship
NEML	Branch ...	Ship	NEVK	Sciottia ...	Ship
NEMS	Evans ...	Ship	NEVL	Pinola ...	Ship
NEMT	McKean ...	Ship	NEVM	Oriole ...	Ship
NEMV	Harding ...	Ship	NEVP	Algorma ...	Ship
NEMX	Girdley ...	Ship	NEVQ	Carra Basset	Ship
NEMZ	Chew ...	Ship	NEVR	Iuka ...	Ship
NENG	Isreal ...	Ship	NEVS	Anthony ...	Ship
NENJ	Herndon ...	Ship	NEVT	Sproston ...	Ship
NENL	Heron NENL	Ship	NEVV	Rizal ...	Ship

NEVX	Machenzie ...	Ship	NHO	Illinois NHO ...	Ship
NEVZ	Renshaw ...	Ship	NHU	Roanoke NHU	Ship
NEXB	Radford ...	Ship	NHV	Iroquois NHV	Ship
NEXC	Keosauqua ...	Ship	NHW	Kittery ...	Ship
NEXF	Eagle 26 ...	Ship	NHY	Bath ...	Ship
NEXJ	O.1 ...	Ship	NHZ	Newport News	Ship
NEXL	Knudsen ...	Ship	NIB	Jarvis ...	Ship
NEXM	Eagle 28 ...	Ship	NIE	Jouett ...	Ship
NEXN	Eagle 29 ...	Ship	NIF	Chauncey ...	Ship
NEXP	Carr ...	Ship	NIH	Aylwin ...	Ship
NEXR	Mugford ...	Ship	NIJ	Balch ...	Ship
NEXS	O'Bannon ...	Ship	NIK	Benkam ...	Ship
NEXT	Hogan ...	Ship	NIL	Cassin ...	Ship
NEXV	Stansbury ...	Ship	NIM	Cumings ...	Ship
NEXX	Hopewell ...	Ship	NIN	Cushing NIM ...	Ship
NEXZ	Haraden ...	Ship	NIO	Downes ...	Ship
NEZG	Eagle 31 ...	Ship	NIP	Kansas NIO ...	Ship
NEZJ	Eagle 32 ...	Ship	NIQ	Kearsarge ...	Ship
NEZN	O.13 ...	Ship	NIR	Kentucky ...	Ship
NEZP	Tarbell ...	Ship	NIS	Duncan ...	Ship
NEZO	Delphy ...	Ship	NIT	Ericsson ...	Ship
NEZR	Gamble ...	Ship	NIU	McDougal ...	Ship
NEZS	Abbot ...	Ship	NIV	Nicholson ...	Ship
NEZT	Celmsen ...	Ship	NIX	O'Brien NIV ...	Ship
NEZV	Haatfield ...	Ship	NIBB	Parker ...	Ship
NEZX	Brooks ...	Ship	NIBC	Eagle 33 ...	Ship
NEZZ	Belknap ...	Ship	NIBD	Eagle 39 ...	Ship
NFD	Elcano NFD ...	Ship	NIBF	Eagle 34 ...	Ship
NFE	Charleston ...	Ship	NIBG	Eagle 40 ...	Ship
NFH	Smith Island ...	U.S.A.	NIBJ	Eagle 35 ...	Ship
NFI	Jacksonville ...	U.S.A.	NIBK	Eagle 41 ...	Ship
NFM	Fanning ...	Ship	NIBL	Eagle 36 ...	Ship
NFN	Cattle Point ...	U.S.A.	NIBM	Eagle 42 ...	Ship
NFR	Florida NFR ...	Ship	NIBN	Eagle 37 ...	Ship
NFS	Anacostia ...	U.S.A.	NIBP	Eagle 38 ...	Ship
NFT	New Dungeness ...	U.S.A.	NIBO	Eagle 43 ...	Ship
NFT	Port Angeles ...	U.S.A.	NIBR	Eagle 44 ...	Ship
NFU	Nantucket NFU	Ship	NIBS	Eagle 45 ...	Ship
NFX	Housatonic NFX	Ship	NIBT	Eagle 46 ...	Ship
NFZ	Rainbow ...	Ship	NIBV	Eagle 47 ...	Ship
NGB	Minneapolis ...	Ship	NIBX	Eagle 48 ...	Ship
NGC	Boston NGC ...	Ship	NIBZ	Eagle 49 ...	Ship
NGD	Galveston NGD	Ship	NICB	Eagle 50 ...	Ship
NGE	Miami ...	U.S.A.	NICC	Eagle 51 ...	Ship
NGF	Georgia NGF ...	Ship	NICD	Eagle 52 ...	Ship
NGG	Olympia NGG	Ship	NICF	Eagle 53 ...	Ship
NGH	Glacier ...	Ship	NICG	Eagle 54 ...	Ship
NGI	Chattanooga	Ship	NICJ	Eagle 55 ...	Ship
NGJ	NGI	Ship	NICK	Eagle 56 ...	Ship
NGL	Goldsborough	Ship	NICL	Eagle 57 ...	Ship
NGN	S. Petersburg ...	U.S.A.	NICM	Eagle 58 ...	Ship
NGP	Pensacola NGN	Ship	NICN	Eagle 59 ...	Ship
NGP	Beaufort NGP	Ship	NICP	Eagle 60 ...	Ship
NGQ	Quincy ...	Ship	NICQ	Cygan ...	Ship
NGR	Bridgeport ...	Ship	NICR	V-1 NICQ ...	Ship
NGS	Savannah ...	Ship	NICS	V-2 NICR ...	Ship
NGT	Mobile ...	Alaska	NICT	V-3 NICS ...	Ship
NGU	Hannibal ...	Ship	NICV	V-4 NICT ...	Ship
NGV	Hartford NGV	Ship	NICX	V-5 NICV ...	Ship
NGW	Wolverine NGW	Ship	NICZ	V-6 NICX ...	Ship
NGX	Hector NGX ...	Ship	NIDD	V-7 NICZ ...	Ship
NGY	Helena NGY ...	Ship	NIDF	V-8 ...	Ship
NGZ	Houston NGZ...	Ship	NIDG	Despatch ...	Ship
NHA	Henley ...	Ship	NIDJ	Richards ...	Ship
NHD	Monadnock ...	Ship	NIDL	V-9 ...	Ship
NHH	Ozark ...	Ship	NIFB	Mehalatos ...	Ship
NHI	Hancock ...	Ship	NIFC	Crane NIFB ...	Ship
NHL	Westport ...	U.S.A.	NIFD	Ramsay NIFC	Ship
NHN	Idaho NHN ...	Ship		Ellis ...	Ship

NIFG	Fuller ...	Ship	NILF	R.3 ...	Ship
NIFJ	Percival ...	Ship	NILG	R.4 ...	Ship
NIFL	Hamilton ...	Ship	NILJ	R.5 ...	Ship
NIFM	Howard NIFM	Ship	NILK	R.6 ...	Ship
NIFN	Thomas NIFN	Ship	NILL	R.7 ...	Ship
NIFP	Neches ...	Ship	NILM	R.8 ...	Ship
NIFQ	Pecos ...	Ship	NILN	R.9 ...	Ship
NIFR	Torpedo Test		NILP	R.10 ...	Ship
	Barge No. 1	Ship	NILQ	R.11 ...	Ship
NIFS	Torpedo Test		NILR	R.12 ...	Ship
	Barge No. 2	Ship	NILS	R.13 ...	Ship
NIFV	Cyan ...	Ship	NILT	R.14 ...	Ship
NIFX	Torpedo Test		NILV	R.21 ...	Ship
	Barge No. 3	Ship	NILX	R.22 ...	Ship
NIFZ	Torpedo Test		NILZ	R.23 ...	Ship
	Barge No. 4	Ship	NIMB	R.24 ...	Ship
NIGB	McCook ...	Ship	NIMC	R.25 ...	Ship
NIGC	McCalla ...	Ship	NIMD	R.26 ...	Ship
NIGD	Kalk ...	Ship	NIMF	R.27 ...	Ship
NIGF	Ingram Osmond	Ship	NIMG	S.1 ...	Ship
NIGG	McDermut ...	Ship	NIMJ	S.2 ...	Ship
NIGJ	Laub ...	Ship	NIMK	S.3 ...	Ship
NIGK	McLanahan ...	Ship	NIML	S.4 ...	Ship
NIGL	Edwards ...	Ship	NIMM	S.5 ...	Ship
NIGM	Greene ...	Ship	NIMN	S.6 ...	Ship
NIGN	Ballard ...	Ship	NIMP	S.7 ...	Ship
NIGP	Swasey ...	Ship	NIMQ	S.8 ...	Ship
NIGQ	John Francis		NIMR	S.9 ...	Ship
	Burns ...	Ship	NIMS	S.10 ...	Ship
NIGR	Fred J. Talbot	Ship	NIMT	S.11 ...	Ship
NIGS	Yarnall ...	Ship	NIMV	S.12 ...	Ship
NIGT	Cook NIGT	Ship	NIMX	S.13 ...	Ship
NIGV	Marinduque ...	Ship	NIMZ	S.14 ...	Ship
NIJB	Curlew NIJB	Ship	NINB	S.15 ...	Ship
NIJF	Turkey ...	Ship	NINC	S.16 ...	Ship
NIJG	Partridge NIJG	Ship	NIND	S.17 ...	Ship
NIJJ	Bobolink ...	Ship	NINF	S.18 ...	Ship
NIJK	Lark ...	Ship	NING	S.19 ...	Ship
NIJL	Pioneer NIJL	Ship	NINJ	S.20 ...	Ship
NIJM	Seagull ...	Ship	NINK	S.21 ...	Ship
NIJN	Flamingo ...	Ship	NINL	S.22 ...	Ship
NIJP	Swan NIJP	Ship	NINM	S.23 NINM	Ship
NIJQ	Whippoorwill ...	Ship	NINN	S.24 ...	Ship
NIJR	Bittern ...	Ship	NINP	S.25 ...	Ship
NIJS	Sanderling ...	Ship	NINQ	S.26 ...	Ship
NIJT	Discoverer NIJT	Ship	NINR	S.27 ...	Ship
NIJV	Chewink ...	Ship	NINS	S.28 ...	Ship
NIJX	Gannett ...	Ship	NINT	S.29 ...	Ship
NIKB	Mallard ...	Ship	NINV	S.30 ...	Ship
NIKC	Ortolan ...	Ship	NINX	S.31 ...	Ship
NIKD	Peacock NIKD	Ship	NINZ	S.32 ...	Ship
NIKF	Pigeon NIKF	Ship	NIPB	S.33 ...	Ship
NIKG	Redwing ...	Ship	NIPC	S.34 ...	Ship
NIKK	Sandpiper ...	Ship	NIPD	S.35 ...	Ship
NIKL	Vireo ...	Ship	NIPF	S.36 ...	Ship
NIKM	Warbler NIKM	Ship	NIPG	S.37 ...	Ship
NIKN	Willet ...	Ship	NIPJ	S.38 ...	Ship
NIKP	Woodcock ...	Ship	NIPK	S.39 ...	Ship
NIKQ	Quail ...	Ship	NIPL	S.40 ...	Ship
NIKR	Eider NIKR	Ship	NIPM	S.41 ...	Ship
NIKS	Thrush ...	Ship	NIPN	S.42 ...	Ship
NIKT	Tern ...	Ship	NIPP	S.43 ...	Ship
NIKV	Cormorant		NIPQ	S.44 ...	Ship
	NIKV ...	Ship	NIPR	S.45 ...	Ship
NIKX	Grebe ...	Ship	NIPS	S.46 ...	Ship
NIKZ	Raven NIKZ	Ship	NIPT	S.47 ...	Ship
NILB	T-1 ...	Ship	NIPV	S.48 ...	Ship
NILC	R-1 ...	Ship	NIPX	S.49 ...	Ship
NILD	R.2 ...	Ship	NIPZ	S.50 ...	Ship

NIQB	Sub-Chaser 425	Ship	NJR	Mars NJR	...	Ship
NIQD	Sub-Chaser 427	Ship	NJS	Frederick	...	Ship
NIQK	S.51 ...	Ship	NJU	Mayrant	...	Ship
NIQL	Sub-Chaser 432	Ship	NJV	Mayflower	...	Ship
NIQP	Johansson	...	NJW	McCall	...	Ship
NIQT	Sub-Chaser 439	Ship	NJX	Willoughby	...	Ship
NIQV	Sub-Chaser 440	Ship	NJY	Port Arthur	...	U.S.A.
NIQX	Sub-Chaser 441	Ship	NJZ	Michigan	...	Ship
NIRB	Sub-Chaser 443	Ship	NKA	Meville	...	Ship
NIRC	Sub-Chaser 444	Ship	NKB	Galveston	...	U.S.A.
NIRL	Whitney	...	NKC	Navassa Islands	...	Windward
NIRM	Holland	...		W.I.	...	Pass
NIRM	Wright	...	NKD	Minnesota	...	Ship
NIRP	Iowa NIRP	...	NKE	Mississippi	...	Ship
NIRO	Massachusetts	...	NKG	S.P.1116	...	Ship
NIRR	Marblehead	...	NKK	Mercy	...	Ship
NIRS	Indiana NIRS	Ship	NKM	Missoula	...	Ship
NIRT	Raleigh NIRT	Ship	NKN	Monterey	...	Ship
NIRV	Concord NIRV	Ship	NKO	Wilkes	...	Ship
NIRX	Canopus	...	NKR	Roewan	...	Ship
NIRZ	Denebola	...	NKS	Sampson	...	Ship
NISB	Tingard	...	NKT	Schley	...	Ship
NISC	Klingelhoefer	...	NKU	Shaw	...	Ship
NISD	Boyce	...	NKV	Tucker	...	Ship
NISG	South Dakota	...	NKW	Wadsworth	...	Ship
NISJ	Montana	...	NKX	Wainwright	...	Ship
NISK	North Carolina	Ship	NKZ	Navajo	...	Ship
NISL	Omaha	...	NLA	Nantucket Shoals	...	U.S.A.
NISM	Milwaukee	...		Lightship	...	U.S.A.
NISN	Cincinnati	...	NLA	Light Vessel	...	U.S.A.
NISP	Detroit	...		No. 85	...	U.S.A.
NISQ	Richmond NISQ	Ship	NLB	Diamond Shoal	...	U.S.A.
NISR	Trenton	...		Lightship	...	U.S.A.
NISS	Memphis	...	NLC	Light Vessel	...	U.S.A.
NIST	Tulsa NIST	...		No. 94	...	U.S.A.
NISV	Chaumont NISV	Ship	NLC	Frying Pan	...	U.S.A.
NISX	Argonne	...		Shoals L'ship	...	U.S.A.
NISZ	Bayspring NISZ	Ship	NLE	Commodore	...	Ship
NITB	Taylor NITB	...		NLE	...	Ship
NITC	Tampa NITC	...	NLF	Kokui	...	Ship
NITF	Haida	...	NLG	Point Reyes	...	U.S.A.
NITK	Larsen	...	NLH	Point Montara	...	U.S.A.
NITQ	Light Vessel	...	NLJ	Pathfinder NLJ	...	Ship
	No. 72	...	NLK	Bache	...	Ship
NITQ	Diamond Shoal	...	NLL	Columbine	...	Ship
	Light Vessel	...	NLM	Cypress	...	Ship
NITR	Relief Light	...	NLP	Light Vessel	...	U.S.A.
	Vessel No. 78	...		No. 81	...	U.S.A.
NITS	Relief	...	NLS	Light Vessel	...	U.S.A.
	Vessel No. 90	...		No. 68	...	U.S.A.
NITV	Cahokia	...	NLT	Orchid	...	Ship
NITX	Kickapoo	...	NLU	Manzanita	...	Ship
NIVD	Modoc	...	NLV	Sequoia	...	Ship
NIVP	Mascoutin	...	NLW	Cedar	...	Ship
NIVR	Tamaroa	...	NLY	Topeka	...	Ship
NIXB	Mojave	...	NMA	Nebraska NMA	...	Ship
NIXG	Smith	...	NMB	Maniti	...	Cuba
NIZD	Oveson	...	NMC	Vestal	...	Ship
NIZJ	Shawnee	...	NMD	Point Hueneme	...	U.S.A.
NJA	Winslow	...	NME	New Hampshire	...	Ship
NJB	Louisiana NJB	Ship		NME	...	Ship
NJC	Decatur NJC	...	NMF	New Jersey NMF	...	Ship
NJD	Allen NJD	...	NMG	New Orleans	...	Ship
NJE	Conyngham	...		NMG	...	Ship
NJF	Davis	...	NMH	Newport NMH	...	Ship
NJI	S.P.951	...	NMK	Aroostook	...	Ship
NJJ	Wenonah	...	NML	Shawmut	...	Ship
NJL	Maine NJL	...	NMN	Charlotte	...	Ship
NJM	Yacona	...	NMO	North Dakota	...	Ship

NMS	Neptune* NMS	Ship	NOPE	Sub-Chaser 223	Ship
NMW	Ohio NMW ...	Ship	NOPG	Sub-Chaser 224	Ship
NMZ	Oregon NMZ ...	Ship	NOPN	Sub-Chaser 229	Ship
NNA	Brutous ...	Ship	NOPO	Sub-Chaser 231	Ship
NNB	Jason ...	Ship	NOPR	Sub-Chaser 232	Ship
NNC	Langley ...	Ship	NOPZ	Sub-Chaser 237	Ship
NND	Kanawha NND	Ship	NOOQ	Sub-Chaser 251	Ship
NNE	Maumee ...	Ship	NOOS	Sub-Chaser 253	Ship
NNF	Nereus ...	Ship	NORJ	Sub-Chaser 263	Ship
NNG	Proteus NNG ...	Ship	NORK	Sub-Chaser 264	Ship
NNH	Leonidas ...	Ship	NORR	Sub-Chasee 270	Ship
NNI	S. Croix ...	Virgin Is.	NORS	Sub-Chaser 271	Ship
NNK	Nanshan ...	Ship	NORV	Sub-Chaser 273	Ship
NNL	Coco Solo ...	Panama	NOSB	Sub-Chaser 276	Ship
NNM	Saturn ...	Ship	NOSC	Sub-Chaser 277	Ship
NNO	Carola IV ...	Ship	NOSD	Sub-Chaser 278	Ship
NNP	Kivasind ...	Ship	NOSL	Sub-Chaser 283	Ship
NNQ	Corona NNQ ...	Ship	NOSM	Sub-Chaser 284	Ship
NNT	Cape Mala ...	Panama	NOSO	Sub-Chaser 287	Ship
NNW	La Palma ...	Panama	NOTB	Sub-Chaser 294	Ship
NNX	Undaunted NNX	Ship	NOTG	Sub-Chaser 298	Ship
NNZ	Buffalo ...	U.S.A.	NOTI	Sub-Chaser 299	Ship
NOA	Oceola ...	Ship	NOTN	Sub-Chaser 303	Ship
NOB	Aberenda ...	Ship	NOTO	Sub-Chaser 305	Ship
NOD	Cuyama ...	Ship	NOTR	Sub-Chaser 306	Ship
NOE	Penobscot NOE	Ship	NOTT	Sub-Chaser 308	Ship
NOG	Paducah ...	Ship	NOTX	Sub-Chaser 310	Ship
NOH	Henderson ...	Ship	NOVC	Sub-Chaser 320	Ship
NOI	Bridge ...	Ship	NOVL	Sub-Chaser 326	Ship
NOJ	Panther ...	Ship	NOVN	Sub-Chaser 328	Ship
NOK	Patterson ...	Ship	NOVO	Sub-Chaser 330	Ship
NOL	Patapsco ...	Ship	NOVS	Sub-Chaser 332	Ship
NOM	Patuxent ...	Ship	NOXF	Sub-Chaser 340	Ship
NON	Paulding ...	Ship	NOXG	Sub-Chaser 341	Ship
NOO	Porter ...	Ship	NOXS	Sub-Chaser 353	Ship
NOT	Pittsburgh	Ship	NOZC	Sub-Chaser 408	Ship
	NOT ...	Ship	NOZD	Sub-Chaser 409	Ship
NOW	Peoria ...	Ship	NOZI	Sub-Chaser 412	Ship
NOX	Perkins ...	Ship	NOZK	Sub-Chaser 413	Ship
NOBO	Sub-Chaser 23	Ship	NOZR	Sub-Chaser 419	Ship
NODF	Sub-Chaser 57	Ship	NOZZ	Sub-Chaser 424	Ship
NODM	Sub-Chaser 62	Ship	NPA	Cordova ...	Alaska
NODN	Sub-Chaser 63	Ship	NPB	Sitka ...	Alaska
NODP	Sub-Chaser 64	Ship	NPC	Puget Sound ...	U.S.A.
NODR	Sub-Chaser 69	Ship	NPD	Slip Point ...	U.S.A.
NPDT	Sub-Chaser 71	Ship	NPD	Tatoosh Island	U.S.A.
NOFX	Sub-Chaser 93	Ship	NPE	North Head ...	U.S.A.
NOGJ	Sub-Chaser 100	Ship	NPE	Ocean Park ...	U.S.A.
NOGL	Sub-Chaser 102	Ship	NPE	Fort Stevens ...	U.S.A.
NOGN	Sub-Chaser 104	Ship	NPF	Marshfield ...	U.S.A.
NOGO	Sub-Chaser 106	Ship	NPF	Empire ...	U.S.A.
NOJK	Sub-Chaser 119	Ship	NPF	Cape Blanco ...	U.S.A.
NOJM	Sub-Chaser 121	Ship	NPG	San Francisco	U.S.A.
NOKN	Sub-Chaser 143	Ship	NPH	San Francisco	U.S.A.
NOKO	Sub-Chaser 145	Ship	NPI	Farallon Island	U.S.A.
NOKR	Sub-Chaser 147	Ship	NPI	Balboa ...	Canal Zone
NOLC	Sub-Chaser 154	Ship	NPI	Shanghai ...	China
NOLF	Sub-Chaser 156	Ship	NPK	Port Arguello	U.S.A.
NOLK	Sub-Chaser 159	Ship	NPL	Point Loma ...	U.S.A.
NOLR	Sub-Chaser 177	Ship	NPL	San Diego ...	U.S.A.
NOMD	Sub-Chaser 185	Ship	NPL	Imperial Beach	U.S.A.
NOMF	Sub-Chaser 186	Ship	NPM	Pearl Harbour	Hawaiian Islands
NOMJ	Sub-Chaser 188	Ship			
NOML	Sub-Chaser 190	Ship	NPM	Honolulu ...	Hawaiian Islands
NOMM	Sub-Chaser 191	Ship			
NOMN	Sub-Chaser 192	Ship	NPN	Guam ...	Marianne Islands
NOMR	Sub-Chaser 195	Ship			
NONN	Sub-Chaser 210	Ship	NPO	Cauite ...	Philippine Islands
NONS	Sub-Chaser 214	Ship			

NPP	Peking ...	China	NTL	Sylph NTL ...	Ship
NPO	St. Paul ...	Alaska	NTN	Fairfax ...	Ship
NPR	Dutch Harbour ...	Alaska	NTO	Mohave ...	Ship
NPS	Kodiak ...	U.S.A.	NTP	Salem ...	Ship
NPT	Olongapo ...	Philippine Islands	NTQ	S. Francisco	
				NTQ	Ship
NPU	Tu Tuila ...	Samoa Is.	NTR	Rochester NTR	Ship
NPV	Seward ...	Alaska	NTT	Scorpion ...	Ship
NPW	Eureka... ..	U.S.A.	NTW	Appledore Island	U.S.A.
NPX	Point Fermin ...	U.S.A.	NTX	Rhode Island	
NPY	S. Pedro ...	U.S.A.		NTX	Ship
NQF	St. George ...	Alaska	NTY	Manitowoc ...	U.S.A.
NQK	Pompey ...	Ship	NTZ	Roe ...	Ship
NQK	Potomac NQK	Ship	NUA	Tacoma NUA	Ship
NQL	Machias ...	Ship	NUB	Manistique ...	U.S.A.
NQM	Prairie ...	Ship	NUC	Tallahassee ...	Ship
NQO	Monocacy ...	Ship	NUD	Mackinac Island	U.S.A.
NQR	Prometheus NQR	Ship	NUG	Eagle Harbour	U.S.A.
NQS	Palos ...	Ship	NUI	Terry ...	Ship
NQT	Pampanga ...	Ship	NUK	Milwaukee ...	U.S.A.
NQU	Surveyor ...	Ship	NUN	Tonopah ...	Ship
NQV	Sacramento NQV	Ship	NUQ	Trippe ...	Ship
NQZ	Quiros ...	Ship	NUR	Chicago ...	U.S.A.
NRA	Algonquin NRA	Ship	NUV	Sebago ...	Ship
NRB	Bear ...	Ship	NUW	Soapstone Point	Alaska
NRC	Morrill ...	Ship	NUX	Duluth ...	U.S.A.
NRE	Seneca ...	Ship	NUZ	Astoria... ..	U.S.A.
NRF	Snoohomish ...	Ship	NUBB	S.P.43 ...	Ship
NRG	Gresham ...	Ship	NUBC	S.P.909 ...	Ship
NRH	Cleveland ...	U.S.A.	NUBK	S.P.54 ...	Ship
NRJ	Ossipee ...	Ship	NUBR	S.P.3297 ...	Ship
NRK	Puerto Obaldia	Panama	NUBS	S.P.726 ...	Ship
NRM	Cape Hinchin-Brook ...	Alaska	NUBT	S.P.522 ...	Ship
			NUBZ	S.P.340 ...	Ship
NRN	Manning ...	Ship	NUCF	Lilac ...	Ship
NRO	Onondaga NRO	Ship	NUCG	S.P.573 ...	Ship
NRQ	Detroit... ..	U.S.A.	NUCJ	S.P.1234 ...	Ship
NRK	Pamlico ...	Ship	NUCP	S.P.765 ...	Ship
NRS	Seminole NRS	Ship	NUCS	S.P.642 ...	Ship
NRT	Little ...	Ship	NUCT	S.P.265 ...	Ship
NRU	Acusanet ...	Ship	NUCX	S.P.214 ...	Ship
NRV	Tallapoosa ...	Ship	NUCZ	S.P.249 ...	Ship
NRW	Commanche		NUDF	S.P.179 ...	Ship
	NRW ...	Ship	NUDG	Ranger NUDG	Ship
NRX	Unalga ...	Ship	NUDK	S.P.2373 ...	Ship
NRV	Yamacraw ...	Ship	NUDR	S.P.707 ...	Ship
NSC	Port-au-Prince	Haiti	NUFB	Mohawk ...	Ship
NSD	Cape May ...	U.S.A.	NUFG	S.P.399 ...	Ship
NSD	Bethany Beach	U.S.A.	NUFL	S.P.838 ...	Ship
NSE	Tennessee NSE	Ship	NUFM	Sunflower ...	Ship
NSH	Manley... ..	Ship	NUFN	S.P.1149 ...	Ship
NSI	Caldwell ...	Ship	NUFZ	S.P.185 ...	Ship
NSL	Fire Island		NUGB	S.P.3218 ...	Ship
	Light Vessel	U.S.A.	NUGG	Natoma ...	Ship
NSM	Alpena ...	U.S.A.	NUGJ	Alameda NUGJ	Ship
NSN	Conner ...	Ship	NUGL	Laramie ...	Ship
NSO	Cape Henlopen	U.S.A.	NUMG	Mattole ...	Ship
NSR	Nasser ...	Sudan	NUGN	Patoka ...	Ship
NSS	Annapolis ...	U.S.A.	NUGP	Ramapo ...	Ship
NST	Solace ...	Ship	NUGQ	Rapidan NUGQ	Ship
NSU	Vixen ...	Ship	NUGR	Salinas ...	Ship
NSW	South Carolina	Ship	NUGS	Sapelo ...	Ship
NSX	Huron NSX ...	Ship	NUGT	Sepulga ...	Ship
NSZ	Cumberland		NUGV	Tippecanoe ...	Ship
	NSZ ...	Ship	NUGX	Trinity ...	Ship
NTB	Sterrett ...	Ship	NUJD	Abel P. Upshur	Ship
NTD	S.P.1161 ...	Ship	NUJF	Hunt ...	Ship
NTF	S. Louis NTF	Ship	NUJG	Geo. E. Badger	Ship
NTG	Sonoma NTG	Ship	NUJJ	Smith Thompson	Ship

NUJK	Barker ...	Ship	NUPJ	Pequot NUPJ	Ship
NUJL	Tracy ...	Ship	NUPK	Coghlan ...	Ship
NUJM	James K. Paulding ...	Ship	NUPL	Sicard ...	Ship
NUJN	Overton ...	Ship	NUPM	Edsall ...	Ship
NUJP	Sturtevant ...	Ship	NUPN	Bulmer ...	Ship
NUJQ	Henshaw ...	Ship	NUPP	Sirius NUPP ...	Ship
NUJR	Meyer ...	Ship	NUPR	Charles Ausburne	Ship
NUJS	Doyen ...	Ship	NUPS	Bruce NUPS ...	Ship
NUJT	Vallette (La) ...	Ship	NUPT	MacLeish ...	Ship
NUJV	Shirk ...	Ship	NUPV	Pruitt ...	Ship
NUJX	Kidder ...	Ship	NUPX	Simpson ...	Ship
NUJZ	Selfridge ...	Ship	NUPZ	McCormack ...	Ship
NUKB	Robert Smith ...	Ship	NUQB	Pope ...	Ship
NUKC	Wasmuth ...	Ship	NUQC	Osborne NUQC	Ship
NUKD	Hulbert ...	Ship	NUQD	Peary ...	Ship
NUKF	Noa ...	Ship	NUQF	Goff ...	Ship
NULJ	Welborn C. Wood	Ship	NUQG	Pillsbury ...	Ship
NULK	Alden ...	Ship	NUQK	Truxton ...	Ship
NULL	Borie ...	Ship	NUQK	Ford NUQK ...	Ship
NULM	Kane ...	Ship	NUQL	Bainbridge ...	Ship
NULN	Childs ...	Ship	NUQM	Hopkins ...	Ship
NULP	King ...	Ship	NUQN	Paul Jones ...	Ship
NULQ	Sands ...	Ship	NUQP	Barry ...	Ship
NULR	Sinclair ...	Ship	NUQQ	Lawrence ...	Ship
NULS	McCawley ...	Ship	NUQR	MacDonough ...	Ship
NULT	Moody ...	Ship	NUQS	Perry ...	Ship
NULV	Sharkey ...	Ship	NUQT	Hull ...	Ship
NULX	Toucey... ..	Ship	NUQV	Decatur NUQV	Ship
NULZ	Breck ...	Ship	NUQX	Sumner ...	Ship
NUMB	Zellin ...	Ship	NUQZ	Corry ...	Ship
NUMC	Yarborough	Ship	NURB	Mahanna NURB	Ship
	NUMC ...	Ship	NURC	Melvin ...	Ship
NUMF	Wood ...	Ship	NURD	Spica ...	Ship
NUMG	Marcus ...	Ship	NURF	Procyon NURF	Ship
NUMJ	Mervine ...	Ship	NURG	Rigel NURG ...	Ship
NUMK	Chase ...	Ship	NURJ	Altair NURJ ...	Ship
NUML	Mullany ...	Ship	NURK	Eider NURK ...	Ship
NUMM	Litchfield ...	Ship	NURX	Humphreys ...	Ship
NUMN	Zane ...	Ship	NVD	Juneau... ..	Alaska
NUMP	Trever ...	Ship	NVE	Utah NVE ...	Ship
NUMG	William B. Preston ...	Ship	NVF	Uncas NVF ...	Ship
	S. P. 681 ...	Ship	NVH	Ketchikan ...	Alaska
NUMS	Harbour-Tug	Ship	NVJ	Wompatuck ...	Ship
NUMX	No. 61 ...	Ship	NVK	Vermont NVK	Ship
NUMZ	Kankakee ...	Ship	NVL	Seattle ...	U.S.A.
NUNB	Yocona ...	Ship	NVP	Villalobos ...	Ship
NUNC	Lamson ...	Ship	NVR	Virginia NVR	Ship
NUND	Dale ...	Ship	NVS	Farragut ...	Ship
NUNF	Flusser ...	Ship	NVT	Vulcan ...	Ship
NUNG	Preble ...	Ship	NVU	Bagley ...	Ship
	United States	Ship	NVV	Barney... ..	Ship
	NUNG ...	Ship	NVW	Biddle ...	Ship
NUNJ	Preston ...	Ship	NVZ	Dahlgren ...	Ship
NUNK	Reid ...	Ship	NWB	Delong ...	Ship
NUNL	Whipple ...	Ship	NWC	Dupont ...	Ship
NUNM	Worden ...	Ship	NWD	Warrington ...	Ship
NUNN	Stewart ...	Ship	NWE	Washington	Ship
NUNR	Dobbin ...	Ship		NWE ...	Ship
NUNS	Williamson ...	Ship	NWF	Foote ...	Ship
NUNT	Reuben James	Ship	NWG	Huntington ...	Ship
NUNV	Isherwood ...	Ship	NWH	Wheeling ...	Ship
NUNX	Case ...	Ship	NWJ	Fox ...	Ship
NUNZ	Nicholas ...	Ship	NWK	Wilmington ...	Ship
NUPC	John D. Edwards	Ship	NWL	Walke ...	Ship
NUPD	Parrott ...	Ship	NWM	Wisconsin ...	Ship
NUPF	Lardner ...	Ship	NWQ	Wyoming ...	Ship
NUPG	Putnam NUPG	Ship	NWS	Morris ...	Ship
			NWT	Rodgers ...	Ship
			NWV	Somers ...	Ship

NWX	Thornton ...	Ship	OAT	Trujolli ...	Peru
NWY	Tingey ...	Ship	OAU	Encanto ...	Colombia
NXA	Chatham ...	U.S.A.	OAY	Iquitos ...	Peru
NXN	C.4 ...	Ship	OAZ	Lima San	
NXP	D.1 ...	Ship		Christobal ...	Peru
NXQ	D.2 ...	Ship	OCA	Moora ...	Ship
NXR	D.3 ...	Ship	OCB	Luchana ...	Ship
NXS	E.1 ...	Ship	OCC	Jeseric ...	Ship
NXT	E.2 ...	Ship	OCD	Duns Law ...	Ship
NXU	Azalesa ...	Ship	OCF	Tempus ...	Ship
NXV	F2 NXV ...	Ship	OCG	Dumbridge ...	Ship
NXW	F.3 ...	Ship	OCH	Cheniston ...	Ship
NXX	Tulip ...	Ship	OCH	Huallaga ...	Ship
NXZ	G.2 ...	Ship	OCI	Maurcen ...	Ship
NYA	G.3 ...	Ship	OCK	Novo ...	Ship
NYB	G.4 ...	Ship	OCL	Pangbourne OCL	Ship
NYD	H.2 NYD ...	Ship	OCM	Mahratta ...	Ship
NYE	H.3 NYE ...	Ship	OCM	Mantaro ...	Ship
NYF	K.1 ...	Ship	OCN	Phoebe ...	Ship
NYG	K.2 ...	Ship	OCO	Pundit ...	Ship
NYH	K.3 ...	Ship	OCQ	Tosto OCQ ...	Ship
NYI	K.4 ...	Ship	OCR	Urubamba ...	Ship
NYJ	K.5 ...	Ship	OCS	Rondo OCS ...	Ship
NYK	K.6 ...	Ship	OCU	Lyntown ...	Ship
NYL	K.7 ...	Ship	OCU	Ucayali ...	Ship
NYM	K.8 ...	Ship	OCV	Winkfield ...	Ship
NYN	L.1 ...	Ship	OCW	Taransay ...	Ship
NYO	L.2 ...	Ship	OCY	Gracefield ...	Ship
NYP	L.3 ...	Ship	OCZ	Promus ...	Ship
NYQ	L.4 ...	Ship	ODA	Glen Head ...	Ship
NYR	L.5 ...	Ship	ODB	Peebles ...	Ship
NYR	Nyala ...	Sudan	ODC	Sotero ...	Ship
NYS	L.6 ...	Ship	ODD	Baron Douglas ...	Ship
NYT	L.7 ...	Ship	ODE	Dallington ...	Ship
NYU	L.8 ...	Ship	ODF	Indianola ...	Ship
NYV	L.9 ...	Ship	ODG	Inkula ...	Ship
NYW	L.10 ...	Ship	ODH	Neebing ...	Ship
NYX	L.11 ...	Ship	ODK	Bury ...	Ship
NYZ	M.1 ...	Ship	ODL	Kolpino ...	Ship
NZC	Bushnell ...	Ship	ODM	Kotka ...	Ship
NZD	Fulton NZD ...	Ship	ODN	Kovno ...	Ship
NZE	N.1 ...	Ship	ODO	Livorno ...	Ship
NZF	N.2 ...	Ship	ODP	Narva ...	Ship
NZG	N.3 ...	Ship	ODT	Borodino ...	Ship
NZH	N.4 ...	Ship	ODV	Claro ...	Ship
NZI	N.5 ...	Ship	ODX	Gourko ...	Ship
NZJ	N.6 ...	Ship	ODZ	Stockport ...	Ship
NZK	N.7 ...	Ship	OEC	Grantley ...	Ship
NZP	Bolinas ...	U.S.A.	OED	Pensacola OED	Ship
NZO	Mayflower ...	Ship	OEE	Venice ...	Ship
NZR	Cayey ...	Porto Rico	OEF	Trevider ...	Ship
NZT	Grand Maris ...	U.S.A.	OEG	Fernandina, ...	Ship
NZT	Whitefish Point ...	U.S.A.	OEI	Norton ...	Ship
NZU	Detour Point ...	U.S.A.	OEJ	Wraymore ...	Ship
NZV	Folly Island ...	U.S.A.	OEK	Vedamore ...	Ship
NZW	North Island ...	U.S.A.	OEL	Belgravian ...	Ship
NZX	L. Roscoe ...	Ship	OER	Bosnian ...	Ship
NZZ	Zizania... ...	Ship	OES	Grellis ...	Ship
OAB	Cachendo ...	Peru	OET	Akera ...	Ship
OAC	Chala ...	Peru	OEU	Brazilier ...	Ship
OAD	PuertoMaldonado ...	Peru	OEZ	Gasconier ...	Ship
OAE	Puerto Bermudez ...	Peru	OFA	Burgondier ...	Ship
OAF	Fronton ...	Peru	OFB	Absia ...	Ship
OAG	Eten ...	Peru	OFB	Antonio OFB	Ship
OAL	Ilo ...	Peru	OFF	Taxandrier ...	Ship
OAM	Masisea ...	Peru	OFG	Crenatula ...	Ship
OAQ	Orellana ...	Peru	OFH	Caprella ...	Ship
OAP	Pisco ...	Peru	OFI	Cliona ...	Ship
OAQ	Leticia ...	Peru	OFJ	Chiton ...	Ship

OFK	British Sailor ...	Ship	OHS	Sirius OHS ...	Ship
OFL	Corbis ...	Ship	OHT	Silkeberg ...	Ship
OFM	Conia ...	Ship	OHU	Vega OHU ...	Ship
OFN	Warnizam ...	Ship	OHU	Danemark ...	Ship
OFO	Sunningdale ...	Ship	OHW	Frieda OHW ...	Ship
OFP	Edendale ...	Ship	OHX	Knud II ...	Ship
OFR	Flamma ...	Ship	OHY	Venus OHY ...	Ship
OFS	Lucient ...	Ship	OHZ	Bremersvold ...	Ship
OFT	Airedale ...	Ship	OHAA	Orkild ...	Ship
OFV	Loos ...	Ship	OHBA	Jomsborg ...	Ship
OFX	Siptah ...	Ship	OHCA	Amalienborg ...	Ship
OGA	Yokohama ...	Ship	OHDA	Kronpins	
OGC	Nordfarer ...	Ship		Frederik ...	Ship
OGD	Helge ...	Ship	OHEA	Orion OHEA ...	Ship
OGE	Em. Z. Svitzer ...	Ship	OHFA	Rödfaxe ...	Ship
OGF	Mexico OGF ...	Ship	OHHA	Elie ...	Ship
OGI	Tranquebar ...	Ship	OHIA	Aladdin OHIA ...	Ship
OGJ	Hvidehavet ...	Ship	OHJA	Frederiksborg ...	Ship
OGK	Marie Mærsk ...	Ship	OHKA	Oluf Mærsk ...	Ship
OGL	Gudrun Mærsk ...	Ship	OHLA	Dansborg ...	Ship
OGM	Moskov ...	Ship	OHNA	Helmer Morch ...	Ship
OGN	Danebod ...	Ship	OHOA	Kotonia ...	Ship
OGO	Stegelborg ...	Ship	OHPA	Albistan OHPA ...	Ship
OGP	Kattegat ...	Ship	OHSA	Nevada OHSA ...	Ship
OGQ	Danebrog OGQ ...	Ship	OHTA	Abalon OHTA ...	Ship
OGS	Dania ...	Ship	OHVA	Olaf L. Kongsted ...	Ship
OGT	Strandholm ...	Ship	OHZA	Atlantterhavet ...	Ship
OGU	Uffe ...	Ship	OIA	Alfred Hage ...	Ship
OGV	Nidaros OGV ...	Ship	OIB	Christiansburg ...	Ship
OGW	T. M. Werner ...	Ship	OIC	Oregon ...	Ship
OGX	Alexandra OGX ...	Ship	OID	Arabien ...	Ship
OGY	Dagmar ...	Ship	OIE	Natal ...	Ship
OGZ	Newa ...	Ship	OIF	Arkansas OIF ...	Ship
OGAA	L. P. Holmblad ...	Ship	OIG	Pacific OIG ...	Ship
OGBA	Indien ...	Ship	OIH	Atlantic OIH ...	Ship
OGCA	Osten ...	Ship	OII	Estonia ...	Ship
OGDA	Hammershus ...	Ship	OIJ	Polonia ...	Ship
OGEA	Brattingborg ...	Ship	OIK	Lituanian ...	Ship
OGFA	Börglum ...	Ship	OIL	Normannia OIL ...	Ship
OGGA	Kronborg ...	Ship	OIM	Orneborg ...	Ship
DGHA	Jungshoued ...	Ship	OIN	Niels R. Finsen ...	Ship
OGIA	Jan ...	Ship	OIQ	Pennsylvania	
OGJA	Polaris ...	Ship		OIQ	Ship
OGKA	Kirsten Mærsk ...	Ship	OIR	Russ OIR ...	Ship
OGLA	Rhodesia ...	Ship	OIS	Virginia OIS ...	Ship
OGNA	N. F. Hoffding ...	Ship	OIT	Gronsdun OIT ...	Ship
OGQA	Kong Haakon ...	Ship	OIU	Skanderborg ...	Ship
OGVA	Delagoa ...	Ship	OIV	Sonderborg ...	Ship
OGWA	Kina ...	Ship	OIW	Gudrun ...	Ship
OGXA	Transvaal ...	Ship	OIX	Berlin OIX ...	Ship
OHA	Viborg ...	Ship	OIY	Jelling ...	Ship
OHB	I.D.S. Adolph ...	Ship	OIZ	Fredensbro ...	Ship
OHC	Aggersund ...	Ship	OIAA	Nordstjernen ...	Ship
OHD	Sydhavet ...	Ship	OIAC	Bintang ...	Ship
OHD	Deutsch Alten- burg ...	Germany	OIAD	Ingeborg S. ...	Ship
OHE	Russ OHE ...	Ship	OIAG	Geir ...	Ship
OHF	Falkland ...	Ship	OICA	Gulfaxe ...	Ship
OHG	Bothal ...	Ship	OIEA	Malaya OIEA ...	Ship
OHH	Aalborg ...	Ship	OIKA	Erik II ...	Ship
OHI	Lifland ...	Ship	OILA	Birte ...	Ship
OHJ	Vidar OHJ ...	Ship	OIMA	Jakob Mærsk ...	Ship
OHK	Tjaldur ...	Ship	OIVA	Petrolea ...	Ship
OHL	Flora OHL ...	Ship	OIYA	Dronning Maud ...	Ship
OHM	Polarhavet ...	Ship	OJA	Helsingfors ...	Finland
OHN	Josey ...	Ship	OJB	Wiborg ...	Finland
OHP	Wm. Th. Malling ...	Ship	OJC	Kotka ...	Finland
OHQ	Wien ...	Ship	OJD	Hango ...	Finland
OHR	Bretland ...	Ship	OJE	Abo ...	Finland
			OJF	Mariehamn ...	Finland

OJG	Waasa ...	Finland	ONC	Caledonier ...	Ship
OJJ	Aransgrund ...	Ship	OND	Leopold II ...	Ship
OJK	Sampo ...	Ship	ONE	Avenir (L') ...	Ship
OJL	Tarmo ...	Ship	ONF	Adolf Deppe ...	Ship
OJM	Ariadne OJM ...	Ship	ONG	Gallier ...	Ship
OJN	Arcturus OJN ...	Ship	ONH	Edea ...	Ship
OJO	Astrea ...	Ship	ONI	India ...	Ship
OJP	Valtamer ...	Ship	ONJ	Jan Breydel ...	Ship
OJR	Sicilia OJR ...	Ship	ONK	Albert Killing ...	Ship
OJS	Helios OJS ...	Ship	ONL	General Leman ...	Ship
OJT	Argo OJT ...	Ship	ONM	Armistice ...	Ship
OJU	Regulus OJU ...	Ship	ONN	Nipponier ...	Ship
OJV	Hebe ...	Ship	ONO	Londonier ...	Ship
OJW	Corona OJW ...	Ship	ONP	Patagonier ...	Ship
OJX	Imatra ...	Ship	ONQ	Algerier ...	Ship
OJY	Baltic OJY ...	Ship	ONR	Rogier ...	Ship
OJZ	Suomen Poika ...	Ship	ONS	Sicilier ...	Ship
OJAB	Suomen Nelto... ..	Ship	ONT	Tigris ...	Ship
OKA	Legie ...	Ship	ONU	Australier ONU	Ship
OLB	Nieuwe Maas ...	Ship	ONW	Venetier ...	Ship
OLC	Koudekerk ...	Ship	ONX	Clara Blumenfeld	Ship
OLD	Hoogkerk ...	Ship	ONY	Baron Baeyens	Ship
OLE	Orania OLE ...	Ship	ONZ	Joachim Zelck	Ship
OLF	Flandria ...	Ship	ONZ	Jan Van	
OLG	Admiral De			Rijswijck ...	Ship
	Ruyter ...	Ship	ONEA	Sonnenfels ...	Ship
OLH	Blitar ...	Ship	ONGA	Greiffenfels ...	Ship
OLI	Modjokerto ...	Ship	ONHA	Ehrenfels ONHA	Ship
OLJ	Kedoe ...	Ship	ONIA	Itauri ...	Ship
OLK	Kertosond ...	Ship	ONIA	Carlier ...	Ship
OLM	Siantar... ..	Ship	ONKA	Marksburg ...	Ship
OLO	Anjer ...	Ship	ONVA	Anversville ...	Ship
OLP	Terimai ...	Ship	ONXA	Alexandre ...	Ship
OLQ	Slamat ...	Ship	ONYA	Sydney ONYA	Ship
OLS	Schouwen ...	Ship	OOB	Belgier ...	Ship
OLT	Texel ...	Ship	OOO	Colombier ...	Ship
OLU	Besoeki ...	Ship	OOE	Eglantier ...	Ship
OLV	Vlieland ...	Ship	OOF	Comte De	
OLX	Witte Zee OLX	Ship		Flandre ...	Ship
OLY	Derindje ...	Ship	OOH	Adelina Hugo	
OLZ	Pontos ...	Ship		Stinnes ...	Ship
OMA	Scopas ...	Ship	OOI	Kalier ...	Ship
OMB	Silvanus ...	Ship	OOJ	Douro ...	Ship
OMC	Semiramis OMC	Ship	OOL	Emmanuel Nobel	Ship
OMD	S. Jansland ...	Ship	OOM	Remier... ..	Ship
OME	Schieland ...	Ship	OOP	Princesse	
OMF	S. Annaland ...	Ship		Clémentine	
OMG	Zuid-Holland ...	Ship		OOP ...	Ship
OMH	Aludra ...	Ship	OOQ	Keltier ...	Ship
OMI	Alwaki ...	Ship	OOO	Scipio ...	Ship
OMJ	Aldabi ...	Ship	OOS	Smolensk ...	Ship
OMK	Gemma OMK	Ship	OOS	Serbier ...	Ship
OML	Zosma ...	Ship	OOT	Tongrier ...	Ship
OML	Tapanoeli ...	Ship	OOU	Ubier ...	Ship
OMM	Dirksland ...	Ship	OOV	Anvers ...	Ship
OMN	Maasburg ...	Ship	OOV	Devonier ...	Ship
OMO	Oldekerk ...	Ship	OOX	Phoenicier ...	Ship
OMP	Almkerk ...	Ship	OOZ	Tunisier ...	Ship
OMQ	Aagtekerk ...	Ship	OPA	Stad Antwerpen	Ship
OMS	Streekekerk ...	Ship	OPB	President Bunge	Ship
OMT	Dordrecht ...	Ship	OPC	Princesse Clemen-	
OMU	S. Philipsland	Ship		tine OPC ...	Ship
OMV	Gelderland OMV	Ship	OPE	Princesse Eliza-	
OMX	Terneuzen ...	Ship		beth ...	Ship
OMY	Ary ...	Ship	OPF	Fusilier ...	Ship
OMZ	Helena OMZ ...	Ship	OPG	Republica	
ONA	Banana ...	Belgian		Argentina ...	Ship
		Congo	OPI	Algerie ...	Ship
ONB	Brabant ONB...	Ship	OPJ	Ionier ...	Ship

OPK	Pieter De		OTG	Gouverneur De	
OPL	Coninck ...	Ship	OTI	Lantsheere	Ship
OPM	Ville De Liege	Ship	OTK	Tunisie...	Ship
OPN	Menapier ...	Ship	OTL	Canonnier ...	Ship
OPO	Nervier ...	Ship	OTN	Liege ...	Ship
	Brussels (Royal		OTP	Zinnia ...	Ship
	Meteorological		OTS	Picardier ...	Ship
	Institute) ...	Belgium	OTY	Sérésia ...	Ship
OPO	Marconier	Ship	OTZ	Turin ...	Ship
OPR	Rapide (Le) ...	Ship	OTPA	Sierra Belgrano	Ship
OPS	Persier	Ship	OUA	Arminco	Ship
OPT	Trevier...	Ship	OUB	Absalon OUA	Ship
OPU	Austurienne ...	Ship	OUC	Skagens Rev	Denmark
OPW	Macedonier ...	Ship	ODU	Schults Grund	Denmark
OPY	Olympier ...	Ship	OUD	Dannebrog ...	Ship
OPEA	Elisabethville ...	Ship	OUF	Olfert Fischer	Ship
OPLA	Pays de Liège	Ship	OUG	Gilleleje-Flak	Denmark
OPVA	Vae Victis ...	Ship	OUH	Gejser ...	Ship
OPVH	Haren (Air Port		OUI	Herluf Trolle ...	Ship
	of Brussels)	Belgium	OUI	Islands Falk ...	Ship
OPVO	Ostende-Aéro-		OUI	Hanover ...	Germany
	drome ...	Belgium	OUI	Hejmdal ...	Ship
ORA	Roi Albert ...	Ship	OUL	Laeso-Rende ...	Denmark
ORB	Bremen ...	Ship	OUM	Lossen ...	Ship
ORC	Cambrier ...	Ship	OUN	Beskytteren ...	Ship
ORF	Mars ORF ...	Ship	OUC	Lövenorn ...	Ship
ORG	Gothland ...	Ship	OUP	C. F. Grove ...	Ship
ORJ	Argentiniér ...	Ship	OUP	Peder Skram ...	Ship
ORN	Danubier ...	Ship	OVR	Hjælperen ...	Ship
ORP	Pionier ...	Ship	OVS	Anholt-Knob ...	Denmark
ORQ	Grenadier ...	Ship	OVS	Skjold ...	Ship
ORR	Roumanier ...	Ship	OVT	Laeso Trindel	Denmark
ORS	Samland ...	Ship	OVV	Gjedser Rev ...	Denmark
ORT	Spartier ...	Ship	OVV	Valkyrien OVV	Ship
ORU	Oural ...	Ship	OVV	Drogden ...	Denmark
ORV	Bolivier ...	Ship	OXX	Graadyb ...	Denmark
ORY	Mayumbe ...	Ship	OYY	Vyl ...	Denmark
ORBA	Arabia ...	Ship	OYZ	Horns Rev ...	Denmark
ORFA	Mercier ...	Ship	OVA	Anden April ...	Ship
ORFA	Erfurt ...	Ship	OVB	Havfruen ...	Ship
ORVA	Albertsville ...	Ship	OVC	Nymfen ...	Ship
ORYA	Pyrgos ...	Ship	OVD	Delfinen ...	Ship
OSA	Anvers Radio	Belgium	OVE	Havmanden	Ship
OSB	Sierra Blanca ...	Ship	OVF	Flyvefisken ...	Ship
OSC	Meissonier		OVG	Galathea ...	Ship
	OSC ...	Ship	OVH	Hvalrossen ...	Ship
OSE	Escout OSE ...	Ship	OVI	Thetis OVI ...	Ship
OSG	Sierra Grande	Ship	OVJ	Sobjornen ...	Ship
OSH	Suevier ...	Ship	OVK	Aegir ...	Ship
OSI	Iberier ...	Ship	OVL	Ran OVL ...	Ship
OSJ	Sierra Roja ...	Ship	OVM	Hermod ...	Ship
OSL	Lydie ...	Ship	OVN	Najaden ...	Ship
OSM	Sierre Morena	Ship	OVO	Ormen ...	Ship
OSM	Osmanie ...	Turkey	OVP	Triton OVP ...	Ship
OSN	Sierra Negra ...	Ship	OVQ	Neptun OVQ ...	Ship
OSO	Sierra Leone ...	Ship	OVR	Sörideren ...	Ship
OSQ	Sierra Quemada	Ship	OVS	Spaækhuggeren	Ship
OSR	Grand		OVT	Tumleren ...	Ship
	Remorquer ...	Ship	OVU	Soulven ...	Ship
OST	Ostende Radio	Belgium	OVV	Vindhunden ...	Ship
OSV	Livonier ...	Ship	OVW	Sværdfisken	Ship
OSW	Asier ...	Ship	OVX	Skagerak OVX	Ship
OSDA	Caucasier ...	Ship	OVZ	F.1 ...	Ship
OSUA	Sunoco ...	Ship	OWA	Bellona ...	Ship
OSYA	Kybfels ...	Ship	OWB	Diana OWB ...	Ship
OTA	Ville D'Anvers	Ship	OWD	Fennis ...	Ship
OTB	Elizabeth Van		OWE	Flora OWE ...	Ship
	Belgie ...	Ship	OWF	Grönsund OWF	Ship
OTC	Carabinier ...	Ship	OWG	Guldborgsund	Ship

OWH	Hajen ...	Ship	OZH	Viking OZH ...	Ship
OWI	Havhesten ...	Ship	OZI	Pacific OZI ...	Ship
OWJ	Havornen ...	Ship	OZJ	Store Nordiske	Ship
OWK	Ingolf ...	Ship	OZK	Fionia ...	Ship
OWM	Makrelen ...	Ship	OZL	Frederik VIII	Ship
OWO	Minekran V ...	Ship	OZM	Siam ...	Ship
OWP	Minekran VI ...	Ship	OZN	Annam ...	Ship
OWQ	Narhvalen ...	Ship	OZO	Phonix OZO ...	Ship
OWR	Nordkaperen ...	Ship	OZP	Tongking ...	Ship
OWS	Rota OWS ...	Ship	OZQ	Panama ...	Ship
OWT	Havkatten ...	Ship	OZR	Australien ...	Ship
OWU	Springeren ...	Ship	OZS	Arnold Mærsk...	Ship
OWV	Stören ...	Ship	OZU	Sprogo ...	Ship
OWW	Söhunden ...	Ship	OZV	Chile OZV ...	Ship
OWX	Sölöven ...	Ship	OZW	Falstria ...	Ship
OWY	Sælen ...	Ship	OZX	H. C. Orsted ...	Ship
OWZ	F.2 OWZ ...	Ship	OZY	George Stage ...	Ship
OXA	Kjobenhan Radio	Denmark	OZZ	Nordlys ...	Ship
OXA	Copenhagen	Denmark	PAA	De Zevan	Ship
OXB	Blaavand Radio	Denmark	PAB	Provincien ...	Ship
OXC	Gjedser ...	Denmark	PAC	Maarten Har-	Ship
OXD	Gjedser Havn	Denmark	PAD	pertz Tromp	Ship
OXE	Lynby Radio	Denmark	PAF	De Ruijter ...	Ship
OXF	Svendborg ...	Denmark	PAG	Hertog Hendrik	Ship
OXG	Prins Christian	Ship	PAK	Zeeland PAF	Ship
OXH	Princesse	Ship	PAL	Torpedo Boat	Ship
OXJ	Thorshavn ...	Denmark	PAQ	Gelderland	Ship
OXK	Tverraa ...	Denmark	PAR	PAK ...	Ship
OXO	Afrika ...	Ship	PAS	Jacob van	Ship
OXP	Vinland ...	Ship	PAT	Heemskerck	Ship
OXQ	Dana ...	Ship	PAU	PAL ...	Ship
OXR	Maryland OXR	Ship	PAV	Hydra ...	Ship
OXS	Smut ...	Ship	PAW	Medusa ...	Ship
OXT	Nordamerika ...	Ship	PAX	Valcanus PAS	Ship
OXU	Botnia ...	Ship	PAY	Triton ...	Ship
OXX	Ålsund ...	Ship	PAZ	Gruno ...	Ship
OXY	Valkyrien ...	Ship	PBB	Brinio ...	Ship
OYZ	Nordhvalen ...	Ship	PBC	Friso ...	Ship
OYA	Copenhagen OYA	Ship	PBD	Mijnen Verger	Ship
OYB	Nordkap ...	Ship	PBG	Cornelis Drebbel	Ship
OYC	California OYC	Ship	PBK	Zeehond ...	Ship
OYD	Gallia OYD ...	Ship	PBO	Torpedo Boot	Ship
OYE	Hans Mærsk ...	Ship	PBP	PBA ...	Ship
OYG	Kaj ...	Ship	PBQ	Douwe Aukes	Ship
OYH	Ficaria ...	Ship	PBS	Van Meerlant ...	Ship
OYI	Primula OYI ...	Ship	PBT	Pelikaan ...	Ship
OYJ	Protector OYJ	Ship	PBU	Vorwaarts ...	Ship
OYK	Rota OYK ...	Ship	PBV	Onderzeebooten	Ship
OYL	I. C. La Cour ...	Ship	PBW	PBK ...	Ship
OYN	A. P. Bernstorff	Ship	PBX	Onderzeebooten	Ship
OYO	Latvia ...	Ship	PBY	PBO ...	Ship
OYP	Finlandia ...	Ship	PBZ	PBP ...	Air
OYR	Asia OYR ...	Ship	PCA	PBQ ...	Ship
OYS	Ribe ...	Ship	PCB	PBS ...	Ship
OYT	Fredericia ...	Ship	PCC	PBT ...	Ship
OYW	Bryderen ...	Ship	PCD	PBU ...	Ship
OYX	Rask ...	Ship	PCE	PBV ...	Ship
OYY	Elenonora Mærsk	Ship	PCF	Wolf ...	Ship
OYZ	Island ...	Ship		Lynx ...	Ship
OZA	Peru ...	Ship		Fret ...	Ship
OZB	Hellig Olav ...	Ship		Buhlond ...	Ship
OZC	Oscar II OZC ...	Ship		Amsterdam ...	Holland
OZD	United States	Ship		Nieuwediep ...	Holland
OZE	Astrid ...	Ship		Helder ...	Holland
OZF	Selandia ...	Ship		Helder ...	Holland
OZG	Jutlandia ...	Ship		Flushing (Buffel)	Holland
				Flushing ...	Holland
				Mok (De) ...	Holland
				Vliegkampen ...	Holland

PCG	Kootwijk-Sam- beek ...	Holland	PEU	Patroclus ...	Ship
PCH	Scheveningen ...	Holland	PEV	Dardanus ...	Ship
PCM	Terschellinger- bank L'ship	Holland	PEW	Sommelsdijk ...	Ship
PCN	Noord-Hinder Lightship ...	Holland	PEX	Terschelling ...	Ship
PCO	Haaks Lightship	Holland	PEY	Palembang ...	Ship
PDA	Macklenburg PDA ...	Ship	PEZ	Salatiga ...	Ship
PDC	Prins Hendrik	Ship	PFA	Goentoer ...	Ship
PDE	Oranje Nassau PDE... ..	Ship	PFG	Tambora ...	Ship
PDF	Princes Juliana PDF ...	Ship	PFD	Kawi ...	Ship
PDG	Batavier VI ...	Ship	PFE	Sindoro ...	Ship
PDH	Batavier III ...	Ship	PFF	Tabanan ...	Ship
PDI	Batavier IV ...	Ship	PFG	Wilis ...	Ship
PDJ	Batavier V ...	Ship	PFH	Rindjani ...	Ship
PDK	Leonora PDK... ..	Ship	PFI	Grotius ...	Ship
PDL	Noorderdijk ...	Ship	PEJ	Johan de Witt	Ship
PDM	Ruurlo ...	Ship	PEK	Rembrandt ...	Ship
PDN	Rijnland ...	Ship	PFL	Jan Pieterszoon Coen ...	Ship
PDO	Batavier II ...	Ship	PFM	Vondel ...	Ship
PDP	Lukkos ...	Ship	PFN	Prinses Juliana PFN ...	Ship
PDQ	Maartensdijk ...	Ship	PFO	Bondowoso ...	Ship
PDR	Drechterland ...	Ship	PFP	Oranje ...	Ship
PDS	Ocean PDS ...	Ship	PFQ	Prins der Neder- landen PFQ	Ship
PDT	American PDT	Ship	PFR	Birma ...	Ship
PDU	Gooiland ...	Ship	PFS	Insulinde ...	Ship
PDV	J. B. Aug Kessler ...	Ship	PFT	Patria PFT	Ship
PDW	Selene ...	Ship	PFU	Djocja ...	Ship
PDX	Hermes PDX	Ship	PFV	Koningen der Nederlanden	Ship
PDY	Deletland ...	Ship	PFW	Bandoeng ...	Ship
PDZ	Artemis PDZ ...	Ship	PFX	Jacatra ...	Ship
PDA A	Arendskerk ...	Ship	PFY	Kediri ...	Ship
PDAB	Nijkern ...	Ship	PFZ	Walcheren ...	Ship
PDAC	Meliskerk ...	Ship	PGA	Medan ...	Ship
PDAD	Abbekerk ...	Ship	PGB	Menado ...	Ship
PDAE	Rijperkerk ...	Ship	PGC	Gorontalo ...	Ship
PDAG	Oostkerk ...	Ship	PGD	Djebres ...	Ship
PEA	Ouderkerk ...	Ship	PGE	Merauke ...	Ship
PEB	Rotterdam PEA Nieuw ...	Ship	PGG	Deli ...	Ship
PEC	Amsterdam Noordam ...	Ship	PGH	Samarinda ...	Ship
PEC	Encarnacion ...	Paraguay	PGI	Madiden ...	Ship
PED	Rijnland ...	Ship	PGJ	Soerakarta ...	Ship
PEE	Amsteldyk ...	Ship	PGK	Java PGK	Ship
PEF	Sebu ...	Ship	PGL	Krakatau ...	Ship
PEG	Gelrai ...	Ship	PGM	Sumatra PGM	Ship
PEH	Amsterdam PEH ...	Ship	PGN	Lombok ...	Ship
PEI	Zeelanda ...	Ship	PGO	Celebes... ..	Ship
PEJ	Stuvvesant ...	Ship	PGP	Kangean ...	Ship
PEK	Prins Frederick Hendrik ...	Ship	PGQ	Karimata ...	Ship
PEL	Commewijne ...	Ship	PGR	Nias ...	Ship
PEM	Oranje Nassau PEM ...	Ship	PGR	Asuncion ...	Paraguay
PEN	Prins der Neder- landen PEN	Ship	PGS	Kambangan ...	Ship
PEO	Venezuela PEO	Ship	PGT	Billiton ...	Ship
PEP	Schie ...	Ship	PGU	Boeton ...	Ship
PEQ	Van Rensselaer	Ship	PGV	Barjan ...	Ship
PER	Nickerie ...	Ship	PGW	Karimoen ...	Ship
PES	Tantalus ...	Ship	PGY	Waalwijk ...	Ship
PET	Sarpedon PET	Ship	PGZ	Westerdijk PGZ	Ship
			PHA	Radja ...	Ship
			PHB	Riouw ...	Ship
			PHC	Rotti ...	Ship
			PHE	Ceylon ...	Ship
			PHF	Djemmer ...	Ship
			PHG	Noordwijk ...	Ship
			PHH	Rotterdam PHH	Ship
			PHI	Banka ...	Ship
			PHJ	Bawean ...	Ship

PHK	Boeroe ...	Ship	PKH	Soerabaya ...	Dutch E.
PHL	Roepat... ..	Ship			Indies
PHM	Rondo PHM ...	Ship	PKJ	Neira Radio ...	Dutch E.
PHN	New York				Indies
	PHN ...	Ship	PKK	Manokwari Radio	Dutch E.
PHO	Soestdijk ...	Ship			Indies
PHP	Zuiderdijk ...	Ship	PKK	Bandoeng Radio	Dutch E.
PHQ	Iris PHQ ...	Ship			Indies
PHR	Turbiaia PHR	Ship	PKM	Chilachap Inlet	Dutch E.
PHS	Voorburg ...	Ship			Indies
PHT	Sitoebondo ...	Ship	PKP	Pijnacker Hordijk	Ship
PHU	Buitenzorg ...	Ship	PKQ	Van Outhoorn	Ship
PHV	Bintang PHV	Ship	PKR	Van Neck ...	Ship
PHW	Willem van		PKS	Van Heemskerk	Ship
	Driel S.R. ...	Ship	PKT	Van Waerwyck	Ship
PHX	Warszawa PHX	Ship	PKW	Juno PKW ...	Ship
PHY	Borneo ...	Ship	PKX	Malabang ...	Philippine
PHZ	Bengkalis ...	Ship			Islands
PIA	Roode Zee ...	Ship	PLA	Telegraaf ...	Ship
PIB	Humber ...	Ship	PLB	Zeeslang ...	Ship
PIC	Witte Zee PIC	Ship	PLC	Koetei ...	Ship
PID	Zwarte Zee PID	Ship	PLD	Tydemian	Ship
PIE	Stad Zwolle ...	Ship	PLE	Van Doorn ...	Ship
PIF	Stad Zaandam	Ship	PLF	Sumbawa ...	Ship
PIG	Valkenburg ...	Ship	PLG	Hercules PLG...	Ship
PIH	Friesland ...	Ship	PLH	Tjikembang ...	Ship
PII	Stad Arnhem ...	Ship	PLI	Tjisondari ...	Ship
PIJ	Zaandijk PIJ	Ship	PLJ	Tjimanoeck ...	Ship
PIK	Bali PIK ...	Ship	PLK	Tjitaroem ...	Ship
PIL	Gorredijk ...	Ship	PLL	Tjibodas ...	Ship
PIM	Djambi ...	Ship	PLM	Tjikini ...	Ship
PIN	Garoet ...	Ship	PLN	Tjiliwong ...	Ship
PIO	Tosari ...	Ship	PLO	Tjipanas ...	Ship
PIP	Yseldijk PIP ...	Ship	PLP	Tjilatjap ...	Ship
PIQ	Schiedijk ...	Ship	PLQ	Tjileboet ...	Ship
PIR	Veendijk ...	Ship	PLR	Tjisalak ...	Ship
PIS	Winterswijk ...	Ship	PLS	Tjikarang ...	Ship
PIT	Rijswijk ...	Ship	PLU	India PLU ...	Ship
PIU	Randwijk ...	Ship	PLW	Tjikandi ...	Ship
PIV	Brunswijk ...	Ship	PLY	Mataram PLY	Ship
PIW	Eibergen ...	Ship	PLZ	Siboga ...	Ship
PIX	Ameland ...	Ship	PMA	Omhillin ...	Ship
PIY	Celaeno ...	Ship	PMB	Siberg ...	Ship
PIZ	Kelbergen ...	Ship	PMC	Houtman ...	Ship
PJA	Aruba ...	Curaçao	PMD	Melchior Treub	Ship
PJB	Bonaire ...	Curaçao	PME	Van Overstraten	Ship
PJC	Curaçao ...	Curaçao	PMF	De Greve ...	Ship
PJD	S. Martin ...	Curaçao	PMH	Roggeveen ...	Ship
PJN	Baralt PJN ...	Ship	PMI	Barentsz ...	Ship
PJN	Paramaribo	Dutch	PMJ	Van Cloon ...	Ship
	Radio	Guiana	PMJ	S. Jacob ...	Ship
PJO	Moengo ...	Dutch	PMK	Rumphius ...	Ship
		Guiana	PMM	Van Spilbergen	Ship
PJP	Albina ...	Dutch	PMN	Van der Hagen	Ship
		Guiana	PMQ	Le Maire ...	Ship
PKA	Sabang ...	Dutch E.	PMS	Sloet van de	
		Indies		Beele ...	Ship
PKB	Weltevreden ...	Dutch E.	PMT	Van Linschoten	Ship
		Indies	PMU	Van Imhoff ...	Ship
PKC	Sitoebondo ...	Dutch E.	PMV	Van Rees ...	Ship
		Indies	PNQ	Amazonas PNQ	Ship
PKD	Koepang Radio	Dutch E.	POZ	Nauen ...	Germany
		Indies	PPA	Tapajoz ...	Ship
PKE	Amboina ...	Dutch E.	PPB	Aracaty ...	Ship
		Indies	PPC	Araquary ...	Ship
PKF	Balikpapan	Dutch E.	PPD	Assu ...	Ship
	Radio	Indies	PPE	Capivary ...	Ship
PKG	Tarakan Radio	Dutch E.	PPF	Corcovado ...	Ship
		Indies	PPG	Gurupy ...	Ship

PPK	Jaquaribe ...	Ship	PVU	Guajara ...	Ship
PPL	Jacuhy ...	Ship	PVV	Ibiapaba ...	Ship
PPN	Mossoro ...	Ship	PVW	Mantiquera ...	Ship
PPO	Mucury ...	Ship	PVY	Itaquatia ...	Ship
PPS	Taquary ...	Ship	PWA	Morro ...	Cuba
PPU	Tibagy ...	Ship	PWB	Nueva Gerona ...	Cuba
PPV	Itapacy ...	Ship	PWC	Santa Clara ...	Cuba
PPX	Itaperuna ...	Ship	PWD	Chaparra ...	Cuba
PPY	Itapiava ...	Ship	PWF	Pinar del Rio ...	Cuba
PPZ	Itaituba ...	Ship	PWG	Fé (La) ...	Cuba
PQC	Corvo ...	Portugal	PWH	Hatuey ...	Ship
PQL	Lisbon ...	Portugal	PWI	Cuba PWI ...	Ship
PQT	Terceira Radio ...	Portugal	PWJ	Patria PWJ ...	Ship
PRH	Prague ...	Czecho-Slovakia	PWK	Yara ...	Ship
			PWL	Baire ...	Ship
PSB	Hidra ...	Ship	PWM	E. Villuendas ...	Ship
PSC	Bengo ...	Ship	PWN	Viente de Mayo ...	Ship
PSD	Quanza ...	Ship	PWO	Viente y Cuatro de Febrero ...	Ship
PSE	Mandovi ...	Ship	PWP	Diez de Octubre ...	Ship
PSH	Limpopo ...	Ship	PWQ	Villas ...	Ship
PSO	Poznan ...	Poland	PWS	Caza Submarino Numero 1 ...	Ship
PSO	Posen ...	Germany		Caza Submarino Numero 2 ...	Ship
PTC	Forteleza de Santa Cruz ...	Brazil	PWT	Caza Submarino Numero 3 ...	Ship
PTI	Forteleza de Imbuhy ...	Brazil	PWU	Caza Submarino Numero 4 ...	Ship
PTJ	Forteleza de S. Joao ...	Brazil	PWV	Pepe Caragol ...	Ship
PTL	Forteleza da Lage ...	Brazil	PWAJ	Arundo ...	Ship
PTN	Nichteroy ...	Brazil	PXB	Themisto ...	Ship
PTQ	Quartel General ...	Brazil	PXC	Hagno ...	Ship
PTV	Villa Militar ...	Brazil	PXD	Barendrecht ...	Ship
PUA	Anna PUA ...	Ship	PXE	Mijdrecht ...	Ship
PUB	Tabatinga ...	Ship	PXF	Ridderkerk ...	Ship
PUC	Santarém ...	Ship	PXG	Baralt ...	Ship
PUD	Barbacena ...	Ship	PXI	Mirach ...	Ship
PUE	Guaratuba ...	Ship	PXJ	Sirrah PXJ ...	Ship
PUF	Curityba ...	Ship	PXK	Algenib ...	Ship
PUH	Joazeiro ...	Ship	PXL	Alphard ...	Ship
PUI	Lages ...	Ship	PXM	Yildum ...	Ship
PUI	Macapá ...	Ship	PXN	Alkaid ...	Ship
PUK	Cabedello ...	Ship	PXO	Maashaven ...	Ship
PUM	Maranguape ...	Ship	PXP	Thuban ...	Ship
PUN	Ilheos ...	Ship	PXQ	Bellatrix PXQ ...	Ship
PUO	Cannavieras ...	Ship	PXR	Procyon ...	Ship
PUP	Jequitinhonha ...	Ship	PXS	Dubhe ...	Ship
PUQ	Commandatuba ...	Ship	PXT	Zwarte Zee PXT ...	Ship
PUR	Marahú ...	Ship	PXV	Ootmarsum ...	Ship
PUS	Porto Seguro ...	Ship	PXW	Delet ...	Ship
PUT	Guararapes ...	Ship	PXX	Jan. V. Nassau ...	Ship
PUU	Philadelphia ...	Ship	PXZ	Juno PXZ ...	Ship
	PUU ...	Ship	PYA	Johanna ...	Ship
PUV	Brazileira ...	Ship	PYB	Jason ...	Ship
PUY	Ada PUY ...	Ship	PYC	Orestes PYC ...	Ship
PUZ	Zilka ...	Ship	PYD	Shedrecht ...	Ship
PVA	Belem ...	Ship	PYE	Wieldrecht ...	Ship
PVB	Campeiro ...	Ship	PYF	Ubbergen ...	Ship
PVC	Concepcion ...	Paraguay	PYF	Callisto ...	Ship
PVD	Campinas PVD ...	Ship	PYG	Almelo ...	Ship
PVE	Neuquen ...	Ship	PYH	Alkmaar ...	Ship
PVH	Guanabara ...	Ship	PYI	Canymedes ...	Ship
PVI	Marne PVI ...	Ship	PYJ	Eemland ...	Ship
PVJ	Piave ...	Ship	PYK	Gaasterland ...	Ship
PVK	Rio Amazonas ...	Ship	PYL	Kennermerland ...	Ship
PVL	Antonina ...	Ship	PYM	Maasland ...	Ship
PVN	Brazil PVN ...	Ship	PYN	Lingestroom ...	Ship
PVR	Bocaina ...	Ship	PYP	Ellewoutsdijk ...	Ship
PVT	Bragança ...	Ship			

PYQ	Batoe ...	Ship	RDG	Sredne ...	Russia
PYR	Ambon...	Ship	RDH	Odessa Observa- toire	Russia
PYS	Ceram ...	Ship	RDI	Petrozawodsk	Russia
PYT	Calcutta PYT	Ship	RDJ	Staraja Boukhara	Russia
PYU	Crynsen ...	Ship	RDK	Tiflis ...	Georgia
PYV	Ulysses ...	Ship			Rep.
PYW	Ceres PYW	Ship	RDM	Rotterdam ...	Holland
PYX	Noorddijk ...	Ship	RDM	Waalhaven ...	Holland
PYY	Kinderdyk PYY	Ship	RGA	Riga ...	Latvia
PYZ	Rijndijk ...	Ship	RNL	Nikolaiefsk ...	Siberia
PZA	Bijssum ...	Ship	RNN	Naiakhansk ...	Siberia
PZB	Leesum ...	Ship	RNR	Anadir ...	Siberia
PZC	Larenberg ...	Ship	ROT	Okhotsk ...	Siberia
PZD	Hilversum ...	Ship	RPK	Petropavlovsk	Siberia
PZE	Oostdijk ...	Ship	SN	Santiago ...	Cuba
PZF	Trompenberg ...	Ship	SW	Hamburg ...	Germany
PZG	Marken ...	Ship	SAA	Karlskrona Radio	Sweden
PZI	Rijnsburg ...	Ship	SAB	Vinga Island ...	Sweden
PZJ	Salland ...	Ship	SAB	Göteborg Radio	Sweden
PZL	Antenor ...	Ship	SAC	Trälleborg Radio	Sweden
PZM	Banda ...	Ship	SAE	Gottland, L'ship	Sweden
PZN	Waterland ...	Ship	SAF	Vaxholm Radio	Sweden
PZO	Zaaland ...	Ship	SAG	Olandsrey ...	Sweden
PZP	Stad Dordrecht	Ship	SAH	Härnösand Radio	Sweden
PZQ	Stad Zalt Bommel ...	Ship	SAI	Boden Radio ...	Sweden
PZR	Stad Amsterdam	Ship	SAJ	Karlsborg Radio	Sweden
PZS	Rozenburg ...	Ship	SAK	Grundkallen Lightship ...	Sweden
PZT	Westerdijk ...	Ship	SBA	Svea ...	Ship
PZU	Amstelland ...	Ship	SBB	Gota ...	Ship
PZV	Zeeland PZV	Ship	SBC	Thule SBC ...	Ship
PZW	Montferland ...	Ship	SBD	Oden ...	Ship
PZY	Drente ...	Ship	SBE	Thor ...	Ship
RT	Rotterdam ...	Holland	SBF	Niord ...	Ship
RAS	Vladivostok ...	Russia	SBG	Dristighetten ...	Ship
RBD	Carl-Marks ...	Ship	SBH	Aran ...	Ship
RBE	Argoun ...	Ship	SBI	Wasa SBI ...	Ship
RBF	Transbalt ...	Ship	SBJ	Trapperheten ...	Ship
RBG	Litke ...	Ship	SBL	Oscar II SBL ...	Ship
RBH	Roussanoff ...	Ship	SBM	Fylgia ...	Ship
RBI	Malyguin ...	Ship	SBO	Ornen ...	Ship
RBJ	Iamala ...	Ship	SBP	Jacob Bagge ...	Ship
RBK	Stepan Mararov	Ship	SBQ	Claes Horn ...	Ship
RBL	Scotratov ...	Ship	SBS	Psilander ...	Ship
RBM	Sedov ...	Ship	SBT	Rota SBT ...	Ship
RBN	Sibiriakov ...	Ship	SBU	Skuld ...	Ship
RBO	Ledocol N—5	Ship	SBV	Edda ...	Ship
RBP	Ledocol N—6	Ship	SBW	Drott ...	Ship
RBQ	Ledocol N—7	Ship	SBX	Blenda ...	Ship
RBR	Ledocol N—8	Ship	SBY	Mode ...	Ship
RBS	Ledocol N—9	Ship	SBZ	Magne ...	Ship
RBT	Iouchar ...	Ship	SCA	Wale ...	Ship
RBV	Sosnovetz ...	Ship	SCB	Ragnar ...	Ship
RBW	Oumba ...	Ship	SCC	Sigurd ...	Ship
RBX	Ermak ...	Ship	SCD	Vidar ...	Ship
RBZ	Decabrist ...	Ship	SCE	Hugin ...	Ship
RBY	Vetche ...	Ship	SCF	Munin ...	Ship
RCA	Pestel ...	Ship	SCG	Tirfing ...	Ship
RCB	Polesnyi ...	Ship	SCH	Thördon ...	Ship
RCB	Dimetri ...	Ship	SCI	Glas Fleming ...	Ship
RCJ	Iamala ...	Ship	SCI	Skäggald ...	Ship
RCW	Ermak ...	Ship	SCK	Svenskund ...	Ship
RCY	Pourga ...	Ship	SCL	Sverige... ..	Ship
RCZ	Trouvor ...	Ship	SCM	Wachtmeister	Ship
RDA	Lénine ...	Ship	SCN	Wrangel ...	Ship
RDB	Sviatogor RDB	Ship	SCO	Gustav V ...	Ship
RDC	Ogon ...	Ship	SCP	Drottning Victoria ...	Ship
RDD	Ignatii Sergehev	Ship			
RDE	Odessa-Kolymsk	Siberia			

SCQ	Ran SCQ	...	Ship	SGF	Sydic	...	Ship
SCT	Svalan	...	Ship	SGG	Nordic	...	Ship
SCU	Falken	...	Ship	SGH	Heimdall	...	Ship
SCV	Tarnan	...	Ship	SGJ	Siljan	...	Ship
SCW	Ejdern	...	Ship	SGK	Iris SGK	...	Ship
SDA	Ragunda	...	Ship	SGL	Stockholm	...	Ship
SDB	Fritiof	...	Ship	SGM	Sagoland	...	Ship
SDC	Irene SDC	...	Ship	SGN	Holmengra	...	Ship
SDD	Convailaria	...	Ship	SGO	Balber	...	Ship
SDE	Torgerd	...	Ship	SGQ	Jaffa	...	Ship
SDF	Orania SDF	...	Ship	SGR	Carlsholm	...	Ship
SDG	Arator	...	Ship	SGT	Suecia	...	Ship
SDH	Allegro	...	Ship	SGU	Skagern	...	Ship
SDI	Marie	...	Ship	SGV	G. D. Kennedy	...	Ship
SDJ	Ulla	...	Ship	SGW	Valparaiso	...	Ship
SDK	Kiruna	...	Ship	SGX	Japan SGX	...	Ship
SDL	Gudmundra	...	Ship	SGY	Ceylon SGY	...	Ship
SDM	Formosa SDM	...	Ship	SGZ	Falka	...	Ship
SDN	Eros SDN	...	Ship	SHA	Bolmen	...	Ship
SDO	Hispania	...	Ship	SHC	Portos	...	Ship
SDQ	Canada SDQ	...	Ship	SHF	Yeddo	...	Ship
SDR	Sigvar	...	Ship	SHG	Aspen	...	Ship
SDT	Boren	...	Ship	SHI	Anten	...	Ship
SDU	Sulina	...	Ship	SHJ	Lima SHJ	...	Ship
SDV	Neptun SDV	...	Ship	SHM	Scandinavic	...	Ship
SDW	Herakles SDW	...	Ship	SHN	Bullaren	...	Ship
SDX	Othello SDX	...	Ship	SHO	Hansa SHO	...	Ship
SDY	Orlando SDY	...	Ship	SHP	Yngaren	...	Ship
SDZ	Roxen	...	Ship	SHQ	Tisnaren	...	Ship
SEA	Konung Gustaf V.	...	Ship	SHR	Isbrytaren II	...	Ship
SEB	Drottning Viktoria	...	Ship	SHS	Magda	...	Ship
SEC	Skagerak SEC	...	Ship	SHT	Bris	...	Ship
SED	Malmö	...	Ship	SHU	Faxen	...	Ship
SFA	Hibernia SFA	...	Ship	SHV	Oscar Midling	...	Ship
SFB	Saga SFB	...	Ship	SHW	Patricia SHW	...	Ship
SFC	Thule SFC	...	Ship	SHX	Balboa SHX	...	Ship
SFD	Scotia SFD	...	Ship	SHY	Atland	...	Ship
SFE	Indianic	...	Ship	SHZ	Turbinia SHZ	...	Ship
SFF	Hellenic	...	Ship	SIA	Anglia SIA	...	Ship
SFG	Tasmanic	...	Ship	SIB	Liguria	...	Ship
SFH	Australic	...	Ship	SIC	Masilia	...	Ship
SFI	Belos	...	Ship	SID	Catalonia	...	Ship
SFJ	Torne	...	Ship	SIE	Harald SIE	...	Ship
SFK	Regin	...	Ship	SIF	Vinga	...	Ship
SFL	Abisko	...	Ship	SIG	Gullmarn	...	Ship
SFM	Meta	...	Ship	SIH	Gustavsholm	...	Ship
SFO	Vollrath Tham	...	Ship	SII	Odessa	...	Ship
SFP	Sir Ernest Cassel	...	Ship	SIJ	Varna	...	Ship
SFQ	Kratos	...	Ship	SIK	Cavalla	...	Ship
SFR	Falco SFR	...	Ship	SIL	Stureholm	...	Ship
SFS	Africanic	...	Ship	SIM	Hermes SIM	...	Ship
SFT	Atlantic	...	Ship	SIN	Egil	...	Ship
SFU	Baltic SFU	...	Ship	SIO	Nippon	...	Ship
SFV	Kronprins Gustaf Adolf	...	Ship	SIP	Carmen SIP	...	Ship
SFW	Boden SFW	...	Ship	SIQ	Holmia	...	Ship
SFX	Narvik	...	Ship	SIR	Salen	...	Ship
SFY	Kronprinsessan Margareta	...	Ship	SIS	Svarten	...	Ship
SFZ	Pacific SFZ	...	Ship	SIT	Mertainen	...	Ship
SGA	Knappingsborg	...	Ship	SIU	Buenos Aires	...	Ship
SGB	Canton	...	Ship		SIU	...	Ship
SGC	S. Francisco	...	Ship	SIV	Italia SIV	...	Ship
	SGC	...	Ship	SIW	Bernicia	...	Ship
SGD	Sumatra SGD	...	Ship	SIX	Lombardia	...	Ship
SGE	Pedro Christophersen	...	Ship	SIY	Ragne	...	Ship
				SIZ	Sonja	...	Ship
				SJA	Alstern	...	Ship
				SJB	Laponia	...	Ship
				SJC	Mjörn	...	Ship
				SJD	Elsa	...	Ship

SJE	Sigyn ...	Ship	SMG	Uden ...	Ship
SJG	Carolina SJG ...	Ship	SMJ	Oscar ...	Ship
SJH	Ada Gorthon ...	Ship	SML	Marcato ...	Ship
SJK	Signe ...	Ship	SMM	Bodia ...	Ship
SJL	Miranda ...	Ship	SMN	C. G. Thulin ...	Ship
SJM	Drottningholm ...	Ship	SMO	Industria SMO	Ship
SJN	Erland ...	Ship	SMP	Moria ...	Ship
SJP	Fernebo ...	Ship	SMQ	Tilia ...	Ship
SJR	Oswal ...	Ship	SMT	Bolivia SMT ...	Ship
SJT	Porjus ...	Ship	SMU	Lunaria ...	Ship
SJU	Graecia ...	Ship	SMV	Calabria SMV	Ship
SJV	Gallia SJV ...	Ship	SMX	Vicia ...	Ship
SJW	Ivernia ...	Ship	SMY	Mongolia SMY	Ship
SJX	Cecilia Sanne ...	Ship	SNA	Alagoas ...	Ship
SJZ	Malmen ...	Ship	SNB	Bahia SNB ...	Ship
SKA	Thyra SKA ...	Ship	SNC	Ceara SNC ...	Ship
SKC	Tolken ...	Ship	SND	Deodoro ...	Ship
SKD	Gottfriid ...	Ship	SNE	Para SNE ...	Ship
SKF	Lestris ...	Ship	SNF	Floriano ...	Ship
SKG	Reserv ...	Ship	SNH	Paraná SNH ...	Ship
SKH	Adolf ...	Ship	SNI	Ilha Das Cobras	Brazil
SKI	Benares ...	Ship	SNJ	Jose Bonifacio	Ship
SKJ	Strassa ...	Ship	SNK	S. Catherina ...	Ship
SKK	Braheholm ...	Ship	SNL	Laurindo Pitta	Ship
SKL	Hogland ...	Ship	SNM	Minas Geraes	Ship
SKM	Osterland ...	Ship	SNO	Sergipe SNO ...	Ship
SKN	Nordland ...	Ship	SNP	S. Paulo SNP	Ship
SKO	Gotaland ...	Ship	SNQ	Ilha De	Brazil
SKP	Nyland ...	Ship	SNR	Boqueirao ...	Brazil
SKQ	Inland ...	Ship	SNS	Natal Notre ...	Brazil
SKR	Smyrna ...	Ship	SNU	Rio Grande Do	Ship
SKT	Uppland ...	Ship	SNV	Norte ...	Ship
SKU	Smaland ...	Ship	SNW	Ladario ...	Brazil
SKV	Hemland ...	Ship	SNZ	Villegaignon ...	Brazil
SKW	Ferm ...	Ship	SOA	Armacao ...	Brazil
SKX	Salonika SKX	Ship	SOB	Ilha Raza ...	Brazil
SKY	Borg ...	Ship	SOC	Amazonas SOA	Ship
SLB	Gerd ...	Ship	SOD	Barroso ...	Ship
SLC	Vidar SLC	Ship	SOE	Benjamin	Ship
SLD	O. A. Brodin ...	Ship	SOG	Constant ...	Ship
SLE	Roland SLE ...	Ship	SOH	Port Sudan	Egypt
SLF	Algeria SLF ...	Ship	SOI	Radio ...	Prazil
SLG	Atlanten ...	Ship	SOK	Carlos Gomes ...	Ship
SLH	Wellam de	Ship	SOL	Matto Grosso ...	Ship
SLI	Besche ...	Ship	SOQ	Ilha De	Brazil
SLJ	Oljaren ...	Ship	SOR	Governado ...	Ship
SLK	Trolleholm ...	Ship	SOT	Jaguarao ...	Ship
SLL	Colombia SLK	Ship	SOU	Sargento	Ship
SLL	Storvik ...	Ship	SOV	Albuquerque	Ship
SLM	Fagervik ...	Ship	SOW	Belmonte ...	Ship
SLN	Karlsvik ...	Ship	SOX	Parahyba ...	Ship
SLO	Bard ...	Ship	SOY	Ilha de	Brazil
SLP	Gellivare ...	Ship	SOZ	Mocanguê ...	Brazil
SLQ	Kalix ...	Ship	SPA	Rio Grande Do	Ship
SLR	Polcirkelm ...	Ship	SPB	Sul ...	Ship
SLS	Svarton ...	Ship	SPE	Tiradentes SOT	Ship
SLT	Grangesberg ...	Ship	SPJ	Republica ...	Ship
SLU	C. F. Liljevalch	Ship	SPL	Escola Naval ...	Brazil
SLV	Astur ...	Ship		Sousmarin F.1	Ship
SLW	Kalmar ...	Ship		Sousmarin F.3	Ship
SLX	Louis de Geer...	Ship		Piauhuy ...	Ship
SLX	Holmen I ...	Ship		Sousmarin F.5	Ship
SLY	Augusta ...	Ship		Amaralina ...	Brazil
SLZ	August Leffler	Ship		Para (Belem) ...	Brazil
SMA	Zelos ...	Ship		Escola Radio ...	Brazil
SMC	Lygnern ...	Ship		Juncacao ...	Brazil
SMD	Lord ...	Ship		Schiphol ...	Holland
SME	Gertrud SME ...	Ship			
SMF	Hedrun ...	Ship			

SPN	Fernando		STB	Itatinga	...	Ship
SPO	Noronha	...	STB	Soesterberg	...	Holland
SPS	Olinda	...	STC	Itassucé	...	Ship
SPT	Mont Serrat	...	STD	Itapuhy	...	Ship
SPY	Cape St. Thomé	...	STE	Itaquera	...	Ship
SQC	Babylonia	...	STF	Itagiba...	...	Ship
SOL	Cruzeiro Do Sul	...	STG	Itajuba	...	Ship
SOM	Labrea	...	STH	Itapema	...	Ship
SQN	Manãos	...	STI	Itapuca	...	Ship
SQR	Senna Madureira	...	STI	Itauba	...	Ship
SOS	Rio Branco	...	STK	Itabera	...	Ship
SOT	Santarém	...	STL	Itamaraca	...	Ship
SQV	Tarauacá	...	STM	Therezina	...	Ship
SQX	Porto Velho	...	STN	Tocantins	...	Ship
SRA	Xapury	...	STO	Taubaté	...	Ship
	Rio de Janeiro		STP	Parnahyba	...	Ship
SRB	SRA	...	STO	Benevente	...	Ship
	Minas Geraes		STR	Campos	...	Ship
	SRB	...	STS	Iguassú	...	Ship
SRC	Sao Paulo SRC	...	STT	Sasbará	...	Ship
SRD	Ceará SRD	...	STV	Pelotas...	...	Ship
SRE	Bahia SRE	...	STW	Victoria STW	...	Ship
SRE	Acré	...	STX	Alegrete	...	Ship
SRG	Satellite	...	STY	Aracjú	...	Ship
SRH	Sergipe SRH	...	STZ	Mandú	...	Ship
SRI	Laguna SRI	...	SUA	Mahroussa	...	Ship
SRK	Maranhao	...	SUB	Port Said	...	Egypt
SRL	Olinda	...	SUC	Abu Zabal Radio	...	Egypt
SRM	Brazil SRM	...	SUD	Port Sudan	...	Sudan
SRO	Mercedes	...		Radio	...	Sudan
SRP	Oyapock	...	SUF	Aida	...	Ship
SRQ	Para SRQ	...	SUG	Abdel Moneim	...	Ship
SRR	Servuld Dourado	...	SUH	Alexandria	...	Egypt
SRS	Manãos	...		Radio	...	Egypt
SRT	Ruy Barbosa	...	SUI	Sollum	...	Ship
SRU	Iris SRU	...	SUK	Raquib	...	Ship
SRV	Prudente de Moraes	...	SUL	Khartoum	...	Sudan
	Sirio SRW	...	SVA	Adriaticos	...	Ship
SRW	Almirante	...	SVB	Chios	...	Ship
SRX	Jaceguay	...	SVC	Andros	...	Ship
	Javary	...	SVD	Pelonissos	...	Ship
SRY	Florianopolis	...	SVE	Erissos	...	Ship
SRZ	Wenceslau Braz	...	SVF	Mykali	...	Ship
SSA	Commandante	...	SVG	Choissa	...	Ship
SSB	Belham	...	SVH	Hydra SVH	...	Ship
	Goyaz	...	SVI	Nicolaos	...	Ship
SSC	Pyrineus	...		Athanassulis	...	Ship
SSD	Purús	...	SVJ	Antigoni	...	Ship
SSE	Itu	...	SVK	Kalypso Vergotti	...	Ship
SSF	Ayruoca	...	SVK	Antonios	...	Ship
SSG	Curvello	...	SVL	Elpis	...	Ship
SSH	Jaboatao	...	SVM	Athina	...	Ship
SSI	Avaré	...	SVN	Ourana	...	Ship
SSJ	Inga	...	SVO	Ermourpolis	...	Ship
SSK	Atalaya SSL	...	SVP	Patris	...	Ship
SSL	Cuyaba	...	SVO	Melpo	...	Ship
SSN	Poconé	...	SVR	Archangelos	...	Ship
SSP	Almirante	...	SVS	Andreas	...	Ship
SSQ	Saldanha	...	SVT	Themistocles	...	Ship
	Sobral	...		SVT	...	Ship
SSR	Alfenas	...	SVU	Rokos Vergotis	...	Ship
SSS	Caxias	...	SVV	Megali Hellas	...	Ship
SST	Bage	...	SVW	Istros	...	Ship
SSU	Leopoldina	...	SVY	Irène SVY	...	Ship
SSV	Caxambu	...	SVZ	Dirphys	...	Ship
SSW	Baependy	...	SVAS	Theofano	...	Ship
SSX	Santos	...	SVBS	Popi	...	Ship
SSY	Itapura	...	SWA	Aeon SWA	...	Ship
STA			SWB	Pantias Rallis	...	Ship

SWC	Dionyssios		SYP	Panthir ...	Ship
	Stathatos ...	Ship	SYO	Psara ...	Ship
SWD	Efstathios ...	Ship	SYR	Proussa ...	Ship
SWE	Kea ...	Ship	SYS	Spetsai SYS ...	Ship
SWF	Michael Pistis	Ship	SYT	Thyella ...	Ship
SWG	Argolis ...	Ship	SYU	Alkyon... ..	Ship
SWH	Elpidopnorus ...	Ship	SYV	Aigli ...	Ship
SWI	Aristides Bistis	Ship	SYW	Arethousa ...	Ship
SWJ	Iolkos ...	Ship	SYX	Daphni ...	Ship
SWK	Evangelos ...	Ship	SYZ	Doris SYZ ...	Ship
SWL	Livanos ...	Ship		Thetis SYZ ...	Ship
SWM	Maroudio		SZA	Helli ...	Ship
	Inglessi ...	Ship	SZB	Limnos ...	Ship
SWN	Nora Saliari ...	Ship	SZC	Kilkis ...	Ship
SWO	Elin ...	Ship	SZD	Torpillovolon B	Ship
SWP	Panaghis ...	Ship	SZE	Promithefs ...	Ship
SWQ	Othon Stathatos	Ship	SZF	Torpillovolon r	Ship
SWR	Ioannis Vatis ...	Ship	SZG	Torpillovolon 4	Ship
SWS	Granicos ...	Ship	SZH	Torpillovolon X	Ship
SWT	Iro ...	Ship	SZI	Tenedos SZI ...	Ship
SWU	Eperoki ...	Ship	SZJ	Alieftikon Y1	Ship
SWV	Zakynthos ...	Ship	SZK	Alieftikon Y.2	Ship
SWW	Zannos Sifneos	Ship	SZL	Alieftikon Y.3	Ship
SWX	Adamantios		SZM	Alieftikon Y.4	Ship
	Lemos ...	Ship	SZN	Alieftikon Y.5	Ship
SWY	Michael L.		SZO	Alieftikon Y.6	Ship
	Embiricos ...	Ship	SZP	Evdromon A.	Ship
SWZ	Kate ...	Ship	SZO	Evdromon B	Ship
SWNS	Meandros ...	Ship	SZR	Evdromon T ...	Ship
SWOS	Vassilios		SZS	Evdromon V ...	Ship
	Destournis ...	Ship	SZT	Evdromon E.	Ship
SWPS	Athanasios ...	Ship	SZU	Evdromon Z. ...	Ship
SWQS	Daphne SWQS	Ship	SZV	Evdromon H.	Ship
SWRS	Nicolaos		SZW	Evdromon O	Ship
	Zafirakis ...	Ship	SZX	Evdromon I. ...	Ship
SWSS	Evros ...	Ship	SZY	Evdromon K.	Ship
SWTS	Demitrios		SZAS	Voithitikon 1 ...	Ship
	Pan Jelis ...	Ship	SZBS	Voithitikon 2 ...	Ship
SWUS	Eugenie S.		SZCS	Voithitikon 3 ...	Ship
	Embiricos ...	Ship	SZDS	Voithitikon 4 ...	Ship
SWVS	Eleni Stathatos	Ship	SZES	Voithitikon 5 ...	Ship
SWWS	Maria Stathatos	Ship	SZFS	Voithitikon 6 ...	Ship
SWXS	Polyktor ...	Ship	SZGS	Katadyomenon 1	Ship
SWYS	Eugenia ...	Ship	SZHS	Katadyomenon 2	Ship
SWZS	Achilles SWZS	Ship	SZIS	Katadyomenon 3	Ship
SXA	Athens ...	Greece	SZJS	Katadyomenon 4	Ship
SXB	Athens No. 2 ...	Greece	SZKS	Katadyomenon 5	Ship
SXC	Salonica		SZLS	Katadyomenon 6	Ship
SXD	Dedeagatch ...	Greece	TFA	Reykjavik Radio	Iceland
SXF	Fassa ...	Greece	TFB	Flatcy a	
SXG	Athènes ...	Greece		Bréidafirdi ...	Iceland
SXK	Corfu ...	Greece	TFC	Vestmannaeyjar	
SXL	Salamise ...	Greece		Radio ...	Iceland
SXP	Poros ...	Greece	TFG	Gullfoss ...	Ship
SYA	Averoff ...	Ship	TFI	Thor TFI ...	Ship
SYB	Velos ...	Ship	TFJ	Egill	
SYC	Lonchi ...	Ship		Skallagrimsson	Ship
SYD	Smyrne ...	Ship	TFL	Lagarfoss ...	Ship
SYE	Ireax ...	Ship	TFM	Godafoss ...	Ship
SYF	Sfendoni ...	Ship	TFN	Belgium ...	Ship
SYG	Alfios ...	Ship	TFO	Thorlur	Ship
SYH	Hydra SYH	Ship	TFR	Skallagrimur ...	Ship
SYI	Aspis ...	Ship	TGA	Daphne TGA	Ship
SYJ	Pergamos ...	Ship	TGB	Pelops ...	Ship
SYK	Pinios SYK	Ship	TGC	Pinios TGC	Ship
SYL	Leon ...	Ship	TGD	Spetsai TGD	Ship
SYN	Athina ...	Ship	TGE	Elsie ...	Ship
SYN	Niki ...	Ship	TGF	Ismene	Ship
SYO	Aetos ...	Ship	TGG	Spyridon ...	Ship

TGH	Eftichia Vergotti	Ship	TIR	Ciervana ...	Ship
TGI	Agapi ...	Ship	TIS	Condede Abasolo	Ship
TGJ	Thyra ...	Ship	TIT	Cosme y Jacinta	Ship
TGK	Syros TKG	Ship	TIU	Christina Rueda	Ship
TGL	Sifnos ...	Ship	TIV	Cristobal Llusa	Ship
TGM	Milos ...	Ship	TIW	Donato...	Ship
TGN	Tinos ...	Ship	TIX	Durango ...	Ship
TGO	Ioannis ...	Ship	TIY	Escoland ...	Ship
TGP	Nea Ellas ...	Ship	TIZ	Espana No. 1...	Ship
TGO	Aris ...	Ship	TJA	Espana No. 2...	Ship
TGR	Delphin TGR ...	Ship	TJB	Espana No. 3 ...	Ship
TGS	Cephalonia TGS	Ship	TJC	Espana No. 4 ...	Ship
TGT	Atromitos ...	Ship	TJD	Espana No. 5 ...	Ship
TGV	Aradia TGV ...	Ship	TJE	Espana No. 6 ...	Ship
TGW	Sparti ...	Ship	TJF	Jacinto Suárez	Ship
TGX	Byzantion ...	Ship	TJG	Gloria ...	Ship
TGY	Fotis ...	Ship	TJH	Goizeko-Izarra	Ship
TGZ	Elena Margarita	Ship	TJI	Altobizkar-Mendi	Ship
THA	Emmanuel ...	Ship	TJJ	Isabel de Llusa	Ship
THB	Tharros ...	Ship	TJK	Igualada ...	Ship
THC	Policos ...	Ship	TJL	Iturri Urdina	Ship
THD	Chalkis...	Ship	TJM	J. C. Llusa ...	Ship
THE	Argo THE ...	Ship	TJN	Joaquin Pujol...	Ship
THF	Miltiades ...	Ship	TJO	Lily TJO ...	Ship
THG	Criti ...	Ship	TJP	Manola...	Ship
THH	Nauplion ...	Ship	TJQ	Luis Casanova	Ship
THI	Katingo A.		TJR	Madrid...	Ship
	Lemou ...	Ship	TJS	Manu ...	Ship
THJ	Paralos ...	Ship	TJT	Mar Adriatico...	Ship
THK	Telemachos ...	Ship	TJU	Mar Blanco ...	Ship
THL	Alexandras		TJV	Mar Caribe ...	Ship
	Kaloutas ...	Ship	TJW	Mar del Plata...	Ship
THM	Margarita ...	Ship	TJX	Margari ...	Ship
THN	Marie Z.		TJY	Maria Elena ...	Ship
	Mchalinos ...	Ship	TJZ	Eugenio Dutrus	Ship
THO	Aristides ...	Ship	TKA	Mercurio ...	Ship
THP	Prodromos ...	Ship	TKB	Orzarosa ...	Ship
THQ	Kallirron Sapari	Ship	TKD	Peña Angustina	Ship
THR	Rosina ...	Ship	TKE	Peña Cabarga...	Ship
THS	Ioanna ...	Ship	TKF	Peña Rocias ...	Ship
THT	Argostoli ...	Ship	TKH	Previsor ...	Ship
THU	Assimina		TKI	Ramon de	
	Embericos ...	Ship		Bikuña ...	Ship
THV	Naxos ...	Ship	TKJ	Ramón Mumbrú	Ship
THW	Navarchos		TKK	Ramonita ...	Ship
	Koyndouriotis	Ship	TKL	Romeu ...	Ship
THX	Iocasti ...	Ship	TKM	Arola-Mendi ...	Ship
THY	Cephalonia THY	Ship	TKN	Rosendo Masia	Ship
THZ	Panaghis		TKO	S. Jose TKO ...	Ship
	Vergottis ...	Ship	TKP	S. Ana TKP ...	Ship
TIA	Alberto ...	Ship	TKQ	Sebastian ...	Ship
TIB	Principe de		TKR	Serafin Balles-	
	Asturias ...	Ship		teros...	Ship
TIC	Arenas TIC ...	Ship	TKS	Tablaca ...	Ship
TID	Armando TID	Ship	TKT	Teresa TKT ...	Ship
TIE	Arno Mendi ...	Ship	TKU	Torre Del Oro...	Ship
TIF	Arraiz ...	Ship	TKV	Valentin ...	Ship
TIF	Tiflis ...	Georgia	TKW	Valmurian ...	Ship
TIG	Bachi ...	Ship	TKX	Viuda de Llusá	Ship
TIH	Banana ...	Ship	TKY	Viva ...	Ship
THI	Banderas ...	Ship	TKZ	Villafranca ...	Ship
TIJ	Izaro ...	Ship	TLA	Elanchove ...	Ship
TIK	Ardantz-Mendi	Ship	TIB	Tarrasa ...	Ship
TIL	Bermeo ...	Ship	TLC	Concha...	Ship
TIM	Betis ...	Ship	TLD	Elcano TLD ...	Ship
TIN	Blas de Lezo ...	Ship	TLE	Alfonso Fierro...	Ship
TIO	Cabo Creus ...	Ship	TLF	Salazar...	Ship
TIP	Castro Alen ...	Ship	TLG	Tres Hermanos	Ship
TIQ	Berja ...	Ship	TLH	Aifonso Perez ...	Ship

TLI	Jeronimo Ibram	Ship	TNV	Arriaga-Mendi ..	Ship
TLJ	Anita ...	Ship	TNW	Avala-Mendi ...	Ship
TLK	Consuelo ...	Ship	TOA	Manuel Arnus...	Ship
TLI	Lolin ...	Ship	TOB	Alfonso XIII	
TLM	Tamesis	Ship	TOB		Ship
TLN	Mercedes TLN	Ship	TOC	Cristobal Colon	Ship
TLO	S. Salvador ...	Ship	TOD	Delfina TOD ...	Ship
TLP	Mar Azoff ...	Ship	TOF	Jose Estruch ...	Ship
TLQ	Inocencio		TOG	Salvador Gincer	Ship
	Figueroa ...	Ship	TOH	Poeta Arolas ...	Ship
TIR	Arza-Mendi ...	Ship	TOI	Guilem Sorolla	Ship
TLJ	Ariz-Mendi ...	Ship	TOJ	Conde de	
TLT	Guernica ...	Ship		Churruca ...	Ship
TLU	Alfredo...	Ship	TOK	Abodi-Mendi ...	Ship
TLV	Lanzarote ...	Ship	TOL	Aldube-Mendi...	Ship
TLW	Peña Labra ...	Ship	TOM	Pedrosa ...	Ship
TLX	Artxanda-Mendi	Ship	TON	Francisca	
TLY	Arnotegi-Mendi	Ship		Uravain ...	Ship
TLZ	Rio Galindo ...	Ship	TOO	Tom ...	Ship
TMA	Tifis ...	Ship	TOP	Artea-Mendi ...	Ship
TMB	Ignacio...	Ship	TOQ	Artibas Mendi...	Ship
TMC	Aizkarai-Mendi	Ship	TOR	Aya Mendi ...	Ship
TMD	S. Mus ...	Ship	TOR	Thorn ...	Germany
TME	Angela ...	Ship	TOS	Mari ...	Ship
TMF	Mar de Irlanda	Ship	TOT	Prado ...	Ship
TMG	Cabo Razo ...	Ship	TOU	Uralker ...	Ship
TMH	Cabo Huertas...	Ship	TOV	Altuna-Mendi...	Ship
TMI	Cabo Roche ...	Ship	TOW	Uribitarte ...	Ship
TMJ	Sac ...	Ship	TOX	Sabina ...	Ship
TMK	Atxeri-Mendi ...	Ship	TOY	Cristina TOY ...	Ship
TML	Alu-Mendi ...	Ship	TOZ	Maria Victoria...	Ship
TMM	Hamlin TMM...	Ship	TPA	Fram ...	Ship
TMN	Coria ...	Ship	TPB	Flint ...	Ship
TMO	Gelves TMO ...	Ship	TPC	Fritzöc...	Ship
TMP	Principe de		TPE	Delaware TPE	Ship
	Viana ...	Ship	TPF	Louisiana TPF	Ship
TMQ	Principe de		TPG	Mantilla TPG...	Ship
	Piamonte ...	Ship	TPH	Sekstant ...	Ship
TMR	Dulluns ...	Ship	TPI	Arnoy ...	Ship
TMR	Antonio TMR...	Ship	TPJ	Anders ...	Ship
TMS	Josefa TMS ...	Ship	TPK	Bertha ...	Ship
TMT	Oran ...	Ship	TPL	Estrella ...	Ship
TMU	Suarez No. 2 ...	Ship	TPM	Troubadour ...	Ship
TMV	Guadimir ...	Ship	TPN	Thode Fagelund	Ship
TMW	Santi ...	Ship	IPO	Sjomand ...	Ship
TMX	Mari-Tere ...	Ship	TPP	Sorland ...	Ship
TMY	Arinda-Mendi...	Ship	TPQ	Eidsfos...	Ship
TMZ	Manuchu ...	Ship	TPR	Hastings C'nty	Ship
TNA	Chivichiaga ...	Ship	IPS	Songa ...	Ship
TNB	Torrontero ...	Ship	TPT	Lorentz W.	
TNC	Agadir TNC ...	Ship		Hansen ...	Ship
TND	Suarez No. 1 ...	Ship	TRV	Loch Tay ...	Ship
TNE	Cisneros TNE...	Ship	TPW	Ambra ...	Ship
TNF	Antonio de		TPX	Visna ...	Ship
	Satrustegui ...	Ship	TPY	Sagatind ...	Ship
TNG	Arichachu ...	Ship	TOA	Gro ...	Ship
TNH	Sarita ...	Ship	TOB	Bur ...	Ship
TNI	Gobeo ...	Ship	TOC	Hassel ...	Ship
TNJ	Atalaya TNJ	Ship	TOD	Alfred Noble ...	Ship
TNK	Antolina Ponte	Ship	TOE	Elvenes ...	Ship
TNL	Gastelu ...	Ship	TOF	Corona TOF ...	Ship
TNM	Pura Rasilla ...	Ship	TOG	Tonjer ...	Ship
TNN	Eduardo ...	Ship	TOH	Nordkyn II ...	Ship
TNO	Santamana ...	Ship	TOI	S. B. Lund ...	Ship
TNP	Condado (El.)...	Ship	TOJ	Asator ...	Ship
TNQ	Montecillo (El.)	Ship	TOK	Nyhavn ...	Ship
TNS	Arantzazu-Mendi	Ship	TOL	Adour ...	Ship
TNT	Astoi-Mendi ...	Ship	TOM	Klem ...	Ship
TNU	Aguirre-Mendi...	Ship	TQN	Christian Krogn	Ship

TQO	Krøsfond ...	Ship	TTI	Trondhjemsfjord	Ship
TQP	Storfjeld ...	Ship	TTJ	Tanafjord ...	Ship
TQQ	Granli ...	Ship	TTK	Frogner ...	Ship
TQR	Lyderhorn ...	Ship	TTL	Aagot ...	Ship
TQS	Modica ...	Ship	TTM	Renteria ...	Ship
TQT	Hermes TQT ...	Ship	TTN	Papelera ...	Ship
TQU	Maridal ...	Ship	TTO	Oria ...	Ship
TQV	Osterdal ...	Ship	TTP	Navarra TTP ...	Ship
TQW	Eksjo ...	Ship	TTQ	Bogstad ...	Ship
TQX	Modig ...	Ship	TTT	Tatjana ...	Ship
TQY	Evanger ...	Ship	TTS	Modesta ...	Ship
TQZ	Malmanger ...	Ship	TTU	Skionstjord ...	Ship
TRA	S. Miguel TRA	Ship	TTV	Bratsberg ...	Ship
TRB	S. Jose TRB ...	Ship	TTW	Johanne Dybwad ...	Ship
TRC	Sardinia TRC	Ship	TTX	Lovland ...	Ship
TRD	S. Andres ...	Ship	TTY	Stokke ...	Ship
TRE	Sevilla TRE ...	Ship	TTZ	Albatross ...	Ship
TRF	Segovia ...	Ship	TUA	Teneriffa TUA	Ship
TRG	Ferro ...	Ship	TUB	Brei ...	Ship
TRH	Poljana ...	Ship	TUC	Stanja ...	Ship
TRI	Tosca ...	Ship	TUD	Starkad ...	Ship
TRI	Bratland ...	Ship	TUE	O. A. Knudsen	Ship
TRK	Theodore	Ship	TUF	Bretta ...	Ship
	Roosevelt TRK	Ship	TUG	Byna ...	Ship
TRL	Edvard Munch	Ship	TUH	Blasmyra ...	Ship
TRM	Lisgar County	Ship	TUI	Bövra ...	Ship
TRN	Gunnar Heiberg	Ship	TUJ	Begna ...	Ship
TRO	Nordfjeld ...	Ship	TUK	Bjoreia ...	Ship
TRP	Thorgerd ...	Ship	TUL	Bromma ...	Ship
TRO	Mimer ...	Ship	TUM	Torlak Skogland	Ship
TRR	H. K. Waage ...	Ship	TUN	Skaraas ...	Ship
TRS	Thorhild ...	Ship	TUO	Henrik Ibsen ...	Ship
TRT	Cissy ...	Ship	TUP	Berit ...	Ship
TRV	Gunny ...	Ship	TUQ	Braa ...	Ship
TRX	Solvaer ...	Ship	TUR	Bygdo ...	Ship
TRY	Leda ...	Ship	TUS	Brabant TUS	Ship
TRZ	Felix ...	Ship	TUT	Matti ...	Ship
TSA	Ronald ...	Ship	TUU	Perth TUU ...	Ship
TSC	Hermion ...	Ship	TUV	Ringborg ...	Ship
TSD	Tosto TSD ...	Ship	TUW	Maudie ...	Ship
TSF	S. Mateo TSF	Ship	TUX	Kjellbergen ...	Ship
TSG	Tungus ...	Ship	TUY	Ragi ...	Ship
TSH	Wilfred TSH ...	Ship	TUZ	Risvør ...	Ship
TSI	Cederic ...	Ship	TVA	Andijk ...	Ship
TSJ	Rowena TSJ ...	Ship	TVE	Beukelsdijk ...	Ship
TSK	Dagfred ...	Ship	TVC	Maasdijk TVC	Ship
TSK	Rosegg ...	Ship	TVD	Poeldijk ...	Ship
TSM	Margit Skogland	Ship	TVE	Sloterdijk ...	Ship
TSN	Ottar Jarl ...	Ship	TVF	Zijldijk ...	Ship
TSO	Marie Nielson	Ship	TVG	Vechtdijk TVG	Ship
TSP	Facto ...	Ship	TVH	Kinderdijk TVH	Ship
TSQ	Sneffjeld ...	Ship	TVI	Femdijk ...	Ship
TSR	Föina ...	Ship	TVJ	Moerdijk ...	Ship
TSS	Viking TSS ...	Ship	TVK	Stadsdijk ...	Ship
TST	Modum ...	Ship	TVL	Maasdam ...	Ship
TST	Fageraas ...	Ship	TVM	Leerdam ...	Ship
TSV	Kaggetos ...	Ship	TVN	Spaarndam ...	Ship
TSV	Fordefjord ...	Ship	TVO	Amstelstroom	Ship
TSW	Sangstad ...	Ship	TVQ	Drechtstroom	Ship
TSX	Conrad Mohr ...	Ship	TVS	Hontestroom ...	Ship
TSZ	Grey County ...	Ship	TVT	Jaarstroom ...	Ship
TTA	Anna TTA ...	Ship	TVU	Kilstroom ...	Ship
TTB	Haraldshaug ...	Ship	TVV	Texelstroom ...	Ship
TTC	Kronstad ...	Ship	TVX	Zaanstroom ...	Ship
TTD	Ada ...	Ship	TVZ	Ijselstroom ...	Ship
TTE	Dageid ...	Ship	TWA	Saleier ...	Ship
TTF	Huftero ...	Ship	TWB	Salabangka ...	Ship
TTG	Grande Gaard ...	Ship	TWC	Salawati ...	Ship
TTH	Kristianfjord	Ship	TWD	Simaloer ...	Ship

TWE	Saparoeca ...	Ship
TWF	Sembilan ...	Ship
TWG	Maduera ...	Ship
TWH	Manderan ...	Ship
TWI	Mapia ...	Ship
TWJ	Singkep ...	Ship
TWK	Moena ...	Ship
TWL	Soemba ...	Ship
TWM	Enggano ...	Ship
TWP	Merope ...	Ship
TWQ	Hermes TWQ ...	Ship
TWR	Haarlem ...	Ship
TWS	Hector TWS ...	Ship
TWT	Brielle ...	Ship
TWU	Breda TWU ...	Ship
TWV	Ares ...	Ship
TWW	Achilles TWW ...	Ship
TWY	Agamemnon ...	Ship
TWZ	Amor ...	Ship
TXA	Bacchus TXA ...	Ship
TXB	Calypso ...	Ship
TXC	Clio TXC ...	Ship
TXD	Hercules ...	Ship
TXE	Heemskerk ...	Ship
TXF	Mercurius ...	Ship
TXG	Minerva ...	Ship
TXH	Oberon ...	Ship
TXI	Pollox ...	Ship
TXJ	Saturnus ...	Ship
TXK	Stella TXK ...	Ship
TXL	Triton ...	Ship
TXM	Vestax TXM ...	Ship
TXN	Vulcanus ...	Ship
TXP	Helder TXP ...	Ship
TXQ	Deucalion TXQ ...	Ship
TXR	Rhea ...	Ship
TXS	Amsterdam	
	TXS ...	Ship
TXT	Poseidon TXT ...	Ship
TXU	Edam ...	Ship
TXV	Gaasterdijk ...	Ship
TXW	Grootendijk ...	Ship
IXX	Beemsterdijk ...	Ship
IXY	Breedijk ...	Ship
IXZ	Binnendijk ...	Ship
TYA	Elisabeth TYA ...	Ship
TYB	Magdalena ...	Ship
TYC	Cornelis ...	Ship
TYE	Yselhaven ...	Ship
TYF	Keilehaven ...	Ship
TYG	Wassenaar ...	Ship
TYH	Sassenheim ...	Ship
TYI	Waalhaven ...	Ship
TYJ	Veerhaven ...	Ship
TYK	Jobshaven ...	Ship
TYL	Parkhaven ...	Ship
TYM	Hillegom ...	Ship
TYN	Naaldwijk ...	Ship
TYO	Vreewijk ...	Ship
TYP	Katwijk ...	Ship
TYS	Gelderland TYS ...	Ship
TYT	Brabant TYT ...	Ship
TYU	Winsum ...	Ship
TYV	Wolsum ...	Ship
TYW	Hardenburg ...	Ship
TYX	Farmsum ...	Ship
TYY	Britsum ...	Ship
TYZ	Boomburg ...	Ship
TZA	Malang ...	Ship

TZB	Toba TZB ...	Ship
TZD	Rietfontein ...	Ship
TZG	Maasdijk ...	Ship
TZH	Eemdijk TZH ...	Ship
TZI	Molendijk ...	Ship
TZK	Beursplein ...	Ship
TZK	Alcor ...	Ship
TZL	Westplein ...	Ship
TZM	Bloemfontein	
	TZM ...	Ship
TZN	Nicolaas ...	Ship
TZO	Boshdijk ...	Ship
TZP	Burgerdijk ...	Ship
TZO	Blijdendijk ...	Ship
TZR	Vecht ...	Ship
TZS	Maas ...	Ship
TZT	Blommersdijk ...	Ship
TZU	Bilderdijk ...	Ship
TZV	Alcyone ...	Ship
TZW	Alchiba ...	Ship
TZY	Merak ...	Ship
TZZ	Albiero ...	Ship
UA	Nantes-Basse-	
	Lande ...	France
US	Swan Island ...	B.Honduras
UAA	Lieut. Fournaud	
UAE	-Figuig ...	Ship
UAR	Jura ...	Ship
UAU	Valevieux (Le)	
UAW	Marseillaise	
	UAW (La) ...	Ship
UAX	Givenchy UAX	
UAY	S. Léger ...	Ship
UAZ	C.I.P. ...	Ship
UBA	Hollandia UBA	
UBD	S. Camille ...	Ship
UBF	Kurt Woermann	
UBK	Walhall ...	Ship
UCM	Brasilia ...	Ship
UCN	Iowa UCN ...	Ship
UCO	Dusseldorf ...	Ship
UCQ	Freemantle ...	Ship
UCQ	Andromède ...	Ship
UCR	Min UCR ...	Ship
UCS	Kagera ...	Ship
UCS	Indiana UCS ...	Ship
UCT	Catinat ...	Ship
UCU	Gâtinais ...	Ship
UCZ	Kouroussa ...	Ship
UDA	Kribi ...	Ship
UDA	Alberte le	
	Borgne ...	Ship
UDC	Céphée ...	Ship
UDC	Buenos Aires	
	UDC ...	Ship
UDD	Austria UDD ...	Ship
UDE	Cap-Arcona ...	Ship
UDE	Angers ...	Ship
UDF	Chambord ...	Ship
UDF	Cap. Ortégat ...	Ship
UDG	General ...	Ship
UDG	Azay le Rideau	
UDH	Batavia ...	Ship
UDI	Macoris ...	Ship
UDK	Slavonia ...	Ship
UDK	Marigot ...	Ship
UDL	Cordoba UDL ...	Ship
UDM	Dinard ...	Ship
UDM	Baucis ...	Ship

UDR	Doris UDR ...	Ship	UIH	P.L.M. 14 ...	Ship
UDS	Alba UDS ...	Ship	UII	P.L.M. 15 ...	Ship
UDT	Styria ...	Ship	UIJ	P.L.M. 21 ...	Ship
UDU	Bourdonnais		UIK	Catherine	
	UDU (La) ...	Ship		Schiaffino ...	Ship
UDY	Mediterraneo ...	Ship	UIL	Laurent	
UEE	Secundus ...	Ship		Schiaffino ...	Ship
UEF	Jean-Jaques ...	Ship	UIM	Tigre UIM ...	Ship
UEF	Silesia ...	Ship	UIN	P.L.M. 22 ...	Ship
UEG	Wachtfels ...	Ship	UIO	Courbageau ...	Ship
UEG	Antinous UEG ...	Ship	UIP	Poitou ...	Ship
UEK	Teneriffa ...	Ship	UIQ	Saintonge ...	Ship
UEW	Tanger ...	Ship	UIQ	Ile de France ...	Ship
UEZ	Marechal Gallieni	Ship	UIR	Marie Anne ...	Ship
UFA	Linois ...	Ship	UIS	Marie Simonne ...	Ship
UFB	Si-Kiang ...	Ship	UIT	Marie Thérèse II ...	Ship
UFC	Lieutenant St.		UIU	Marie Yette ...	Ship
	Loubert-Bié ...	Ship	UIV	Marie Gilbert ...	Ship
UFC	Mannheim ...	Ship	UIW	Marie Mad ...	Ship
UFF	Mont Kemmel		UIX	Providencia ...	Ship
	UFF ...	Ship	UIY	Jim Butler ...	Ship
UFH	Dalny ...	Ship	UIZ	Argyll ...	Ship
UFI	Atlantica ...	Ship	UJD	Louise-Suzanne ...	Ship
UFJ	Aragonia ...	Ship	UJE	Etoile de L'est ...	Ship
UFN	Brisgavia ...	Ship	UJF	Adrien ...	Ship
UFN	Arkansas UFN ...	Ship	UJG	Kernevel ...	Ship
UFO	Burgermeister		UJH	Suzanne	
	Von Melle ...	Ship		Micheline ...	Ship
UFP	Belgrano UFP ...	Ship	UJI	Etoile Polaire ...	Ship
UFO	Buda ...	Ship	UJJ	S. Joachim ...	Ship
UFR	Martiniere ...	Ship	UJK	Duperre UJK ...	Ship
UFS	Eros UFS ...	Ship	UJL	Auguste et	
UFT	Euphemia ...	Ship		Denise ...	Ship
UFU	Foria ...	Ship	UJM	Crabe UJM ...	Ship
UFU	Elisabeth Brook	Ship	UJN	Louise	
UFX	Fangturn ...	Ship		Marguerite ...	Ship
UFY	Frida Horn ...	Ship	UJO	Jean UJO ...	Ship
UFZ	Grof Serenyi Bela ...	Ship	UJP	Pierre Andre ...	Ship
UGB	S. Carlo ...	Ship	UJQ	Flandre UJQ (La ...	Ship
UGN	S. Marco UGN ...	Ship	UJR	Brise (La) ...	Ship
UGP	Romanitza ...	Ship	UJS	Surmulet ...	Ship
UGO	Psyche ...	Ship	UJT	Touquet ...	Ship
UGR	Phryné... ...	Ship	UJU	Bar (Le) ...	Ship
UGS	Stilbe ...	Ship	UJV	Estelle Yvonne ...	Ship
UGU	Ville de Mazagan	Ship	UJW	Oued-Yquem ...	Ship
UHA	Madeleine ...	Ship	UJX	Oued Zem ...	Ship
UHB	Orient ...	Ship	UJY	P.L.M. 12 ...	Ship
UHC	Alcyon ...	Ship	UJZ	Magenta ...	Ship
UHE	Alsace UHE ...	Ship	UKA	Jeanne Marie ...	Ship
UHF	Champagne (La) ...	Ship	UKB	Marguerite UKB ...	Ship
UHH	Albertgallus ...	Ship	UKC	Wagram ...	Ship
UHI	Hellengallus ...	Ship	UKD	Friedland ...	Ship
UHM	Ouragan ...	Ship	UKE	Aimee ...	Ship
UHN	Tempete ...	Ship	UKF	Halicor ...	Ship
UHP	Typhon ...	Ship	UKG	Graziella UKG ...	Ship
UHR	P.L.M. 7 ...	Ship	UKH	Genevieve ...	Ship
UHS	P.L.M. 8 ...	Ship	UKI	Cecile ...	Ship
UHT	P.L.M. 10 ...	Ship	UKJ	Coucy UKJ ...	Ship
UHU	Arcturus UHU ...	Ship	UKK	Singe ...	Ship
UHV	Cap. Lopez ...	Ship	UKL	Ambroise Paré ...	Ship
UHX	Wessering ...	Ship	UKM	Mouette (La) ...	Ship
UIA	Michel Mazella	Ship	UKN	Jean-Frederic ...	Ship
UIB	P.L.M. 20 ...	Ship	UKN	Marie Thérèse ...	Ship
UIC	Nord African ...	Ship	UKO	Alexandrine ...	Ship
UID	Marius Chambon	Ship	UKP	Jubarte ...	Ship
UIE	Centaure UIE... ..	Ship	UKS	Cîte de Verdun ...	Ship
UIF	Mont Kemmel		UKT	Loki ...	Ship
	UIF ...	Ship	UKU	Avant-Garde ...	Ship
UIG	P.L.M. 13 ...	Ship	UKV	Liberte... ..	Ship

UKW	Cyclone ...	Ship	UQC	Ansaldo VIII ...	Ship
UKX	Cormoran ...	Ship	UQD	Carolina ...	Ship
UKY	Hiver ...	Ship	UQE	Aventino ...	Ship
UKZ	Andre et Louis ...	Ship	UQG	Robilante ...	Ship
ULC	Briseis ...	Ship	UQH	Roana ...	Ship
ULE	Otarie ...	Ship	UQI	Citta di Messina	Ship
ULF	Bassano ULF	Ship	UQJ	Monte Santo ...	Ship
ULG	Jean Dore ...	Ship	UQK	Dalmazia ...	Ship
ULH	Georgette ...	Ship	UQN	Adamello ...	Ship
ULK	Vaughin ...	Ship	UQP	S. Michele ...	Ship
ULL	P.L.M. 24 ...	Ship	UQQ	Celio ...	Ship
ULN	Jules Elby ...	Ship	UQR	Cracovia ...	Ship
ULP	Provence ULP		UQS	Recco ...	Ship
	(La) ...	Ship	UQT	Giovanna Florio	Ship
ULQ	Kerdonis ...	Ship	UQU	Ignazio Florio	Ship
ULR	Edouard		UQW	Carventum ...	Ship
	Watteau ...	Ship	UQX	Labicum ...	Ship
ULS	Sondra ...	Ship	UQY	Alatrium ...	Ship
ULU	Ursus ...	Ship	UQZ	Nomentum ...	Ship
ULV	Briwet ...	Ship	URA	Antium ...	Ship
UMA	Albi ...	Ship	URB	Ida Z.O. ...	Ship
UMB	Montauban ...	Ship	URE	Federica ...	Ship
UMC	Vendome ...	Ship	URG	Giulia ...	Ship
UMD	Janine ...	Ship	URH	Lodovica ...	Ship
UME	Laita ...	Ship	URI	Gerty ...	Ship
UMF	Kermelo ...	Ship	URJ	Georgia ...	Ship
UMG	Agen ...	Ship	URK	Thalia ...	Ship
UMI	Lorient ...	Ship	URN	Alcazar ...	Ship
UMK	Keryado ...	Ship	URO	Amilcare Cipriani	Ship
UML	Libourne ...	Ship	URP	Lanuvium ...	Ship
UMM	Kergoise ...	Ship	URU	Alga ...	Ship
UMO	Aurillac ...	Ship	URX	Africana ...	Ship
UMQ	Kerentrech ...	Ship	USD	Dandolo ...	Ship
UMW	Keroman ...	Ship	USE	Dardania ...	Ship
UMX	Adrien de		USF	Ellenia ...	Ship
	Montgolfier ...	Ship	USH	Filippo Artelli	Ship
UNK	Herzegnovi ...	Serbs,	USJ	Fedora ...	Ship
		Croates	USL	Gerania ...	Ship
		Slovenes	USM	Istria ...	Ship
UNS	Sibenik ...	Serbs,	USP	Laconia ...	Ship
		Croates	USQ	Levanzo ...	Ship
		Slovenes	UST	Manin ...	Ship
UPA	Mincio ...	Ship	USU	Mutlach ...	Ship
UPB	Oceania ...	Ship	USV	Numidia ...	Ship
UPC	Deiva ...	Ship	USW	Brunette ...	Ship
UPD	Cilicia ...	Ship	USY	Perseveranza ...	Ship
UPE	Gastein ...	Ship	USZ	Piave III ...	Ship
UPG	Galicia ...	Ship	UTB	Preneste ...	Ship
UPH	Giulio Cesare ...	Ship	UTD	Riva Trigoso ...	Ship
UPI	Arsa ...	Ship	UTF	Sirena ...	Ship
UPJ	Duchessa d'		UTG	Stella ...	Ship
	Aostra ...	Ship	UTI	Sirio ...	Ship
UPK	Isonzo ...	Ship	UTJ	Vejo ...	Ship
UPL	Rosandra ...	Ship	UTK	Nereide ...	Ship
UPM	Recca ...	Ship	UTL	Proteo ...	Ship
UPO	Lilyado ...	Ship	UTM	Olimpo ...	Ship
UPP	Ansaldo S.		UTN	Sicania ...	Ship
	Giorgio ...	Ship	UTO	Nelda ...	Ship
UPQ	Quirinale		UTP	Perseo ...	Ship
	Tuscolo ...	Ship	UTQ	Alfa ...	Ship
UPR	Ardea ...	Ship	UTR	Amerigo ...	Ship
UPS	Campidoglio ...	Ship	UTS	Anna ...	Ship
UPV	Dorsoduro ...	Ship	UTT	Alfieri ...	Ship
UPW	Vesta ...	Ship	UTU	Ardito ...	Ship
UPX	Gugliehno ...	Ship	UTW	Burma ...	Ship
UPY	Montenero ...	Ship	UTX	Carla ...	Ship
UPZ	Matilde Peirce	Ship	UTY	Gilda ...	Ship
UQA	Valdieri ...	Ship	UTZ	Java ...	Ship
UQB	Remo ...	Ship	UUB	Foce (La) ...	Ship

UUC	Maddalena O.	Ship	VBM	Le Pas ...	Canada
UUD	Giulia Peirce ...	Ship	VBN	Port Nelson ...	Canada
UUE	Teti ...	Ship	VBO	Mansel Island	Canada
UUL	Liberta ...	Ship	VBP	Saguenay ...	Ship
UUM	Absirtea ...	Italy	VBQ	Royalite ...	Ship
UVO	Mameli... ..	Ship	VBR	Sarnolite ...	Ship
UUP	Carducci ...	Ship	VBS	Iocolite ...	Ship
UUS	Alcardi... ..	Italy	VBU	Stadacona ...	Ship
UUU	Aussa ...	Italy	VBV	Hochelaga VBV	Ship
UUV	Caterina		VBZ	Gulnare ...	Ship
	Gerolimich ...	Ship	VCA	Montreal ...	Canada
UUX	Clara Camus ...	Ship	VCC	Quebec... ..	Canada
UUY	Generale Petiti	Ship	VCD	Grosse Isle ...	Canada
UUZ	Atlantico ...	Italy	VCE	Cape Race ...	Newf'dland
UVA	Batico ...	Ship	VCF	Father Point ...	Canada
UVB	Chlumecky ...	Ship	VCG	Fame Point ...	Canada
UVD	Mediterraneo ...	Ship	VCH	Rich Point ...	Newf'dland
UVE	Immacolata ...	Ship	VCI	Quebec... ..	Canada
UVF	Pincio ...	Ship	VCI	Heath Point	
UVG	Arimathea ...	Ship		Lightship ...	Canada
UVN	Rapallo ...	Ship	VCJ	Harrington ...	Canada
UVO	Gardenia ...	Ship	VCK	Clarke City ...	Canada
UVS	Adriatico ...	Ship	VCL	Armour Point	Newf'dland
UVT	Contessa Adelm	Ship	VCM	Belle Isle ...	Newf'dland
UVU	Piombino ...	Ship	VCN	Grindstone Island	Canada
UVV	Concordia ...	Ship	VCO	North Sydney... ..	Canada
UVW	Tirreno... ..	Ship	VCP	Cape Bear ...	Canada
UVX	Sampierdarena	Ship	VCQ	Pictou ...	Canada
UVY	Canova ...	Ship	VCS	Camperdown ...	Canada
UVZ	Zara ...	Ship	VCT	Sable Island ...	Canada
VB	Tegucifalpa ...	Ship	VCU	Cape Sable ...	Canada
VY	Yoro ...	Ship	VCV	Partridge Island	Canada
VAA	Halifax		VCW	Montreal ...	Ship
	Dockyard ...	Canada	VCY	Harold Dollar	Ship
VAB	Point Grey ...	Canada	VDE	Stanley VDE ...	Ship
VAC	Cape Lazo ...	Canada	VDF	Lady Laurier ...	Ship
VAD	Pachena Point	Canada	VDG	Aberdeen ...	Ship
VAE	Estevan ...	Canada	VDH	Druid ...	Ship
VAF	Albert Bay ...	Canada	VDJ	Montcalm VDJ	Ship
VAG	Triangle Island	Canada	VDK	Tyrian VDK ...	Ship
VAG	Bull Harbour ...	Canada	VDL	Lady Grey ...	Ship
VAH	Dead Tree Point	Canada	VDM	Arctic ...	Ship
VAI	Ikeda Head ...	Canada	VDN	Estevan ...	Ship
VAJ	Digby Island ...	Canada	VDO	Dollard ...	Ship
VAK	Gonzales Hill ...	Canada	VDP	Newington ...	Ship
VAL	Barrington		VDQ	Aranmore ...	Ship
	Passage ...	Canada	VDR	Lurcher Shoal	
VAM	Imperia ...	Ship		Lightship ...	Canada
VAS	St. John ...	Canada	VDS	Bellachasse ...	Ship
VAS	Vaslui ...	Roumania	VDT	Acadia ...	Ship
VAS	Glac Bay ...	Canada	VDU	Malaspina ...	Ship
VAS	Louisburg ...	Canada	VDW	Margaret VDW	Ship
VAV	Chebucto Head	Canada	VDZ	Sheba ...	Ship
VAW	High River ...	Canada	VEA	Dalhousie City	Ship
VAX	Canso ...	Canada	VEB	Corona VEB ...	Ship
VAY	Camp Borden	Canada	VEC	Kingston ...	Ship
VAZ	Cape Race ...	Newfound-land	VED	Toronto VED	Ship
			VEE	Melville Dollar	Ship
VBA	Port Arthur ...	Canada	VEF	Cape Trinity ...	Ship
VBB	Saulte Ste. Marie	Canada	VEG	Rapids King ...	Ship
VBC	Midland ...	Canada	VEH	Chippewa VEH	Ship
VBD	Tobermory ...	Canada	VEK	Macassa ...	Ship
VBE	Point Edward... ..	Canada	VEL	Cayuga VEL ...	Ship
VBF	Port Burwell ...	Canada	VER	Ontario No. 2	Ship
VBG	Toronto ...	Canada	VET	G. R. Crowe	Ship
VBH	Kingston ...	Canada	VEW	Glenshee ...	Ship
VBI	Riverton VBI	Ship	VEX	Charlton ...	Ship
VBJ	Glenlyon ...	Ship	VEY	Reginald ...	Ship
VBL	Glenfinnan ...	Ship	VFA	Princess Adelaide	Ship

VFB	Princess Mary...	Ship	VGDM	Monmouth	
VFC	Princess Beatrice	Ship		VGDM	Ship
VFD	Princess Alice	Ship	VGDN	Mapledawn	Ship
VFE	Princess		VGDP	Lady Sybil	Ship
	Charlotte	Ship	VGDO	Sylvia Victoria	Ship
VFG	Princess Royal	Ship	VGDR	Mapleton	Ship
VFH	Princess May	Ship	VGDS	Princess	
VFJ	Princess Ena			Victoria VGDS	Ship
	VFJ	Ship	VGDT	Canadian Runner	Ship
VFK	Tees	Ship	VGDW	Winona VGDW	Ship
VFL	Prince Albert	Ship	VGDX	Agawa	Ship
VFM	Prince John	Ship	VG DY	W. C. Franz	Ship
VFO	Bessie Dollar	Ship	VG DZ	Canadian Rover	Ship
VFP	Empire	Ship	VGFB	Maplecourt	Ship
VFQ	Alberta	Ship	VGFS	Eunice B.	Ship
VFX	Lord Strathcona	Ship	VGFW	Ormes	Ship
	VFX	Ship	VGJB	J. Frater Taylor	Ship
VFY	Harrison	Ship	VGJB	Home Smith	Ship
VFZ	Camosun	Ship	VGJC	Sarnian	Ship
VGC	Keewatin	Ship	VGJF	Restless VGJF	Ship
VGD	Harmonic	Ship	VGJK	Lord Strathcona	Ship
VGE	Huronic	Ship	VGJL	Canadian	
VGG	Athabasca	Ship		Commander	Ship
VGH	Manitoba VGH	Ship	VGJM	Albertolite	Ship
VGI	Assiniboia	Ship	VGJN	Calgarolite	Ship
VGJ	Prince Arthur	Ship	VGJP	Pathfinder VGJP	Ship
VGK	Prince George	Ship	VGJO	Glenmount	Ship
VGM	Imperial	Ship	VGJR	R. J. Skinner	Ship
VGN	Chelohsin	Ship	VGJS	Wisley	Ship
VGT	Princess		VGJT	Canadian	
	Maquinna	Ship		Squatter	Ship
VGU	Ontario No. 1	Ship	VGJW	Canadian Coaster	Ship
VGW	Noronic	Ship	VGJX	Canadian Leader	Ship
VGX	Venture	Ship	VGJY	South American	Ship
VGZ	Princess Patricia	Ship	VGJZ	North American	Ship
VGBC	Canadian		VGKJ	Reliance VGKJ	Ship
	Traveller	Ship	VGKM	Canadian Carrier	Ship
VGBD	City of Vancouver	Ship	VGLB	Canadian	
VGBF	Canadian			Observer	Ship
	Mariner	Ship	VGLC	Rapids Prince	Ship
VGBJ	Paipoonge	Ship	VGLD	Elmera...	Ship
VGBK	Canadian Sapper	Ship	VGLF	Canadian Otter	Ship
VGBL	Alphonse Racine	Ship	VGLJ	Vancolite VGLJ	Ship
VGBM	Canadian Fisher	Ship	VGLK	Victolite	Ship
VGBN	Oritana	Ship	VGLM	Esther Dollar	Ship
VGBP	Canadian Victor	Ship	VGLN	Canadian	
VGBQ	Canadian			Pathfinder	Ship
	Explorer	Ship	VGLP	Allanbee	Ship
VGBR	Anyox	Ship	VGLQ	Canadian	
VGBS	Julius Kessler	Ship		Engineer	Ship
VGBT	Canadian		VGLR	Lord Ormonde	Ship
	Forester	Ship	VGLS	Canadian Logger	Ship
VG BW	Canadian		VGLT	Canadian English	Ship
	Skirmisher	Ship	VGLT	Canadian	
VGBX	Canadian Hunter	Ship		Britisher	Ship
VGBY	Canadian		VGLW	Cape Eternity...	Ship
	Transporter...	Ship	VGLX	Canadian	Ship
VGBZ	Canadian			Conqueror	Ship
	Harvester	Ship	VGLY	Canadian	
VGDB	Canadian Winner	Ship		Challenger	Ship
VGDC	Canadian		VGLZ	Canadian	
	Highlander	Ship		Constructor	Ship
VGDF	Canadian		VGCB	Leebro	Ship
	Freighter	Ship	VGCD	Margaret	
VGDK	Canadian			Coughlan	Ship
	Scottish	Ship	VGCF	Rosecastle	Ship
VGDK	Canadian		VG CJ	Grace Dollar	Ship
	Reaper	Ship	VGCK	Klora	Ship
VGDL	Northumberland	Ship	VGCL	Wabana VGCL	Ship

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VGCM	M. S. Dollar ...	Ship	VIS	Sydney ...	Aust. Com.
VGCN	Vincent A. White	Ship	VIT	Townsville ...	Aust. Com.
VGCP	Saskatoon ...	Ship	VIU	Kieta Radio ...	New Guinea
VGCQ	F. H. Anson ...	Ship	VIV	Madang Radio	New Guinea
VGCR	Berryton ...	Ship	VIW	Wyndham ...	Aust. Com.
VGCT	Griffco VGCT	Ship	VIX	Misima Radio...	New Guinea
VGCW	Trucilla ...	Ship	VIY	Perth VIY ...	Ship
VGCX	Etta Mac ...	Ship	VIZ	Mount Gambier	Aust. Com.
VGNB	Canadian Cruiser	Ship	VJB	Roebourne ...	Aust. Com.
VGNC	Canadian		VJC	Riverina ...	Ship
	Trapper ...	Ship	VJD	Westralia ...	Ship
VGND	Semiramis		VJE	Zealandia ...	Ship
	VGND ...	Ship	VJF	Bingera ...	Ship
VGNF	G. Harrison		VJG	Cooma ...	Ship
	Smith ...	Ship	VJH	Morinda ...	Ship
VGNJ	Bayton ...	Ship	VJI	Wyreema ...	Ship
VGNL	Philip T. Dodge	Ship	VJJ	Loongana ...	Ship
VGNM	Princess Louise	Ship	VJK	Suva ...	Ship
VGNO	Robert Dollar	Ship	VJL	Aramac ...	Ship
VGNR	T. L. Church ...	Ship	VJM	Gilgai ...	Ship
VGNS	Rio Bonita ...	Ship	VJP	Werribee ...	Ship
VGNT	City of Victoria	Ship	VJQ	Alabama VJM	Ship
VGNW	Essex County	Ship	VJR	Bulla ...	Ship
VHA	Hobart... ..	Ship	VJS	Boonah ...	Ship
VHB	Levuka ...	Ship	VJT	Barambah ...	Ship
VHD	Kanowna ...	Ship	VJV	Bakara... ..	Ship
VHE	Karoola ...	Ship	VJW	Boorara ...	Ship
VHF	Bombala ...	Ship	VJY	Araluen ...	Ship
VHG	Emita ...	Ship	VJZ	Dongarra ...	Ship
VHH	Eromanga ...	Ship		Mindini ...	Ship
VHI	Iron Baron ...	Ship	VKA	Rabaul Radio	New Britain
VHJ	Erriba ...	Ship	VKB	Barunga ...	Ship
VHK	Wodonga ...	Ship	VKC	Merruwa ...	Ship
VHL	Dimboola ...	Ship	VKD	Miluna ...	Ship
VHM	Kangaroo ...	Ship	VKE	Aldinga ...	Ship
VHN	Katoomba ...	Ship	VKF	Aroona... ..	Ship
VHO	Canberra ...	Ship	VKG	Aeon VKF ...	Ship
VHP	Nairana ...	Ship	VKH	Wear VKG ...	Ship
VHQ	Fiona ...	Ship	VKI	Saros ...	Ship
VHR	Flora VHR ...	Ship	VKJ	Mallina ...	Ship
VHS	Maron ...	Hermit Is.	VKK	Chronos ...	Ship
VHT	Lady Loch ...	Ship	VKL	Century ...	Ship
VHU	Montoro ...	Ship	VKM	Monaro ...	Ship
VHV	Matarum ...	Ship	VKN	Woolgar ...	Ship
VHW	Yankalilla ...	Ship	VKO	Navy Office ...	Ship
VHX	Wyandra ...	Ship	VKP	Cerberus ...	Ship
VHY	Victoria VHX			Flinders Naval	
VHZ	Ulimaroa ...	Ship		Base ...	Ship
VIA	Baldina ...	Ship	VKQ	Garden Island	
VIB	Adelaide ...	Aust. Com.		Base ...	Ship
VIC	Brisbane ...	Aust. Com.	VKR	Cockburn Sound	
VID	Cooktown ...	Aust. Com.		Base ...	Ship
VIE	Darwin ...	Aust. Com.	VKS	Port Stevens	
VIF	Esperance ...	Aust. Com.		Base ...	Ship
	Woodlark Island		VKT	Nauru Radio ...	Marshall Islands
	Radio ...	New Guinea			
VIG	Port Moresby	New Guinea	VKU	Parattah ...	Ship
VIH	Hobart Radio	Aust. Com.	VKV	Arawatta ...	Ship
VII	Thursday Island	Aust. Com.	VKW	Ceduna ...	Ship
VIJ	Samarai Radio	New Guinea	VKX	Gouldburn ...	Ship
VIK	Time ...	Ship	VKY	Marsina ...	Ship
VIL	Flinders Island	Aust. Com.	VKZ	Burwah ...	Ship
VIM	Melbourne ...	Aust. Com.	VLA	Awanui ...	N. Zealand
VIN	Geraldton ...	Aust. Com.	VLB	Awanua ...	N. Zealand
VIO	Broome ...	Aust. Com.	VLC	Chatham Islands	Chatham Is.
VIP	Perth ...	Aust. Com.	VLD	Auckland Radio	N. Zealand
VIQ	Buninyong ...	Ship	VLH	Kaipoi ...	Ship
VIQ	Macquarie Island	N. Zealand	VLI	Kaitangata ...	Ship
VIR	Rockhampton...	Aust. Com.			

VLO	Kanna ...	Ship	VPK	Cocos ...	Cocos
VLS	Mapourika ...	Ship			Keeling Is.
VLT	Kaituna ...	Ship	VPL	Trinidad ...	British W.
VLW	Wellington ...	N. Zealand			Indies
VLX	Tutanekai ...	Ship	VPM	Tobago ...	British W.
VLY	Paloona ...	Ship			Indies
VMA	Arahura ...	Ship	VPN	Nassau ...	Bahamas
VMB	Karori ...	Ship	VPO	Barbados ...	British W.
VMC	Kauri ...	Ship			Indies
VMD	Koromiko ...	Ship	VPP	Belize ...	Honduras
VME	Rakanoa ...	Ship	VPQ	Mombasa ...	Kenya
VMF	Tarawera ...	Ship			Colony
VMG	Apia Radio ...	Samoa Is.	VPS	Cap D'Aguilar...	Hong Kong
VMH	Terawhiti ...	Ship	VPT	Malta Island ...	Malta
VMI	Rewa ...	Ship	VPU	Sierra Leone ...	Sierra
VML	Whangape ...	Ship			Leone
VMM	Monowai ...	Ship	VPW	Singapore Radio	S. Settle-
VMN	Katoa ...	Ship			ments
VMO	Waipori ...	Ship	VPX	Penang Radio...	S. Settle-
VMP	Wanaka ...	Ship			ments
VMR	Rarotonga ...	N. Zealand	VPY	Lagos ...	Nigeria
VMX	Rotomahana ...	Ship	VPZ	Zanzibar ...	Zanzibar
VMZ	Mararoa ...	Ship	VQA	Jesselton ...	British N.
VNA	Ludwig Weiner	Ship			Borneo
VNC	Capetown ...	S. Africa	VQB	Sandakan ...	British N.
VND	Durban ...	S. Africa			Borneo
VNE	Cape Cross ...	Ship	VQC	Tawao ...	British N.
VNF	Passen Island				Borneo
	Radio ...	S. Africa	VQD	Kudat ...	British N.
VNI	Durban, Jacobs,	S. Africa			Borneo
	Natal Radio		VQE	Pemba ...	Zanzibar
VNJ	Port Nolloth		VQF	Kuching ...	Sarawak
	Radio ...	S. Africa	VQG	Toco ...	British W.
VNL	Africshore ...	Ship			Indies
VNP	Apolda ...	Ship	VQI	Kingston ...	British W.
VNQ	Port Elizabeth				Indies
	Radio ...	S. Africa	VQK	Ocean Island ...	Gilbert &
VNR	Cape Recife ...	Ship			Ellis Is.
VNS	S. Africa ...	Ship	VQL	Savu, Savu ...	Fiji Islands
VNT	Cape Point ...	Ship	VQN	Fanning ...	Gilbert &
VNW	Wonganella ...	Ship			Ellis Is.
VOA	Battle Harbour	Newf'dland	VQP	Miri ...	Sarawak
VOB	Venison Island	Newf'dland	VQQ	Kismayu ...	Kenya
VOC	American Tickle	Newf'dland			Colony
VOD	Domino ...	Newf'dland	VQR	Serenli ...	Italian
VOE	Grady ...	Newf'dland			Som'land
VOF	Smokey Tickle	Newf'dland	VQS	Sankuri ...	Kenya
VOG	Holton ...	Newf'dland			Colony
VOH	Cape Harrison	Newf'dland	VQT	Wajheir ...	Kenya
VOI	Mokkovik ...	Newf'dland			Colony
VOJ	Fogo ...	Newf'dland	VQU	Moyale ...	Kenya
VOK	Ranger... ..	Ship			Colony
VOL	Glencoe ...	Ship	VQV	Sibu ...	Sarawak
VOM	Prospero ...	Ship	VQW	Sadong... ..	Sarawak
VON	Portia ...	Ship	VQX	Burao ...	British
VOQ	Diana ...	Ship			Som'land
VOR	Kyle ...	Ship	VQY	Las Dureh ...	British
VOU	Eagle ...	Ship			Som'land
VOV	Eskasoni ...	Ship	VQZ	Fox Bay ...	Falkland Is.
VOX	Neptune ...	Ship	VRE	Nile VRE ...	Ship
VPB	Colombo ...	Ceylon	VRH	Energie ...	Ship
VPC	Port Stanley ...	Falkland Is.	VRI	Parisian ...	Ship
VPD	Suva ...	Fiji Islands	VRJ	Powerful ...	Ship
VPE	Labasa ...	Fiji Islands	VRK	Labour Donnais	
VPF	Taviuni ...	Fiji Islands		(Tug) ...	Ship
VPG	Akkra ...	Gold Coast	VRK	Mauritius ...	Martinique
		Colony	VRL	Pioneer VRL ...	Ship
VPI	Aden Radio ...	Persian G.	VRM	Gibel Sarsar ...	Ship
VPJ	Berbera ...	Persian G.	VRN	Rescue ...	Ship

VRO	Sea King ...	Ship	VWBF	Bahrein ...	Ship
VRP	Isla de Luzon ...	Ship	VWBG	Hejaz ...	Ship
VRU	Fort Hamilton ...	Ship	VWBJ	Jeddah ...	Ship
VRV	Fort Victoria ...	Ship	VWBK	Koweit... ..	Ship
VRW	Fort St. George	Ship	VWBL	Loyalty ...	Ship
VRX	Maraval ...	Ship	VWBM	Ahmedi ...	Ship
VRY	Matura... ..	Ship	VWBN	John Sanderson	Ship
VRZ	Mayara ...	Ship	VWBS	Shushtar ...	Ship
VSA	Hargeisa ...	British Som'land	VWBX	Elphinstone	Ship
VSF	Nukualofa Radio	Tonga Is.	VWBY	Baluchi ...	Ship
VSC	Bimini ...	Bahamas	VWBZ	Pathan VWBZ	Ship
VSD	Goebilt... ..	Sarawak	VWCB	Seang Bee ...	Ship
VSE	Governors Harbour ...	Bahamas	VWCP	Pansy ...	Ship
VSI	Harbour Island	Bahamas	VWCR	Aungban ...	Ship
VSG	Inagua ...	Bahamas	VWCS	Singu ...	Ship
VTB	Bushire ...	Persian G.	VWCT	Beme ...	Ship
VTD	Diamond Island	Brit. India	VWDB	Jalapalaka	Ship
VTE	Bahrein ...	Persian G.	VWDC	Jalaputra ...	Ship
VTH	Henjam ...	Persian G.	VWDF	Jalavihar ...	Ship
VTJ	Jask * ...	Persian G.	VWDG	Jalavijaya ...	Ship
VTL	Lingah ...	Persian G.	VXA	Oonah ...	Ship
VTM	Maymyo Radio	Brit. India	VXB	Bambra ...	Ship
VTP	Port Blair ...	Brit. India	VXC	Period ...	Ship
VTR	Rangoon ...	Brit. India	VXD	Talawa... ..	Ship
VTV	Victoria Point	Brit. India	VXE	Dilga ...	Ship
VUA	Nearchus ...	Ship	VXF	Ashridge ...	Ship
VUB	Dufferin ...	Ship	VXG	Enoggera ...	Ship
VUC	Hardinge ...	Ship	VXH	Kooyong ...	Ship
VUD	Northbrook ...	Ship	VXI	Iron Monarch	Ship
VUE	Arratoon Apcar	Ship	VXJ	Kooringa ...	Ship
VUF	Catharine Apcar	Ship	VXK	Iron Prince ...	Ship
VUG	Japan VUG ...	Ship	VXL	Moirs ...	Ship
UHU	Akbar ...	Ship	VXM	Barwon ...	Ship
VUI	Firoozi ...	Ship	VXN	Ooma ...	Ship
VUJ	Homayun ...	Ship	VXO	Corio ...	Ship
VUK	Naderi ...	Ship	VXP	Dromana ...	Ship
VUL	Lightening ...	Ship	VXQ	Rona ...	Ship
VUM	Minto ...	Ship	VXR	Moorabool ...	Ship
VUN	Nairung ...	Ship	VXS	Yarra ...	Ship
VUO	Nurani ...	Ship	VXT	Delungra ...	Ship
VUP	Patrick Stewart	Ship	VXU	Dinoga ...	Ship
VUQ	Dara ...	Ship	VXV	Dumosa ...	Ship
VUR	Gregory Apcar	Ship	VXW	Dundula ...	Ship
VUS	Shuja ...	Ship	VXX	Mackarra ...	Ship
VUT	Investigator ...	Ship	VXY	Macumba ...	Ship
VUV	Clive ...	Ship	VYB	Terra Wova ...	Ship
VUW	Lawrence VUW	Ship	VYC	Viking ...	Ship
VUX	Dulhousie VUX	Ship	VYD	Sagona ...	Ship
VUY	Franz Ferdinand	Ship	VYE	Seal ...	Ship
VUZ	Kara Deniz ...	Ship	VYT	Meigle ...	Ship
VVO	Poona Radio ...	Brit. India	VYV	Thetis ...	Ship
VVP	Patna Radio ...	Brit. India	VZA	Camira ...	Ship
VWA	Allahabad Radio	Brit. India	VZB	Makambo ...	Ship
VWB	Bombay Radio	Brit. India	VZC	Cantara ...	Ship
VWC	Calcutta ...	Brit. India	VZD	Dilkera ...	Ship
VWD	Delhi Radio ...	Brit. India	VZE	King Island Radio ...	Aust. Com. Ship
VWG	Quetta Radio	Brit. India	VZF	June ...	Ship
VWH	Mhow Radio ...	Brit. India	VZG	Governor Musgrave ...	Ship
VWJ	Jutogh Radio	Brit. India	VZH	Karuah ...	Ship
VWK	Karachi Radio	Brit. India	VZI	Kadina ...	Ship
VWL	Lahore Radio	Brit. India	VZJ	Lammeroo ...	Ship
VWM	Madras ...	Brit. India	VZK	Morobe Radio...	N. Guinea
VWN	Nagfur Radio	Brit. India	VZL	Nardoo ...	Ship
VWP	Peshawar Radio	Brit. India	VZM	Carina ...	Ship
VWS	Sandheads ...	Brit. India	VZN	Tarcoola ...	Ship
VWX	Secunderabad Radio ...	Brit. India	VZO	Manus Radio ...	Admiralty Islands

VZP	Australpool ...	Ship	WBG	Venezuela ...	Ship
VZQ	Australcrag ...	Ship	WBH	Colombia ...	Ship
VZR	Kaewiang Radio ...	New Ireld	WBJ	S. Barbara ...	Ship
VZS	Australpeak ...	Ship	WBN	Ecuador ...	Ship
VZT	Australport ...	Ship	WBO	S. Rosa ...	Ship
VZU	Urilla ...	Ship	WBP	Hermosa ...	Ship
VZV	Calulu ...	Ship	WBQ	S. Paula ...	Ship
VZW	Australmead ...	Ship	WBR	S. Rita ...	Ship
VZX	Eitape Radio ...	N. Guinea	WBS	Newark ...	U.S.A.
VZY	Australmount ...	Ship	WBT	Charlotte ...	U.S.A.
VZZ	Marrawah ...	Ship	WBU	Chicago ...	U.S.A.
VZBC	Komura ...	Ship	WBV	Cabrillo ...	Ship
VZBD	Koonda ...	Ship	WBW	Burwood ...	U.S.A.
VZBF	Melbourne VZBF ...	Ship	WBX	S. Ana WBX ...	Ship
VZBJ	Hexham ...	Ship	WBY	Lima ...	U.S.A.
VZBK	Gabo ...	Ship	WBZ	Springfield ...	U.S.A.
VZBL	Poolta ...	Ship	WBAI	Heffron ...	Ship
VZBM	Era ...	Ship	WBAJ	Toledo ...	U.S.A.
VZBN	Omana ...	Ship	WBAL	Savannah ...	U.S.A.
VZBP	Coolana ...	Ship	WBAP	Fort Worth ...	U.S.A.
VZBQ	Warspray ...	Ship	WBAS	Orange ...	U.S.A.
VZBR	Moreton Bay ...	Ship	WBAU	Orange Field ...	U.S.A.
VZBS	Largs Bay ...	Ship	WBAV	Hamilton ...	U.S.A.
VZBT	Koolonga ...	Ship	WBAV	Columbus ...	U.S.A.
VZBU	Maindy Lodge ...	Ship	WBIA	Chipchung ...	Ship
VZBW	Hobsons Bay ...	Ship	WBUE	Lake Gravity ...	Ship
VZBX	Cycle ...	Ship	WBUE	Lake Greenbrier ...	Ship
WAA	Alameda WAA ...	Ship	WBUI	Lake Gretna ...	Ship
WAB	Saugerties ...	Ship	WBUO	Lake Grogan ...	Ship
WAC	Chicago WAC ...	Ship	WBUU	Lake Forney ...	Ship
WAD	Victoria ...	Ship	WCA	Tionesta ...	Ship
WAE	Ketchikan ...	Ship	WCB	Juniata WCB ...	Ship
WAF	Admiral ...	Ship	WCC	Marion ...	U.S.A.
	Farragut ...	Ship	WCD	Octorara ...	Ship
WAG	Admiral Seabee ...	Ship	WCF	Favorite WCF ...	Ship
WAH	Eldorado ...	U.S.A.	WCG	New York ...	U.S.A.
WAI	Latouche ...	Ship	WCH	Huron WCH ...	Ship
WAI	Philadelphia ...	U.S.A.	WCI	Barneget ...	U.S.A.
WAJ	Jefferson WAJ ...	Ship	WCJ	New Haven ...	U.S.A.
WAK	Valdez ...	Ship	WCK	S. Louis ...	U.S.A.
WAL	S. Ana WAL ...	Ship	WCL	Westchester ...	Ship
WAM	Juneau ...	Ship	WCM	Austin ...	U.S.A.
WAN	Northwestern ...	Ship	WCN	Worcester ...	U.S.A.
WAO	Rajah WAO ...	Ship	WCO	Wyandotte ...	Ship
WAP	Lake Crescent ...	Ship	WCP	Casco ...	Ship
WAQ	Democracy ...	Ship	WCR	Harvester WCR ...	Ship
WAR	Cordova ...	Ship		(The) ...	Ship
WAR	Warsaw ...	Poland	WCS	Alpena ...	Ship
WAS	Chester Sun ...	Ship	WCT	Theodore ...	Ship
WAT	Skagway ...	Ship		Roosevelt ...	Ship
WAU	Point Loma ...	Ship	WCU	Conneaut ...	Ship
WAV	Philippines ...	Ship	WCV	Fort Worth ...	U.S.A.
WAW	Admiral Watson ...	Ship	WCW	Woonsocket ...	Ship
WAY	Admiral Dewey ...	Ship	WCX	Detroit ...	U.S.A.
WAZ	Admiral Schley ...	Ship	WCY	Cape May ...	U.S.A.
WAAB	New Orleans ...	U.S.A.	WCZ	Illinois WCZ ...	U.S.A.
WAAD	Cincinnati ...	U.S.A.	WCAA	Tralee ...	U.S.A.
WAAF	Chicago ...	U.S.A.	WCAB	New Orleans ...	U.S.A.
WAAG	Shreveport ...	U.S.A.	WCAB	Newburgh ...	U.S.A.
WAAI	Shock ...	U.S.A.	WCAC	Fort Smith ...	U.S.A.
WAAK	Milwaukee ...	U.S.A.	WCAD	Canton ...	U.S.A.
WAAW	Omaha ...	U.S.A.	WCAF	Rogers ...	U.S.A.
WBA	S. Clara ...	Ship	WCAH	Columbus ...	U.S.A.
WBB	S. Cecilia ...	Ship	WCAJ	University Place ...	U.S.A.
WBC	New York ...	U.S.A.	WCAK	Houston ...	U.S.A.
WBD	S. Cruz ...	Ship	WCAL	Northfield ...	U.S.A.
WBD	Hermosa ...	Ship	WCAL	Jacksonville ...	U.S.A.
WBE	Cacique ...	Ship	WCAM	Villanova ...	U.S.A.
WBF	Boston ...	U.S.A.	WCAN	Jacksonville ...	U.S.A.

WCAO	Baltimore ...	U.S.A.	WDAQ	Brownsville ...	U.S.A.
WCAP	Decatur ...	U.S.A.	WDAS	Worcester ...	U.S.A.
WCAQ	Defiance ...	U.S.A.	WDAT	Worcester ...	U.S.A.
WCAR	Philadelphia ...	U.S.A.	WDAU	New Bedford ...	U.S.A.
WCAR	San Antonio ...	U.S.A.	WDAV	Muskogee ...	U.S.A.
WCAS	Minneapolis ...	U.S.A.	WDAW	Atlanta ...	U.S.A.
WCAT	Rapid City ...	U.S.A.	WDAX	Centerville ...	U.S.A.
WCAU	Philadelphia ...	U.S.A.	WDAY	Fargo ...	U.S.A.
WCAU	Pittsburgh ...	U.S.A.	WDEI	Crawl Keys ...	Ship
WCAV	Little Rock ...	U.S.A.	WDEO	Steadfast WDEO	Ship
WCAW	Quincy ...	U.S.A.	WDEU	Bayamo ...	Ship
WCAX	Burlington ...	U.S.A.	WDIA	South Pole ...	Ship
WCAY	Milwaukee ...	U.S.A.	WDIO	Westmead ...	Ship
WCAZ	Quincy ...	U.S.A.	WDIU	West View ...	Ship
WCEE	Kuwa ...	Ship	WDOA	Agwidale ...	Ship
WCIA	Bellingham ...	Ship	WDOE	Auburn ...	Ship
WCIE	Eastport ...	Ship	WDOI	Cape May ...	Ship
WCII	Invincible ...	Ship	WDOO	Federal WDOO	Ship
WCIO	Lake Lemando ...	Ship	WDOV	Fort Wayne ...	Ship
WCIU	Naiwa ...	Ship	WДУА	Lake Frazee ...	Ship
WCOE	Socony 84 ...	Ship	WDUD	Lake Freed ...	Ship
WCOI	Socony 92 ...	Ship	WDUI	Lake Freeborn ...	Ship
WCOO	Liberty WCOO	Ship	WDUU	Lake Freeland ...	Ship
WCOU	Lake Kytte ...	Ship	WEA	City of Cleveland	
WCUA	Lake Forsby ...	Ship		III ...	Ship
WCUE	Lake Fossil ...	Ship	WEC	City of Detroit II	Ship
WCUO	Lake Franconia ...	Ship	WED	Western States ...	Ship
WCUU	Lake Fray ...	Ship	WEE	Eastern States ...	Ship
WDA	Pere Marquette ...	Ship	WEF	City of Detroit	
WDB	Pere Marquette			III ...	Ship
	19 ...	Ship	WEG	City of St. Ignace	Ship
WDC	Pere Marquette		WEH	Tulsa ...	U.S.A.
	17 ...	Ship	WEI	E. J. Earling ...	Ship
WDD	Pere Marquette		WEJ	Samuel Mitchell	Ship
	18 ...	Ship	WEK	Minnesota ...	Ship
WDE	Pere Marquette		WEL	C. A. Smith ...	Ship
	20 ...	Ship	WEM	Susquehanna ...	Ship
WDE	Wathena ...	Ship	WEN	North America	Ship
WDF	Glendaruel ...	Ship	WEO	South American	Ship
WDG	Otsego ...	Ship	WEP	Western King ...	Ship
WDH	Petoskey ...	Ship	WER	Puget Sound ...	Ship
WDI	Watowan ...	Ship	WES	Point Adams ...	Ship
WDI	City of Miami	Ship	WET	West Gotsmska	Ship
WDL	Lakeland ...	Ship	WEU	Western Star ...	Ship
WDN	Ann Arbor No. 3	Ship	WEV	Houston ...	U.S.A.
WDN	Washington ...	U.S.A.	WEW	St. Louis ...	U.S.A.
WDO	Ann Arbor No. 4	Ship	WEX	Marquette and	
WDP	Ann Arbor No. 5	U.S.A.		Bessemer No. 2	Ship
WDQ	Ann Arbor No. 6	Ship	WEY	Wichita ...	U.S.A.
WDR	Ruth Alexander	Ship	WEZ	Ashtabula WEZ	Ship
WDT	New York ...	U.S.A.	WEAA	Flint ...	U.S.A.
WDU	Puritan ...	Ship	WEAB	Fort Dodge ...	U.S.A.
WDV	Omaha ...	U.S.A.	WEAC	Terre Haute ...	U.S.A.
WDX	Lake Tulare ...	Ship	WEAF	New York ...	U.S.A.
WDY	Roselle Park ...	U.S.A.	WEAG	Edgewood ...	U.S.A.
WDAA	Nashville ...	U.S.A.	WEAH	Wichita ...	U.S.A.
WDAB	Portsmouth ...	U.S.A.	WEAI	Ithaca ...	U.S.A.
WDAC	Springfield ...	U.S.A.	WEAJ	Wermilion ...	U.S.A.
WDAD	Lindsborg ...	U.S.A.	WEAK	St. Joseph ...	U.S.A.
WDAE	Tampa ...	U.S.A.	WEAM	North Plainfield	U.S.A.
WDAF	Kansas City ...	U.S.A.	WEOI	Manhattan Island	Ship
WDAG	Amarillo ...	U.S.A.	WFA	Georgia WFA	Ship
WDAH	El Paso ...	U.S.A.	WFB	Alabama WFB	Ship
WDAI	Syracuse ...	U.S.A.	WFC	Indiana WFC	Ship
WDAJ	College Park ...	U.S.A.	WFD	Flat Rock ...	U.S.A.
WDAK	Hartford ...	U.S.A.	WFE	Carolina WFE	Ship
WDAN	Shreveport ...	U.S.A.	WFF	Nevadan ...	Ship
WDAO	Dallas ...	U.S.A.	WFG	Arizona WFG	Ship
WDAP	Chicago ...	U.S.A.	WFH	Avalon WFH	Ship

WFI	Philadelphia ...	U.S.A.	WGIA	West Grama ...	Ship
WFJ	Christopher Columbus ...	Ship	WGIE	Nantahala ...	Ship
WFK	Frankfort ...	U.S.A.	WGOE	Polar Bear ...	Ship
WFL	Virginia Limited	Ship	WGOE	Garfield ...	Ship
WFM	Mexia ...	U.S.A.	WGOI	Sacarappa ...	Ship
WFN	Lake Butler ...	Ship	WGOO	Waubesa ...	Ship
WFO	Dayton ...	U.S.A.	WGOU	West Cressy ...	Ship
WFP	City of Erie ...	Ship	WGUA	Oskawa ...	Ship
WFO	City of Buffalo	Ship	WGUI	Brandywine ...	Ship
WFR	State of Ohio ...	Ship	WHA	Madison ...	U.S.A.
WFS	Seeandbee ...	Ship	WHB	Kansas... ..	U.S.A.
WFT	Charles O. Jenkins ...	Ship	WHC	Columbia WHC	Ship
WFO	F. B. Squire ...	Ship	WHD	Morgantown ...	U.S.A.
WFO	Sir Thomas Shaughnessy	Ship	WHE	Philadelphia ...	U.S.A.
WFW	Manitou WFW	Ship	WHF	Callao ...	Ship
WFX	Missouri ...	Ship	WHG	W. F. Burrows	Ship
WFY	Sialia ...	Ship	WHH	Mount Shasta	Ship
WFZ	Coronado WFZ	Ship	WHI	New York ...	U.S.A.
WFAE	West Galeta ...	Ship	WHJ	Gdansk ...	Ship
WFAI	West Hobomac	Ship	WHK	Cleveland ...	U.S.A.
WFAO	Volunteer ...	Ship	WHL	Ventura ...	Ship
WFEA	Eastern King ...	Ship	WHM	Sonoma WHM	Ship
WFED	Westport ...	Ship	WHN	Ridgewood ...	U.S.A.
WFEE	Windingz Golf ...	Ship	WHP	Point Arena ...	Ship
WFEL	West H-sokie	Ship	WHQ	Rochester ...	U.S.A.
WFEU	Matanzas ...	Ship	WHR	Abner Coburn...	Ship
WFH	Major Wheeler	Ship	WHS	Stanley Dollar	Ship
WFIU	Cerrito ...	Ship	WHU	Toledo ...	U.S.A.
WFOA	Hickman ...	Ship	WHV	Velero ...	Ship
WFOE	Lewis Luckenbach	Ship	WHW	East Lansing ...	U.S.A.
WFOO	William N. Page	Ship	WHX	Des Moines ...	U.S.A.
WFOU	Phoenix Bridge	Ship	WHY	Martinsville ...	U.S.A.
WFUA	Lake Freezout	Ship	WHZ	Johanna Smith	Ship
WFUE	Lake Frenchton	Ship	WIA	Silver Shell ...	Ship
WFUI	A. E. R. Schneider	Ship	WIB	Gold Shell ...	Ship
WFUU	Oshkosh ...	Ship	WIC	Pearl Shell ...	Ship
WGA	City of Seattle	Ship	WID	Charles E. Harwood	Ship
WGB	Ormidale ...	Ship	WIE	Edward L. Doheny	Ship
WGC	W. F. White ...	Ship	WIF	Herbert G. Wylie	Ship
WGD	Oregon WGD ...	Ship	WIG	Norman Bridge	Ship
WGE	Spokane ...	Ship	WIH	C. A. Canfield	Ship
WGF	Des Moines ...	U.S.A.	WII	New Brunswick	U.S.A.
WGG	Tuckerton ...	U.S.A.	WIJ	Edward L. Doheny, Jr.	Ship
WGI	Medford Hillside	U.S.A.	WIK	McKeesport ...	U.S.A.
WGI	Northland ...	Ship	WIL	Washington ...	U.S.A.
WGK	Curacao	Ship	WIM	Chatham ...	U.S.A.
WGL	Philadelphia ...	U.S.A.	WIN	Colusa ...	Ship
WGN	Carl. D. Bradley	Ship	WIO	Fort Morgan ...	U.S.A.
WGO	Cleveland ...	U.S.A.	WIP	Philadelphia ...	U.S.A.
WGO	City of Puebla	Ship	WIQ	Frederick R. Kellogg	Ship
WGR	Buffalo... ..	U.S.A.	WIR	Columbia WIR	Ship
WGS	Senator ...	Ship	WIS	E. R. Stirling	Ship
WGT	Western Pride	Ship	WIT	George G. Henry	Ship
WGU	Chicago ...	U.S.A.	WIU	Restorer ...	Ship
WGV	New Orleans ...	U.S.A.	WIV	Oscar D. Bennett	Ship
WGW	Vieques ...	Porto Rico	WIW	J. M. Danziger	Ship
WGX	Queen ...	Ship	WIX	Harold Walker	Ship
WGY	Schenactady ...	U.S.A.	WIY	William Green	Ship
WGZ	Guardian ...	Ship	WJA	Andalusia WJA	Ship
WGAA	Englewood ...	Ship	WJB	Lawrenceville	U.S.A.
WGAE	Galesburg ...	Ship	WJC	Owensboro ...	U.S.A.
WGAJ	Morristown ...	Ship	WJE	Skagit Power Site	U.S.A.
WGAO	Shreveport ...	Ship	WJF	Teresa ...	Ship
WGEA	Easterner ...	Ship	WJG	Porto Rico ...	Ship
WGEI	East Indian ...	Ship	WJH	Washington ...	U.S.A.

WJI	Atka Island ...	Alaska	WKEI	Lake Ypsilanti	Ship
WJK	Toledo ...	U.S.A.	WKEU	Borges ...	Ship
WJK	Taft ...	U.S.A.	WKII	Eastern Light	Ship
WJL	Wachusett ...	Ship	WKIO	Eastern Shore...	Ship
WJM	J. C. Donnell ...	Ship	WKIU	Eastern Cross	Ship
WJN	Munaires ...	Ship	WKOQ	Connerville ...	Ship
WJO	Nyanza WJO ...	Ship	WKUI	Western Belle	Ship
WJP	Tunica ...	Ship	WKUU	West Zeda ...	Ship
WJR	W. M. Tupper ...	Ship	WLA	Benj. F. Packard	Ship
WJS	Amphion ...	Ship	WLB	Minneapolis ...	U.S.A.
WJT	Erie ...	U.S.A.	WLC	New London ...	U.S.A.
WJT	Bakersfield ...	U.S.A.	WLD	Ludington ...	U.S.A.
WJU	Commercial		WLE	Maitland No. 1	Ship
	Pathfinder ...	Ship	WLF	Coosa ...	Ship
WJV	Guaro ...	Ship	WLG	Yucatan ...	Ship
WJW	Wyandotte ...	Ship	WLH	Fort Bragg ...	Ship
WJX	New York ...	U.S.A.	WLI	West Brook ...	Ship
WJZ	Newark ...	U.S.A.	WLJ	Monticello ...	Ship
WJAA	Sangamon ...	Ship	WLK	Indianapolis ...	U.S.A.
WJAI	Yuma ...	Ship	WLL	Greenwood ...	Ship
WJAO	M. J. Scanlon	Ship	WLM	Warszawa ...	Ship
WJAV	Princeton ...	U.S.A.	WLN	Black Arrow ...	Ship
WJEI	Plainfield ...	Ship	WLO	Orion ...	Ship
WJEO	Phoenix WJEO	Ship	WLP	Minneapolis ...	U.S.A.
WJIA	West Zucker ...	Ship	WLO	Sabine Sun ...	Ship
WJIE	Guimba ...	Ship	WLR	Floridian ...	Ship
WJII	Oskaloosa ...	Ship	WLS	President Arthur	Ship
WJIO	Independence	Ship	WLT	Neuse ...	Ship
WJIU	Schenectady ...	Ship	WLU	Pawnee ...	Ship
WJOA	West Elcasco ...	Ship	WLV	Ida WLV ...	Ship
WJOE	West Eldara ...	Ship	WLW	Cincinnati ...	U.S.A.
WJOI	West Loquassuck	Ship	WLX	Pequot WLX ...	Ship
WJOQ	West Madaket	Ship	WLY	Poznam ...	Ship
WJOU	West Kyska ...	Ship	WLA	Sarcouxie ...	Ship
WJUI	Cohasset ...	Ship	WLAC	Raleigh ...	U.S.A.
WJUO	Magunkook ...	Ship	WLAE	Barlow ...	Ship
WKA	Alaskan ...	Ship	WLAI	Lake Grandon	Ship
WKB	Arizonan ...	Ship	WLAU	Lake Fluvanna	Ship
WKC	Baltimore ...	U.S.A.	WLEA	Lake Farge ...	Ship
WKD	Dakotan ...	Ship	WLEE	Lake Faristell	Ship
WKE	Kentuckian ...	Ship	WLEI	Lake Forkville	Ship
WKF	American WKF	Ship	WLEO	Lake Cathoon	Ship
WKG	S. M. Spalding	Ship	WLEU	Lake Fugard ...	Ship
WKH	Hollywood WKH	Ship	WLIA	S. Teresa ...	Ship
WKH	Norfolk ...	U.S.A.	WLII	Goree ...	Ship
WKJ	Iowan ...	Ship	WLIO	Nantasket ...	Ship
WKK	Ceiba ...	Porto Rico	WLKZ	Montpelier ...	Ship
WKL	Mexican ...	Ship	WLOO	Cadaretta ...	Ship
WKM	Minnesotan ...	Ship	WLOU	Barhamstead ...	Ship
WKN	Memphis ...	U.S.A.	WLUI	Alamosa ...	Ship
WKP	Pennsylvania ...	Ship	WLUO	Alcona ...	Ship
WKQ	Ohioan ...	Ship	WLUU	Ingold ...	Ship
WKR	Panaman ...	Ship	WMA	Multnomah ...	Ship
WKS	West Arrow ...	Ship	WMC	Youngstown ...	U.S.A.
WKT	Texan ...	Ship	WMD	West Shore ...	Ship
WKU	Hawaiian ...	Ship	WME	Rockland ...	U.S.A.
WKV	Virginian ...	Ship	WMF	Celilo ...	Ship
WKW	Absaroka ...	Ship	WMG	Wapama ...	Ship
WKX	Westward Ho!	Ship	WMH	Cincinnati ...	U.S.A.
WKY	Oklahoma ...	U.S.A.	WMI	Minnesota ...	Ship
WKZ	Canoga ...	Ship	WMJ	Ernest H. Meyer	Ship
WKA	Socony 85 ...	Ship	WMK	Haydes ...	Ship
WKA	Lake Zaliski ...	Ship	WML	Lurline ...	Ship
WKAP	Western Hope	Ship	WMM	Freeman ...	Ship
WKAU	Cranston ...	U.S.A.	WMN	Enterprise WMN	Ship
WKEA	Lake Copley ...	Ship	WMO	Wilhelmina ...	Ship
WKEA	Lake Deval ...	Ship	WMP	Matsonia ...	Ship
WKED	Goodspeed ...	Ship	WMQ	Manoa WMQ ...	Ship
WKEE	Lake Cahoon ...	Ship	WMR	Maul ...	Ship

WMS	Wahkeena ...	Ship	WOH	S. M. Fischer ...	Ship
WMT	Point Bonita ...	Ship	WDH	Indianapolis ...	U.S.A.
WMU	Washington ...	U.S.A.	WOJ	Iris ...	Ship
WMV	Kermit ...	Ship	WOK	Pine Bluff ...	U.S.A.
WMW	Manitowoc ...	U.S.A.	WOL	Angeles (Los)	
WMY	A. M. Byers ...	Ship		WOL ...	Ship
WMZ	Honolulu ...	Ship	WOM	William A.	
WMAA	Lake Furley ...	Ship		McKenney ...	Ship
WMAE	Cowanshannock ...	Ship	WOO	Philadelphia ...	U.S.A.
WMAI	Makena ...	Ship	WOP	Lake Elizabeth ...	Ship
WMAO	Cowee ...	Ship	WOQ	Kansas ...	U.S.A.
WMEA	Costilla ...	Ship	WOR	Newark ...	U.S.A.
WMEE	Cote Blanche ...	Ship	WOS	Jefferson City ...	U.S.A.
WMEI	Cotopaxi ...	Ship	WOT	Coalinga ...	Ship
WMEU	Cottonplant ...	Ship	WOU	Omaha ...	U.S.A.
WMID	Cotton wood ...	Ship	WOV	Venetia ...	Ship
WMIU	W. H. McGean ...	Ship	WOW	Henry J. Biddle ...	Ship
	Charles L.		WOX	Levi G. Burgess ...	Ship
	Hutchinson ...	Ship	WOY	Queen II ...	Ship
WMOA	Tillamook ...	Ship	WOZ	Richmond ...	U.S.A.
WMUA	Lake Lasang ...	Ship	WPA	Fort Worth ...	U.S.A.
WMUE	Lake Larga ...	Ship	WPC	Tyce ...	Ship
WMUE	Cokato ...	Ship	WPD	Tampa ...	U.S.A.
WMUI	Charlot ...	Ship	WPF	Flagship Div. 1	
WMUO	Panola ...	Ship		Camp Eustis ...	U.S.A.
WNA	Springfield ...	U.S.A.	WPG	New Lebanon ...	U.S.A.
WNB	Capitan (El) WNB	Ship	WPI	Yomachichi ...	Ship
WNC	Wabash ...	Ship	WPK	Florence Olson ...	Ship
WND	Windber ...	Ship	WPM	Washington ...	U.S.A.
WNE	Nushagak ...	Ship	WPN	Pioneer ...	Ship
WNF	Hattie		WPO	Wilcox ...	Ship
	Luckenbach ...	Ship	WPO	Memphis ...	U.S.A.
WNG	Otto M. Reiss ...	Ship	WPQ	Zapora ...	Ship
WNG	Frederick Ewing ...	Ship	WPR	Ensenada ...	Porto Rico
WNH	Clemens A. Reiss ...	Ship	WPS	Starr ...	Ship
WNI	William A. Reiss ...	Ship	WPT	Norfolk ...	U.S.A.
WNK	Richard J. Reiss ...	Ship	WPV	H. M. Whitney ...	Ship
WNL	Lake St. Clair ...	Ship	WPW	James S.	
WNM	Florence			Whitney ...	Ship
	Luckenbach ...	Ship	WPX	Oneonta ...	Ship
WNN	Belfast ...	U.S.A.	WPY	Wallula ...	Ship
WNO	Jersey City ...	U.S.A.	WPZ	Springwells ...	U.S.A.
WNR	Rush ...	Ship	WPEA	Belamquan ...	Ship
WNU	New Orleans ...	U.S.A.	WPJA	Corilla ...	Ship
WNV	Hatteras ...	Ship	WPJE	Corrales ...	Ship
WNW	S. Ramon ...	Ship	WPJH	Corsicana ...	Ship
WNX	Peter Reiss ...	Ship	WPIU	Lake Fouché ...	Ship
WNY	New York ...	U.S.A.	WPOO	Wash Tenaw ...	Ship
WNY	Albany ...	U.S.A.	WPUE	Caddopeak ...	Ship
WNZ	F. J. Luckenbach ...	Ship	WPUI	Callabas ...	Ship
WNA	Craincreek ...	Ship	WPUO	Cascade ...	Ship
WNAE	Cranenest ...	Ship	WPUU	Coaxet ...	Ship
WNAI	Craycroft ...	Ship	WQA	Tipton ...	Ship
WNAO	Lake Callicoon ...	Ship	WQD	Hisko ...	Ship
WNAU	Lake Fresco ...	Ship	WQE	Harvey H.	
WNEA	Lake Charlotesville ...	Ship		Brown ...	Ship
	Dio ...	Ship	WQF	H. W. Croft ...	Ship
WNEO	Agawam ...	Ship	WQG	Fayette Brown ...	Ship
WNIE	Challenger ...	Ship	WQH	M. A. Bradley ...	Ship
WNII	Python ...	Ship	WQI	Costa Rica ...	Ship
WNIO	Cornucopia ...	Ship	WQK	Saint James ...	U.S.A.
WNIU	Blakeley ...	Ship	WQL	Coram Hill ...	U.S.A.
WNUE	Brookdale ...	Ship	WQQ	Rappahannock ...	Ship
WNUO	Admiral Rodman ...	Ship	WQR	Nansemond ...	Ship
WOA	Rock Island ...	U.S.A.	WQS	Artemis WQS ...	Ship
WOC	Beaumont ...	U.S.A.	WQT	Watauga ...	Ship
WOD	Horace X. Baxter ...	Ship	WQU	Cuba WQU ...	Ship
WOF	Fred Baxter ...	Ship	WQW	Jeannette	
WOG				Skinner ...	Ship

WQX	Chicago ...	U.S.A.	WST	New London ...	U.S.A.
WQZ	West Eagle ...	Ship	WST	Rockland ...	U.S.A.
WQEA	Lithopolis ...	Ship	WSU	Republic ...	Ship
WQEE	Everglades ...	Ship	WSW	Willamette ...	Ship
WQEO	West Zula ...	Ship	WSY	Birmingham ...	Alaska
WQEU	Canibas ...	Ship	WSZ	Bremerton ...	Ship
WQIA	Mexoil ...	Ship	WSEA	Defiance ...	Ship
WQII	Holbrook ...	Ship	WSEE	W. W. Steed ...	Ship
WQIO	Neponset ...	Ship	WSEI	Cricket WSEI ...	Ship
WQUA	Cokesit ...	Ship	WSEO	Lake Fondulac ...	Ship
WQUU	Jacona ...	Ship	WSEU	Lake Buckeye ...	Ship
WRA	O. A. Hermanson ...	Ship	WSOI	West Sequana ...	Ship
WRD	D. G. Scofield ...	Ship	WSOO	Crathorne ...	Ship
WRE	J. A. Moffett ...	Ship	WSUU	Lake Gradan ...	Ship
WRF	Amelia ...	Ship	WTD	Oleum ...	Ship
WRG	Annetta ...	Ship	WTE	Tamesi ...	Ship
WRH	Harvard ...	Ship	WTF	Westwood ...	Ship
WRI	Paraiso ...	Ship	WTG	Lansing ...	Ship
WRJ	Admiral Goodrich ...	Ship	WTH	West Lake ...	Ship
WRK	Hamilton ...	U.S.A.	WTI	Swans Island ...	U.S.A.
WRL	Schenectady ...	U.S.A.	WTJ	Sutherland ...	Ship
WRM	Urbana ...	U.S.A.	WTK	Paris ...	U.S.A.
WRN	Siboney ...	Ship	WTL	Lyman Stewart ...	Ship
WRP	Camden ...	U.S.A.	WTM	W. S. Porter ...	Ship
WRQ	Middlesex ...	Ship	WTN	Wm. F. Herrin ...	Ship
WRO	Marion ...	U.S.A.	WTO	Frank H. Buck ...	Ship
WRR	Dallas ...	U.S.A.	WTP	Bay City ...	U.S.A.
WRS	Suffolk WRS ...	Ship	WTQ	Segundo (El) ...	Ship
WRT	New Brunswick ...	U.S.A.	WTR	Richmond WTR ...	Ship
WRV	Alliance ...	Ship	WTS	Col. E. L. ...	Ship
WRW	Tarrytown ...	U.S.A.		Drake ...	Ship
WRX	Ozama ...	Ship	WTT	Atlas ...	Ship
WRY	Yale ...	Ship	WTV	Captain A. F. ...	Ship
WRZ	Rainier ...	Ship		Lucas ...	Ship
WRAE	Alabama WRAE ...	Ship	WTW	Ossineke ...	Ship
WRAI	Allegheny WRAI ...	Ship	WTX	Asuncion ...	Ship
WREA	West Lashaway ...	Ship	WTY	S.O.Co. No. 93 ...	Ship
WREE	Wauconda ...	Ship	WTZ	S.O.Co. No. 95 ...	Ship
WREI	Quistconck ...	Ship	WTAA	Lake Beacon ...	Ship
WREO	Zirkel ...	Ship	WTAE	Lake Desha ...	Ship
WREU	Governor John ...	Ship	WTAI	Lake Mattato ...	Ship
	Lund ...	Ship	WTAO	Lake Licogo ...	Ship
WRIE	Lake Gorin ...	Ship	WTEE	Cedar Spring ...	Ship
WRIO	Star 1 ...	Ship	WTEI	Ceralvo ...	Ship
WROA	West Pool ...	Ship	WTEO	Cerosco ...	Ship
WROI	Lydia ...	Ship	WTEU	Coperas ...	Ship
WROO	E. L. Doheny ...	Ship	WTHI	Socony 90 ...	Ship
	Third ...	Ship	WTIU	Deerfield ...	Ship
WRUO	Quittacas ...	Ship	WTOO	Toiler ...	Ship
WSA	West Helix ...	Ship	WTOU	Coulee ...	Ship
WSA	East Hampton ...	U.S.A.	WTUE	Laurel WTUE ...	Ship
WSB	Atlanta ...	U.S.A.	WTUI	Calvert ...	Ship
WSC	Siasconset ...	U.S.A.	WTUO	Houma ...	Ship
WSD	Redwood ...	Ship	WTUU	West Mahomet ...	Ship
WSE	West Wauna ...	Ship	WUA	Fort Andrews ...	U.S.A.
WSE	East Moriches ...	U.S.A.	WUB	Fort Hancock ...	U.S.A.
WSF	Agnes Dollar ...	Ship	WUC	Fort H. G. Wright ...	U.S.A.
WSG	Norwood ...	Ship	WUD	Fort ...	
WSI	West Wauneke ...	Ship		Leavenworth ...	U.S.A.
WSI	S. Inez ...	Ship	WUE	Fort Levett ...	U.S.A.
WSJ	Edna Christenson ...	Ship	WUF	Fort Monroe ...	U.S.A.
WSK	New York ...	U.S.A.	WUG	Marfa ...	U.S.A.
WSL	Utica ...	U.S.A.	WUG	Camp Marfa ...	U.S.A.
WSM	Fair Oaks ...	Ship	WUI	Fort Riley ...	U.S.A.
WSO	Marion ...	U.S.A.	WUJ	Fort Sam ...	
WSP	Westhampton ...	Ship		Houston ...	U.S.A.
WSQ	Vizcaya ...	Ship	WUK	Fort Stevens ...	U.S.A.
WSR	Reuce ...	Ship	WUL	Fort Totten ...	U.S.A.
WSS	S. Nicholas ...	Ship	WUN	Fort Worden ...	U.S.A.

WUO	Fort Winfield	U.S.A.	WVOU	Coutolene ...	Ship
WUQ	Scott ...	China	WVUA	Courageous ...	Ship
WUR	Tientsin ...	U.S.A.	WWA	WVUA ...	Ship
WUS	Fort Morgan ...	U.S.A.	WWB	China WWA ...	Ship
WUT	Fort Rosecrans ...	U.S.A.	WWC	Canton ...	U.S.A.
WUV	Fort Caswell ...	Alaska	WWD	Western Wave ...	Ship
WUX	Livengood ...	U.S.A.	WWE	Arcadia ...	Ship
WUY	Fort Crockett ...	U.S.A.	WWF	Manchuria ...	Ship
WUZ	Fort San Jacinto ...	U.S.A.	WWH	City of Para ...	Ship
WUAB	Fort Brown ...	U.S.A.	WWI	Newport WWH ...	Ship
WUAC	Cadmus ...	Ship	WWJ	Dearborn ...	U.S.A.
WUAD	Gypsum Prince ...	Ship	WWK	Detroit ...	U.S.A.
WUAE	Gwalla ...	Ship	WWL	Western Queen ...	Ship
WUAJ	Tacony ...	Ship	WWM	S. Jose ...	Ship
WUAK	Manila ...	Philippine Islands	WWN	S. Juan ...	Ship
WUAL	Fort Wint ...	Philippine Islands	WWP	Mongolia ...	Ship
WUBA	Fort Drum ...	Philippine Islands	WWQ	Ausable ...	Ship
WUBC	Camp Alfred	U.S.A.	WWR	Bellefonte ...	U.S.A.
WUBD	Vail ...	U.S.A.	WWR	Rose City ...	Ship
WUCA	Camp Knox ...	U.S.A.	WWT	Wau ...	Sudan
WUCB	Fort Sill ...	Philippine Islands	WWU	Buffalo ...	U.S.A.
WVA	Camp ...	Philippine Islands	WWZ	Newark ...	U.S.A.
WVB	Stotsenburg	Alaska	WXA	New York ...	U.S.A.
WVC	Camp John Hay	Alaska	WXD	Buford WXA ...	Ship
WVD	Circle ...	Alaska	WXE	West Newark ...	Ship
WVE	Fairbanks ...	Alaska	WXF	Meigs ...	Ship
WVG	Fort Egbert ...	Alaska	WXG	Liseum ...	Ship
WVH	Fort Gibbon ...	Alaska	WXI	Logan ...	Ship
WVI	St. Michael ...	Alaska	WXJ	Fort Washington	U.S.A.
WVG	Nome ...	Alaska	WXK	Meritt ...	Ship
WVH	Nulato ...	Alaska	WXL	Sheridan WXJ	Ship
WVI	Kotlik ...	Alaska	WXM	Sherman WXK	Ship
WVJ	Bethel ...	Alaska	WXN	Funter ...	Alaska
WVK	Wrangell ...	Alaska	WXP	Iditarod ...	Alaska
WVL	Holy Cross ...	Alaska	WXO	Thomas ...	Ship
WVM	Fort Frank ...	Philippine Islands	WXX	Warren ...	Ship
WVN	Noorvik ...	Alaska	WXX	Craig ...	Alaska
WVO	Fort Mills ...	Philippine Islands	WXX	Fort Travis ...	U.S.A.
WVP	Boston ...	U.S.A.	WXX	Morgan Lewis	Ship
WVQ	Governors Island	U.S.A.	WXX	Burnside ...	Ship
WVR	Fort Howard ...	U.S.A.	WXX	Slocum ...	Ship
WVS	Fort McPherson	U.S.A.	WXX	Joseph Henry	Ship
WVT	Fort Benjamin	U.S.A.	WXX	Navesink ...	Ship
WVU	Harrison ...	U.S.A.	WXX	McGrath ...	Alaska
WVV	Chicago ...	U.S.A.	WXX	General John M.	Ship
WVV	Fort Omaha ...	U.S.A.	WXX	Schofield ...	Ship
WVV	Jefferson	U.S.A.	WXX	Fort Yukon ...	Alaska
WVV	Barracks ...	U.S.A.	WXX	Ozaukee ...	Ship
WVV	Fort D.A. Russel	U.S.A.	WXX	Western Scout	Ship
WVV	Fort Douglas ...	U.S.A.	WXX	Western Comet	Ship
WVV	S. Francisco ...	U.S.A.	WXX	West Cape ...	Ship
WVA	Coquina ...	Ship	WXX	Yukon ...	Ship
WVA	Cora Peak ...	Ship	WXX	Victorious ...	Ship
WVA	Nancy Weems	Ship	WXX	W. J. Crosby ...	Ship
WVA	Conotton ...	Ship	WXX	Penobscot	Ship
WVA	Contoocook ...	Ship	WXX	WXOI ...	Ship
WVE	Basco ...	Ship	WXX	Craigsmere ...	Ship
WVE	Isanti ...	Ship	WXX	Hampden ...	Ship
WVI	Lake Gorman	Ship	WXX	Monmouth ...	Ship
WVI	Lake Govan ...	Ship	WXX	Mitchell Field	U.S.A.
WVO	Elecedro ...	Ship	WXX	Bolling Field ...	U.S.A.
WVO	Courtois ...	Ship	WXX	Langley Field	U.S.A.
WVO	Coushatta ...	Ship	WXX	Fairfield ...	U.S.A.
WVO			WXX	Selfridge Field	U.S.A.
WVO			WXX	Scott Field ...	U.S.A.
WVO			WXX	Kelly Field ...	U.S.A.
WVO			WXX	Rockwell Field	U.S.A.
WVO			WXX	General Royal	Ship
WVO			WXX	T. Frank ...	Ship

WYAB	General S. M. Mills ...	Ship	WYBM	Captain Samuel C. Cardwell	Ship
WYAC	Major Samuel Ringold ...	Ship	WYBN	Captain Fred L. Perry ...	Ship
WYAD	General Henry J. Hunt ...	Ship	WYBO	Captain Edwin C. Long ...	Ship
WYAE	General Henry Knox ...	Ship	WYBP	Captain Edward P. Nones ...	Ship
WYAF	General E. O. C. Ord ...	Ship	WYBQ	Lieut. Harold G. Douglas ...	Ship
WYAG	Colonel George Armistead ...	Ship	WYBR	Lt.-Col. Robert C. Gildart ...	Ship
WYAH	General Robert Anderson ...	Ship	WYBS	Lt.-Col. Herman C. Schumm ...	Ship
WYAI	Captain Charles W. Rowell ...	Ship	WYBT	Major Carl A. Lohr ...	Ship
WYAJ	General A. M. Randal ...	Ship	WYBU	Major Lester E. Morton ...	Ship
WYAK	General Harvey Brown ...	Ship	WYBV	Major Albert G. Jenkins ...	Ship
WYAL	General R. B. Ayres ...	Ship	WYBW	Major William P. Pence ...	Ship
WYAM	Captain James Fornance ...	Ship	WYBX	Major John W. McKie ...	Ship
WYAN	Reno WYAN ...	Ship	WYBY	Captain Clarence M. Condon ...	Ship
WYAO	Major Evans Thomas ...	Ship	WYCA	Cuba WYCA ...	Ship
WYAP	Captain Gregory Barrett ...	Ship	WYDA	S. Louis ...	U.S.A.
WYAQ	Major Albert G. Forse ...	Ship	WYDB	Memphis ...	U.S.A.
WYAR	Lieut. Geo. M. Harris ...	Ship	WYDC	New Orleans ...	U.S.A.
WYAS	General G. W. Getty ...	Ship	WYDD	Natchez WYDD ...	Ship
WYAT	Captain A. M. Wetherill ...	Ship	WYDE	Vicksburg ...	Ship
WYAU	General Robert W. Shartout ...	Ship	WYDF	Cairo WYDF ...	Ship
WYAV	General S. B. Holabird ...	Ship	WYDG	S.S. Louis ...	Ship
WYAW	General R. H. Jackson ...	Ship	WYDH	New Orleans WYDH ...	Ship
WYAY	General Richard Arnold ...	Ship	WYDI	Baton Rouge WYDI ...	Ship
WYAZ	Captain T. M. Morrison ...	Ship	WYDJ	Memphis ...	Ship
WYBA	General Absalom Baird ...	Ship	WZA	Fort Screven ...	U.S.A.
WYBB	General J. Franklin Bell ...	Ship	WZC	Fort Whitman ...	U.S.A.
WYBC	Cyrus W. Field ...	Ship	WZD	Fort Barrancas ...	U.S.A.
WYBD	General William M. Graham ...	Ship	WZE	Fort Constitution ...	U.S.A.
WYBE	Colonel George F. E. Harrison ...	Ship	WZF	Fort Moultrie ...	U.S.A.
WYBF	General Edmund Kirby ...	Ship	WZH	Fort Eads ...	U.S.A.
WYBG	General Wallace F. Randolph ...	Ship	WZJ	Fort Casey ...	U.S.A.
WYBH	General John B. Story ...	Ship	WZK	Fort Dade ...	U.S.A.
WYBI	Colonel Albert Todd ...	Ship	WZN	Fort Du Pont ...	U.S.A.
WYBJ	Colonel Garland N. Whistler ...	Ship	WZO	Fort Bliss ...	U.S.A.
WYBK	Colonel John V. White ...	Ship	WZP	Fort Huachuca ...	U.S.A.
WYBL	Poe ...	Ship	WZQ	General Timethy Pickering ...	Ship
			WZR	General Nathaniel Greene ...	Ship
			WZS	Henry Wilson ...	Ship
			WZT	General George H. Weeks ...	Ship
			WZU	Sprigg Carroll ...	Ship
			WZV	General J. M. Brannon ...	Ship
			WZW	General R. N. Batchelder ...	Ship
			WZY	Major Guy Howard ...	Ship
			WZY	General Miffen ...	Ship
			WZZ	S. Pedro ...	Ship
			WZAA	L. J. Drake ...	Ship
			WZAE	West Humhaw ...	Ship
			WZAU	E. C. Pope ...	Ship

WZEA	Saxon WZEA	Ship	XY	San Antonio ...	U.S.A.
WZEE	Maruba ...	Ship	XZ	Grand Coteau	U.S.A.
WZEU	North Pines ...	Ship	XZ	Washington ...	U.S.A.
WZIO	Admiral Mayo	Ship	XAA	Houston ...	U.S.A.
WZIU	Western Plains	Ship	XAA	Vera Cruz ...	Mexico
WZOA	Lake Graphite	Ship	XAB	Little Rock ...	U.S.A.
WZOE	Lake Gratis ...	Ship	XAB	Kansas City ...	U.S.A.
WZOI	Lake Gratton ...	Ship	XAB	Campeche ...	Mexico
WZOO	Lake Gravella...	Ship	XAC	Conway ...	U.S.A.
WZOU	Lake Gravett ...	Ship	XAC	Davenport ...	U.S.A.
WZUA	Norfolk WZUA	Ship	XAC	Payo Pbispo ...	Mexico
WZUE	Newburgh ...	Ship	XAD	Buffalo ...	U.S.A.
XA	Olinda ...	Ship	XAD	Maria Madre	Mexico
XA	Ann Arbor ...	U.S.A.	XAD	Orange...	U.S.A.
XA	Atlanta ...	U.S.A.	XAD	Alamos de	
XB	Philadelphia ...	U.S.A.		Sonora ...	Mexico
XB	Savannah ...	U.S.A.	XAE	Mobile ...	Alaska
XB	Chicago ...	U.S.A.	XAE	Bridgeport ...	U.S.A.
XB	Paloma ...	Ship	XAE	Mazatlan de	
XC	Philadelphia ...	U.S.A.		Sinoloa ...	Mexico
XC	Ellsworth ...	U.S.A.	XAF	Oklahoma ...	U.S.A.
XC	Colorado Springs	U.S.A.	XAF	Highland Park	U.S.A.
XD	Dearborn ...	U.S.A.	XAF	Boston ...	U.S.A.
XD	Washington ...	U.S.A.	XAF	Washington ...	U.S.A.
XF	Brownwood ...	U.S.A.	XAF	Paz de la Baja	
XG	Chicago ...	U.S.A.		(La) ...	Mexico
XG	Washington ...	U.S.A.	XAF	San Jose Del	
XG	Bangor ...	U.S.A.		Cabo...	Mexico
XG	Tampa ...	U.S.A.	XAG	Santo Rosalia	Mexico
XH	Fort Wayne ...	U.S.A.	XAG	Birmingham ...	Alaska
XH	Stanford Univer-		XAG	Philadelphia ...	U.S.A.
	sity ...	U.S.A.	XAG	Hamilton ...	U.S.A.
XI	Minneapolis ...	U.S.A.	XAG	Boston ...	U.S.A.
XI	Portland ...	U.S.A.	XAH	Reading ...	U.S.A.
XI	Atlanta ...	U.S.A.	XAH	Cinnatti ...	Mexico
XI	Pasadena ...	U.S.A.	XAH	Guaymas ...	Mexico
XJ	Tampa ...	U.S.A.	XAI	Newark ...	U.S.A.
XJ	Colombus ...	U.S.A.	XAI	State College ...	U.S.A.
XJ	Urbana ...	U.S.A.	XAI	Tuxpan de Vera	
XK	Newton ...	U.S.A.		Cruz ...	Mexico
XK	Philadelphia ...	U.S.A.	XAJ	Tampico de	
XL	Northville ...	U.S.A.		Tamaulipas	Mexico
XL	Portland ...	U.S.A.	XAJ	Cincinnati ...	Mexico
XL	Madison ...	U.S.A.	XAK	Newark ...	U.S.A.
XM	New York ...	U.S.A.	XAK	Springfield ...	U.S.A.
XM	New Orleans ...	U.S.A.	XAK	Acapulco de	
XM	Madison ...	U.S.A.		Guerrero ...	Mexico
XM	Lansing ...	U.S.A.	XAL	New York ...	U.S.A.
XN	Houston ...	U.S.A.	XAL	Port Lobos ...	Mexico
XO	Knoxville ...	U.S.A.	XAL	San Nicolas ...	Mexico
XO	Detroit ...	U.S.A.	XAM	New Brunswick	U.S.A.
XP	Delancho ...	U.S.A.	XAM	Merida de	
XP	Athol ...	U.S.A.		Yucatan ...	Mexico
XQ	Schenectady ...	U.S.A.	XAN	Great Neck ...	Mexico
XQ	Winthrop ...	U.S.A.	XAN	Salina Cruz ...	Mexico
XS	Worcester ...	U.S.A.	XAN	Chicago ...	Mexico
XT	Cleveland ...	U.S.A.	XAO	Los Angeles ...	U.S.A.
XT	Waterbury ...	U.S.A.	XAO	Belmar... ..	U.S.A.
XU	Fresno ...	U.S.A.	XAP	Troy ...	U.S.A.
XV	Philadelphia ...	U.S.A.	XAQ	Boulder ...	U.S.A.
XV	Port Aurthur ...	U.S.A.	XAR	Oakland ...	U.S.A.
XW	Parkesburg ...	U.S.A.	XAS	South Pasadena	U.S.A.
XW	Pittsburg ...	U.S.A.	XAU	San Francisco	U.S.A.
XW	Galesburg ...	U.S.A.	XAV	Oklahoma City	U.S.A.
XX	Pittsburg ...	U.S.A.	XBA	San Bernardo	Ship
XX	San Francisco	U.S.A.	XBB	Mexico ...	Ship
XX	Austin ...	U.S.A.	XBE	San Antonio ...	Ship
XY	New York ...	U.S.A.	XBF	Korrigan III ...	Ship
XY	Pittsburg ...	U.S.A.	XBH	Mazatlan ...	Ship

XCA	General Zaragoza	Ship	XIM	Verbania	1	Ship
XCF	Progreso	Ship	XIN	Bonny	...	Ship
XEA	Well Park	Ship	XIO	Glenshane	...	Ship
XEB	Glenpark	Ship	XIR	Varzin	...	Ship
XEF	Gulf of Suez	Ship	XIT	Menapian	...	Ship
XEJ	Kinsale	Ship	XIU	Gothic Prince	...	Ship
XEK	Eric Calvert	Ship	XIV	Slavic Prince	...	Ship
XEL	Auldmuir	Ship	XIW	Gaelic Prince	...	Ship
XEM	Treglisson	Ship	XIX	Celtic Prince	...	Ship
XEN	Victorian	Ship	XIY	Arabian Prince	...	Ship
XEO	Transport	Ship	XIZ	Persian Prince	...	Ship
XEP	Melrose Abbey	Ship	XJA	River Dart	...	Ship
XEP	City of Rheims	Ship	XJB	Hatimura	...	Ship
XEQ	Glen	Ship	XJC	Melmore Head	...	Ship
XEQ	Gerent	Ship	XJE	Clan Alpine	...	Ship
XES	Baron Ailsa	Ship	XJF	Cahiracon	...	Ship
XET	William	Ship	XJG	Kenilworth	...	Ship
XEU	Middleton	Ship	XJH	Henry Holmes	...	Ship
XEW	Confield	Ship	XJI	Rion	...	Ship
XEX	Sedge Pool	Ship	XJJ	Kura	...	Ship
XEX	City of Corinth	Ship	XJK	Cairnvalona	...	Ship
XEY	Kioto	Ship	XJM	Nilemede	...	Ship
XEZ	Menevian	Ship	XJN	Islandia	...	Ship
XFA	Hocking	Ship	XJO	Maimyo	...	Ship
XFB	Madame	Ship	XJP	Malancha	...	Ship
XFC	Enterprise	Ship	XJO	Macharda	...	Ship
XFD	Mahsud	Ship	XJU	Australier	XJU	Ship
XFD	Otra	Ship	XJW	Kaikorai	...	Ship
XFE	Bernini	Ship	XKB	Tregonell	...	Ship
XFF	Ravens Point	Ship	XKC	Treneglos	...	Ship
XFG	Duke of Cornwall	Ship	XKD	Trevose	...	Ship
XFG	XFG	Ship	XKG	Lesto	...	Ship
XFH	Penmount	Ship	XKK	Peveril	...	Ship
XFJ	Rounton	Ship	XKL	Mogileff	...	Ship
XFK	Addington	Ship	XKO	Ranee	...	Ship
XFM	Burdale	Ship	XKP	Rajah XKP	...	Ship
XFO	Horseferry	Ship	XKQ	Woodville	...	Ship
XFP	Glint	Ship	XKV	Clan Macmillan	...	Ship
XFO	Keynes	Ship	XKW	Valemore	...	Ship
XFR	Whitwood	Ship	XKX	Westhope	...	Ship
XFU	Lady Wimborne	Ship	XKY	Montezuma	...	Ship
XFW	Glitra	Ship	XLC	Horn Shell	...	Ship
XFZ	Notanda	Ship	XLD	Oakwin	...	Ship
XGE	Zaida	Ship	XLG	Bradavon	...	Ship
XHB	Clan Macvicar	Ship	XLH	Argalia	...	Ship
XHC	Eskasoni XHC	Ship	XLK	Trevean	...	Ship
XHH	Jacov Sverdlov	Ship	XLM	Mount Everest	...	Ship
XHK	Boverton	Ship	XLN	Baron Blantyre	...	Ship
XHL	Grelrosa	Ship	XLP	Warina	...	Ship
XHM	Uprinster	Ship	XLS	Trojan Prince	...	Ship
XHN	Relentless XHN	Ship	XLZ	Relillio	...	Ship
XHO	Port Nicholson	Ship	XMA	Woodburn	...	Ship
XHP	Port Bowen	Ship	XMB	Lorina	...	Ship
XHQ	Port Caroline	Ship	XMC	Redruth	...	Ship
XHU	Sheridan XHU	Ship	XMG	Verentia	...	Ship
XHV	Kamir	Ship	XMK	Conus	...	Ship
XHX	Ryburn	Ship	XML	War Nawab	...	Ship
XHY	Rexmore	Ship	XMM	War Diwan	...	Ship
XHZ	Sweetthope	Ship	XMN	Cardita	...	Ship
XIA	Volcella	Ship	XMT	Sheaf Lance	...	Ship
XID	Norburn	Ship	XMU	Rajput	...	Ship
XIE	Polycarp	Ship	XMV	Roquette	...	Ship
XIG	Uskside	Ship	XMY	Silverash	...	Ship
XIH	Petworth	Ship	XNB	Tung-An	...	Ship
XII	Serbino	Ship	XNC	Yung Tsih	...	Ship
XIJ	Gileston	Ship	XNF	Yung Fung	...	Ship
XIK	Deerwood	Ship	XNG	Yung-Chion	...	Ship
XIL	Sydney Reid	Ship	XNL	Foo-An	...	Ship
XIL	Muneric	Ship	XNO	Yu-Chang	...	Ship

XNP	Canton ...	China	XWD	Canadian	
XNS	Nan-Shen ...	Ship		Adventurer	Ship
XNW	Chao-Ho ...	Ship	XWG	Canadian Aviator	Ship
XNY	Yung-Kien ...	Ship	XWH	Canadian Sower	Ship
XOA	Chu-Tai ...	Ship	XWI	Canadian Settler	Ship
XOC	Wuchang ...	China	XWJ	Canadian	
XOD	Chu-Tung ...	Ship		Navigator ...	Ship
XOG	Chu-Kwan ...	Ship	XWK	Canadian Sealer	Ship
XON	Chu-Chien ...	Ship	XWL	E. D. Kingsley	Ship
XOU	Chu-Yu ...	Ship	XWM	Canadian Skinner	Ship
XOW	Foochow ...	China	XWN	Canadian Raider	Ship
XOY	Chu-Yew ...	Ship	XWO	Canadian Rancher	Ship
XPF	Tung-Chi ...	Ship	XWP	Canadian	
XPK	Peking ...	China		Planter ...	Ship
XPN	Kien-An ...	Ship	XWQ	Canadian	
XPO	Kien-Kong ...	Ship		Importer ...	Ship
XPS	Fei-Ying ...	Ship	XWS	Canadienne (La)	Ship
XPW	Kien-Wei ...	Ship	XWT	Canadian	
XQC	Kiang-Chien ...	Ship		Inventor ...	Ship
XQH	Kiang-Han ...	Ship	XWU	Canadian	
XQL	Kalgan ...	China		Prospector ...	Ship
XQR	Kiang-Li ...	Ship	XWV	Canadian Miner	Ship
XQU	Kiang-Yuen ...	Ship	XWW	Valcartier ...	Ship
XQW	King Ching ...	Ship	XWX	Canadian Farmer	Ship
XRC	Lien-Chin ...	Ship	XWY	Canadian Beaver	Ship
XSC	Hai-Chi ...	Ship	XWZ	Cote Nord ...	Ship
XSF	Ying Swei ...	Ship	XXB	Umlazi ...	Ship
XSG	Woosung ...	China	XXD	Warla ...	Ship
XSH	Shanghai ...	China	XXQ	War Nicola ...	Ship
XSI	Hwah Jah ...	Ship	XXT	Cormount ...	Ship
XSJ	Hwah Yih ...	Ship	XXY	Harold Casper	Ship
XSK	Hwah Ping ...	Ship	YA	Iowa City ...	U.S.A.
XSL	Hwah Ting ...	Ship	YC	Raleigh ...	U.S.A.
XSM	Hao-Ou ...	Ship	YE	Morgantown ...	U.S.A.
XSP	Hai-Shen ...	Ship	YI	Poletecnic ...	U.S.A.
XST	Hai-Tien ...	Ship	YJ	Corvallis ...	U.S.A.
XSU	Tsungming ...	China	YO	Tacoma ...	U.S.A.
XSW	Hai-Chew ...	Ship	YO	Columbus ...	U.S.A.
XSY	Hai-Yung ...	Ship	YP	Butte ...	U.S.A.
XTK	Bahadur ...	Ship	YR	New Orleans ...	U.S.A.
XUC	Krasnoiarisk ...	Ship	YS	Port Worth ...	U.S.A.
XUJ	Tremeadow ...	Ship	YS	Washington ...	U.S.A.
XUK	Pinna ...	Ship	YT	San Marcos ...	U.S.A.
XUO	Tresillian ...	Ship	YX	Minneapolis ...	U.S.A.
XUP	Dredgol ...	Ship	YZ	Milwaukee ...	U.S.A.
XVA	Canadian Warrior	Ship	YAA	Argonauta ...	Ship
XVB	Glenorchy ...	Ship	YAC	Bogata YAC ...	Ship
XVD	Lucknow ...	Ship	YAD	Dromore Castle	Ship
XVE	Quebec XVE ...	Ship	YAE	Beechwood ...	Ship
XVF	Canadian Ranger	Ship	YAF	Settler ...	Ship
XVI	Westmount XVI	Ship	YAG	Anglier ...	Ship
XVK	Canadian Recruit	Ship	YAL	Denver ...	U.S.A.
XVL	Mariska ...	Ship	YAM	Laristan ...	Ship
XVM	Canadian		YAN	Bratton Castle	Ship
	Volunteer ...	Ship	YAN	Peoria ...	U.S.A.
XVN	Canadian Trooper	Ship	YAO	Des Moines ...	U.S.A.
XVP	Canadian Trader	Ship	YAP	Mina Brea ...	Ship
XVO	Algerine ...	Ship	YAP	Davenport ...	U.S.A.
XVR	Canadian Sailor	Ship	YAO	Dunaff Head ...	Ship
XVS	Canadian		YAR	Harlow ...	Ship
	Seigneur ...	Ship	YAU	Homefield ...	Ship
XVU	Canadian		YAV	Swiftway ...	Ship
	Signaller ...	Ship	YAX	Dundrum Castle	Ship
XVV	Sable I ...	Ship	YBA	Gilwen Park ...	Ship
XVX	Turret Crown	Ship	YBB	Kaiping ...	Ship
XVY	Vaudreuil ...	Ship	YBC	Nizam ...	Ship
XVZ	Canadian Miller	Ship	YBF	Bampton Castle	Ship
XWA	Algerine No. 2	Ship	YBG	Astrakhan ...	Ship
XWB	Iver Heath ...	Ship	YBH	Otterburn ...	Ship

YBM	Warawala ...	Ship	YFV	Lord Rhondda	Ship
YBO	Normandier ...	Ship	YFY	Algorta ...	Ship
YBS	Nelcion ...	Ship	YFZ	Byeway ...	Ship
YBT	Kamenetz ...	Ship	YGA	Mokta ...	Ship
	Podolsk ...	Ship	YGB	Boukadra ...	Ship
YCA	Benwood ...	Ship	YGC	Southway ...	Ship
YCB	Bisley ...	Ship	YGE	Roseden ...	Ship
YCC	Fantee ...	Ship	YGF	Halesius ...	Ship
YCD	Hemisphere ...	Ship	YGG	Trevaylor ...	Ship
YCE	Northborough ...	Ship	YGH	Alpine Range ...	Ship
YCF	Biafra ...	Ship	YGI	Clearton ...	Ship
YCI	Trevanion ...	Ship	YGK	Tees Pool ...	Ship
YCJ	Monkshaven ...	Ship	YGL	Port Darwin ...	Ship
YCK	Loyal Citizen ...	Ship	YGM	Port Denison ...	Ship
YCO	Bodnant ...	Ship	YGP	Paul Paix ...	Ship
YCP	Willaston ...	Ship	YGO	Whimbrel ...	Ship
YCO	Bakana ...	Ship	YGR	Irish Monarch ...	Ship
YCR	Lady Kathleen ...	Ship	YGS	Magdala YGS ...	Ship
YCU	Levnet ...	Ship	YGU	Lady Kirk ...	Ship
YCV	Spectator ...	Ship	YGV	Peterton ...	Ship
YCX	Caithness ...	Ship	YGW	Tiberton ...	Ship
YCY	Phorus ...	Ship	YGX	Glofield ...	Ship
Y CZ	Boutry ...	Ship	YGY	Ravelston ...	Ship
YDB	Carlow Castle ...	Ship	YGZ	Eastern City ...	Ship
YDC	Bereby ...	Ship	YHA	Haleric ...	Ship
YDD	Earlswood ...	Ship	YHB	Pendarves ...	Ship
YDE	Anghoria ...	Ship	YHC	Helredale ...	Ship
YDF	Glensloy ...	Ship	YHF	Frankier ...	Ship
YDH	Rheinfels ...	Ship	YHG	Morinier ...	Ship
YDI	Rossia ...	Ship	YHH	Luceric ...	Ship
YDJ	Holly-park ...	Ship	YHL	Adra ...	Ship
YDL	Dront ...	Ship	YHN	Alaveño ...	Ship
YDM	Chertsey ...	Ship	YHO	Electrician ...	Ship
YDO	Westra ...	Ship	YHQ	Red Bridge ...	Ship
YDP	Crane YDP ...	Ship	YHR	Cornish City ...	Ship
YDR	Maindy Grange ...	Ship	YHS	Lancashire ...	Ship
YDT	Kingsbury ...	Ship	YHT	Clintonia ...	Ship
YDW	Lingfield ...	Ship	YHW	Rhio ...	Ship
YDY	Lord Downshire ...	Ship	YHY	Slav ...	Ship
YDZ	Bellfield ...	Ship	YHZ	Clam ...	Ship
YEA	Sunix ...	Ship	YIB	Venetian ...	Ship
YEB	Batanga ...	Ship	YID	Middlemoor ...	Ship
YEC	Babagry ...	Ship	YIE	Glenmoor ...	Ship
YED	Holywell ...	Ship	YIF	Dalemead ...	Ship
YEF	Barracoo ...	Ship	YIH	River Taft ...	Ship
YEG	Helmsdale ...	Ship	YIK	Lowmead ...	Ship
YEH	Marie Rose YEH ...	Ship	YIM	Pearlmead ...	Ship
YEK	Baron Minto ...	Ship	YIR	Hallmoor ...	Ship
YEL	S. Dunstan ...	Ship	YIS	Trelawny ...	Ship
YEM	Bendoran ...	Ship	YIU	Ethelstan ...	Ship
YEN	S. Paul ...	Ship	YIV	Salacia ...	Ship
YEP	Glenmorac ...	Ship	YIW	Trevilly ...	Ship
YEQ	Scatwell ...	Ship	YIX	Finchley ...	Ship
YER	Gladiator YER ...	Ship	YIZ	S. Michael ...	Ship
YES	Clan Kenneth ...	Ship	YJB	Black Prince ...	Ship
YEW	Breconian ...	Ship	YJC	Abaris ...	Ship
YEX	Zimorodok ...	Ship	YJD	Chinese Prince ...	Ship
YFC	Lumina ...	Ship	YJG	Tuscan Prince ...	Ship
YFD	Imber ...	Ship	YJH	Southern Isles ...	Ship
YFG	Ariano ...	Ship	YJI	Royal Prince ...	Ship
YFH	Cabotia ...	Ship	YJJ	British Marshall ...	Ship
YFI	Hopelyn ...	Ship	YJK	Tudor Prince ...	Ship
YFL	Mottisfont ...	Ship	YJL	Maindy Dene ...	Ship
YFM	Penare ...	Ship	YJM	Bosworth ...	Ship
YFN	Innerton ...	Ship	YJN	Author ...	Ship
YFP	Sheaf Mead ...	Ship	YJO	Clan MacLaren ...	Ship
YFR	Deemster ...	Ship	YJQ	Clan Macaulay ...	Ship
YFS	Grelarlie ...	Ship	YJS	Benlawers ...	Ship
YFT	Elder Branch ...	Ship	YJT	Alberta YJT ...	Ship

YJU	Vera ...	Ship	YOT	Phidias ...	Ship
YJX	Bithina ...	Ship	YOV	Ningchow ...	Ship
YKA	Curaca ...	Ship	YOW	Deucalion YOW	Ship
YKE	Enfield ...	Ship	YOX	Teesbridge ...	Ship
YKG	Eskbridge ...	Ship	YOY	Pyrrhus ...	Ship
YKI	Hounslow ...	Ship	YOZ	Lycaon ...	Ship
YKJ	S. Monance ...	Ship	YPE	Oyleric ...	Ship
YKK	Stork YKK ...	Ship	YPF	Poplar Branch	Ship
YKL	Ilford ...	Ship	YPG	Novian... ..	Ship
YKO	Fionashell ...	Ship	YPH	Lime Branch ...	Ship
YKP	City of Amiens	Ship	YPJ	Hambleton Range	Ship
YKQ	Putney... ..	Ship	YPK	Crenella ...	Ship
YKT	S. Patrick YKT	Ship	YPL	Justin ...	Ship
YKV	Karnak ...	Ship	YPM	Boulac ...	Ship
YKW	Penrhos ...	Ship	YPN	Grainton ...	Ship
YKX	Bem Bridge ...	Ship	YPO	Peleus ...	Ship
YKZ	Sikh YKZ ...	Ship	YPP	Teen kai ...	Ship
YLB	Ortinasshell ...	Ship	YPR	Cuthbert ...	Ship
YLC	Lady Charlotte	Ship	YPS	Clan MacBrayne	Ship
YLD	Darnholme ...	Ship	YPT	Valdura ...	Ship
YLE	Watsness ...	Ship	YPW	Port Rushton	Ship
YLF	Kut ...	Ship	YPX	Hellopes ...	Ship
YLK	Khartum ...	Ship	YPZ	Hindoo ...	Ship
YLM	Yarborough	Ship	YQA	Bassano YQA	Ship
	YLM ...	Ship	YQC	Archimedes ...	Ship
YLN	Livingstonia ...	Ship	YQH	Portsea ...	Ship
YLT	Benarty ...	Ship	YQJ	Competitor ...	Ship
YLU	Benledi ...	Ship	YQJ	Briton ...	Ship
YLV	Pike Pool ...	Ship	YQK	Maresfield ...	Ship
YLW	Highway ...	Ship	YQL	Norman Monarch	Ship
YLX	Pengelly ...	Ship	YQR	British Soldier	Ship
YLY	Flaminian ...	Ship	YQU	Eury Pamas ...	Ship
YLZ	Methven ...	Ship	YQV	Maindy Hill ...	Ship
YMA	Cliff Tower ...	Ship	YQW	Marinula ...	Ship
YMC	Linkmoor ...	Ship	YQX	Admiral Cochrane	Ship
YMD	Kelsomoor ...	Ship	YQZ	Eurymachus ...	Ship
YME	Sapelle ...	Ship	YRA	Southern Queen	Ship
YMG	Palma YMG ...	Ship	YRB	Bradclyde ...	Ship
YMI	Warri ...	Ship	YRC	Lord Kelvin ...	Ship
YMJ	Boulama ...	Ship	YRD	Amarna ...	Ship
YMK	Sokoto ...	Ship	YRE	Tarantia ...	Ship
YMM	Egwanga ...	Ship	YRG	Euryades ...	Ship
YMP	Cedar Branch	Ship	YRH	Eurybates ...	Ship
YMQ	Marylebone ...	Ship	YRI	Eurylocus ...	Ship
YMT	Amasis ...	Ship	YRJ	Eurypylus ...	Ship
YMX	Riverdale ...	Ship	YRN	Grecian Prince	Ship
YMY	Pensilva ...	Ship	YRO	Hunts Green ...	Ship
YNA	Woodfield ...	Ship	YRS	Korean Prince	Ship
YNB	Orator ...	Ship	YRT	Sailor Prince ...	Ship
YNC	Biela ...	Ship	YRW	King Edward ...	Ship
YND	Airway... ..	Ship	YRX	Trevince ...	Ship
YNE	Mortlake ...	Ship	YRZ	Huntsend ...	Ship
YNF	Camillo ...	Ship	YSC	Milton Star ...	Ship
YNG	Mount Etna ...	Ship	YSD	Nitonian ...	Ship
YNL	Wabana ...	Ship	YSE	Melville YSE ...	Ship
YNO	City of Versailles	Ship	YSG	Ramore Head ...	Ship
YNT	Othello YNT ...	Ship	YSI	Jamaica ...	Ship
YNX	Limax ...	Ship	YSK	Camito ...	Ship
YNY	Boveric ...	Ship	YSL	Alconda ...	Ship
YOA	Mentor ...	Ship	YSM	City of Canton	Ship
YOG	Clan MacKinnon	Ship	YSN	Australia ...	Ship
YOH	Clan Cumming	Ship	YSP	Cranley ...	Ship
YOL	Mackinaw ...	Ship	YST	Karapara ...	Ship
YOM	Mahopac YOM	Ship	YSY	Colonial ...	Ship
YON	Clan Lamont ...	Ship	YSZ	Polyphemus ...	Ship
YOO	Clan Lindsay ...	Ship	YTA	Prometheus	Ship
YOP	Wye Tempest	Ship		YTA... ..	Ship
YOR	Cavour ...	Ship	YTB	City of Oran ...	Ship
YOS	Strabo ...	Ship	YTC	Matador ...	Ship

YTD	Britannic ...	Ship	YXZ	Grelgrant ...	Ship
YTE	Defender ...	Ship	YYA	Singapore ...	Ship
YTH	Murillo ...	Ship	YYB	Manchester Corporation...	Ship
YTI	Clan Mackay ...	Ship	YYC	Anglo-Mexican	Ship
YTJ	Mandala ...	Ship	YYD	Myrshell ...	Ship
YTM	Mercuria ...	Ship	YYE	Lapland ...	Ship
YTN	Orestes YTN ...	Ship	YYF	Zeeland YFF	Ship
YTO	Priam ...	Ship	YYJ	Bassa ...	Ship
YTR	Servian Prince	Ship	YYK	Moorish Prince	Ship
YTS	Corloch ...	Ship	YYL	Kashgar ...	Ship
YTT	Mattawa ...	Ship	YYM	Vellavia ...	Ship
YUH	Eastern ...	Ship	YYN	Siamese Prince	Ship
YUK	City of Sparta	Ship	YYO	Largo ...	Ship
YUM	Anglo-Egyptian	Ship	YYP	Michaelston ...	Ship
YUO	Sithonia ...	Ship	YYQ	City of Florence	Ship
YUR	Kasenga ...	Ship	YYR	Ursus YZR ...	Ship
YUS	Waimarino ...	Ship	YYT	Orthia ...	Ship
YUX	Jebba ...	Ship	YYU	City of Newcastle	Ship
YUY	Hatkholia ...	Ship	YYV	City of Cairo ...	Ship
YUZ	Hatarana ...	Ship	YYW	Knowsley Hall	Ship
YVA	Bengloe ...	Ship	YYX	Erinier ...	Ship
YVB	El Lobo ...	Ship	YYZ	Cherry Branch	Ship
YVC	Burutu... ..	Ship	YZA	Clan Colquhoun	Ship
YVF	Huntress ...	Ship	YZB	Clan Sinclair ...	Ship
YVH	Egori ...	Ship	YZC	Highland Prince	Ship
YVI	Romera ...	Ship	YZG	Clan Urquhart	Ship
YVJ	Namsang ...	Ship	YZH	Alexandra YZH	Ship
YVK	Shadwell ...	Ship	YZJ	Warialda ...	Ship
YVL	Ellerdale ...	Ship	YZK	Almanzora ...	Ship
YVN	County of Carmarthen...	Ship	YZL	Weehawken ...	Ship
YVO	Cairndhu ...	Ship	YZM	Huronian ...	Ship
YVR	Gothic Star ...	Ship	YZN	Kashmir ...	Ship
YVS	Tuscan Star ...	Ship	YZO	Kalyan ...	Ship
YVT	Mercian ...	Ship	YZP	Aras ...	Ship
YVV	Clan Macbeth	Ship	YZQ	Metagama ...	Ship
YVY	Saxonstar ...	Ship	YZS	Berwickshire ...	Ship
YVZ	Clan Buchanan	Ship	YZT	Egremont Castle	Ship
YWB	Rosstrevor ...	Ship	YZV	Great Southern	Ship
YWC	Slieve Bawn ...	Ship	YZW	Great Western	Ship
YWE	Slieve Gallion ...	Ship	YZY	Waterford ...	Ship
YWF	Slievemore ...	Ship	ZG	Byron ...	U.S.A.
YWG	Snowdon ...	Ship	ZG	Tallulah Falls	U.S.A.
YWH	South Stack ...	Ship	ZJ	East Palestine	U.S.A.
YWI	Duke of Connaught ...	Ship	ZJ	Vancouver ...	U.S.A.
YWJ	Duke of Cumberland	Ship	ZL	Neenah ...	U.S.A.
YWK	Duke of Argyll	Ship	ZM	Buffalo ...	U.S.A.
YWL	Duke of Clarence	Ship	ZM	Bourget ...	France
YWM	Colleen Bawn	Ship	ZO	Columbus ...	U.S.A.
YWN	Mellifont ...	Ship	ZQ	Berkeley ...	U.S.A.
YWO	Mongolian Prince	Ship	ZS	Bakersfield ...	U.S.A.
WYP	Thorpe Grange	Ship	ZU	Poletecnic ...	U.S.A.
YWR	Berrima ...	Ship	ZV	Salt Lake City	U.S.A.
YWT	Kumara ...	Ship	ZY	Fort Worth ...	U.S.A.
YXC	Clan Mackinlay	Ship	ZAB	Welsh Prince ...	Ship
YXE	Llangollen ...	Ship	ZAB	Scranton ...	U.S.A.
YXF	Fanad Head ...	Ship	ZAD	Sunnyvale ...	U.S.A.
YXG	Monette YXG	Ship	ZAE	Royal Transport	Ship
YXJ	Egesford ...	Ship	ZAF	Columbus ...	U.S.A.
YXK	Balu Chistan ...	Ship	ZAG	Thespis ...	Ship
YXL	Sureway ...	Ship	ZAG	Grand Rapids	U.S.A.
YXM	Loyal Devonian	Ship	ZAH	Saint Paul ...	U.S.A.
YXR	Princess Maud	Ship	ZAH	Fort Worth ...	U.S.A.
YXS	Varpulia ...	Ship	ZAI	Telemachus ZAI	Ship
YXT	Penolver ...	Ship	ZAK	Mombassa ...	Ship
YXV	Scottish Prince	Ship	ZAN	Chepstow Castle	Ship
YXX	Clan Mackenzie	Ship	ZAP	Winnebago ZAP	Ship
			ZAQ	Dallas ...	U.S.A.
			ZAR	Rathlin Head	Ship

ZAR	El Paso ...	U.S.A.	ZFC	Cairnmona ...	Ship
ZAT	Corcrag ...	Ship	ZFD	Graciana ...	Ship
ZAU	Sarah Jolliffe ...	Ship	ZFG	Segura ...	Ship
ZAV	Anamba ...	Ship	ZFN	Yoserie ...	Ship
ZAX	Muncaster Castle ...	Ship	ZFP	Dolphin Shell ...	Ship
ZAX	Abilene ...	U.S.A.	ZFP	Baron Sempill ...	Ship
ZAY	Lexington ZAY ...	Ship	ZFU	Merchant Prince ...	Ship
ZAY	Dallas ...	U.S.A.	ZFW	Soldier Prince ...	Ship
ZZZ	Abadesa ...	Ship	ZGB	Rhodesian ...	Ship
ZZZ	Fayetteville ...	U.S.A.	ZGC	Transport ...	Ship
ZBA	Lepanto ZBA ...	Ship	ZGD	Kambole ...	Ship
ZBB	Camoens ...	Ship	ZGE	Heathfield ...	Ship
ZBC	Marconi ...	Ship	ZGI	Clan Macintosh ...	Ship
ZBE	Manchester Hero ...	Ship	ZGM	Roman Prince ...	Ship
ZBI	Wyncote ...	Ship	ZGO	Alexandrian ...	Ship
ZBJ	Devon ...	Ship	ZGP	Nubian ...	Ship
ZBL	Northumberland ...	Ship	ZGQ	Median ...	Ship
ZBM	Westmoreland ...	Ship	ZGR	Meltonian ...	Ship
ZBN	ZBM ...	Ship	ZGR	Trevisa ...	Ship
ZBS	Moliere ...	Ship	ZGS	Napierian ...	Ship
ZBT	Monarch ZBS ...	Ship	ZGU	Oranian ...	Ship
ZBT	Leitrim ...	Ship	ZGW	Scythian ...	Ship
ZBV	Salvador ZBV ...	Ship	ZGZ	Hazel Branch ...	Ship
ZBZ	Corfell ...	Ship	ZHE	Vasna ...	Ship
ZCB	Clan Macphee ...	Ship	ZHG	Acajutla ...	Ship
ZCE	Liberty ZCE ...	Ship	ZHH	Architect ...	Ship
ZCF	Classic ...	Ship	ZHJ	Tunisia ...	Ship
ZCG	Ebani ...	Ship	ZHK	Vennachar ...	Ship
ZCG	Belltown ...	Ship	ZHL	Catalina ZHL ...	Ship
ZCK	S. Denis ...	Ship	ZHM	Conway ...	Ship
ZCO	Nottingham ...	Ship	ZHO	Teviot ...	Ship
ZCP	Archangel ...	Ship	ZHP	King Bleddyn ...	Ship
ZCS	Camberley ZCS ...	Ship	ZHS	Clan Chattan ...	Ship
ZCX	Grelhead ...	Ship	ZHT	Clan Macbride ...	Ship
ZCZ	Southgate ...	Ship	ZHW	Dryden ZHW ...	Ship
ZDA	Haightown ...	Ship	ZHX	Elswick House ...	Ship
ZDE	Tregarhen ...	Ship	ZHY	Siddons ...	Ship
ZDM	Lord Antrim ...	Ship	ZHZ	Socrates ...	Ship
ZDO	Imani ...	Ship	ZIA	Lady Rhondda ...	Ship
ZDP	American ...	Ship	ZIB	Plutarch ...	Ship
ZDR	Transport ...	Ship	ZIC	Tamarac ...	Ship
ZDR	Indian Transport ...	Ship	ZIH	Sea Serpent ...	Ship
ZDS	Cape Transport ...	Ship	ZII	Rhesus ...	Ship
ZDT	British Transport ...	Ship	ZIK	Norman Prince ...	Ship
ZDU	Canadian ...	Ship	ZIL	Patani ...	Ship
ZDV	Transport ...	Ship	ZIN	Volga ...	Ship
ZDV	Panama Trans- port ...	Ship	ZIO	Buchanness ...	Ship
ZDW	Egyptian ...	Ship	ZIR	Sellasia ...	Ship
ZDX	Transport ...	Ship	ZIS	Cloutsham ...	Ship
ZDX	Vera Kathleen ...	Ship	ZIT	River Araxes ...	Ship
ZDY	Corcliff ...	Ship	ZIV	Maple Branch ...	Ship
ZDZ	Ocean Transport ...	Ship	ZJA	Seattle ZJA ...	Ship
ZEA	Queensland ...	Ship	ZJB	Ariosto ...	Ship
ZEC	Transport ...	Ship	ZJC	Domingo de ...	Ship
ZEC	Corcove ...	Ship	ZJD	Larrinaga ...	Ship
ZED	Pacific Transport ...	Ship	ZJD	Bournemouth ...	Ship
ZEE	Tasmanian ...	Ship	ZJF	Agapenor ...	Ship
ZEF	Transport ...	Ship	ZJG	Quantock ...	Ship
ZEF	Derwent River ...	Ship	ZJH	Sutton Hall ...	Ship
ZEG	Riverway ...	Ship	ZJH	Warcuta ...	Ship
ZEH	Gambia River ...	Ship	ZJK	Agamemnon ZJK ...	Ship
ZEK	Sagama River ...	Ship	ZJM	Tydeus ...	Ship
ZEM	Orange River ...	Ship	ZJN	Pak Ling ...	Ship
ZEN	Lyneton Grange ...	Ship	ZJO	Pinemoor ...	Ship
ZEQ	Oaklands Grange ...	Ship	ZJQ	Alginous ...	Ship
ZER	Rounton Grange ...	Ship	ZJS	Hector ZJS ...	Ship
ZET	Sunlando ...	Ship	ZJT	Helenus ...	Ship
ZEW	Havre ...	Ship	ZJX	Aylestone ...	Ship
			ZJZ	Teiresias ...	Ship

ZKA	Telamon ...	Ship	ZNN	Gordon Castle...	Ship
ZKC	Tyndareus ...	Ship	ZNO	Hindustan ...	Ship
ZKD	Elpenor ...	Ship	ZNP	Tritonia ...	Ship
ZKF	Astyanax ...	Ship	ZNR	Falls City ...	Ship
ZKG	Atreus ...	Ship	ZNR	Kebkebia ...	Spain
ZKH	Demodocus ...	Ship	ZNS	Niceto de	
ZKI	Hyson ...	Ship		Larrinaga ...	Ship
ZKK	Myrmidon ...	Ship	ZNU	Tanfield ...	Ship
ZKL	Neleus ...	Ship	ZNX	Karagola ...	Ship
ZKO	Yang Tsze ...	Ship	ZNZ	Port Napier ...	Ship
ZKP	Keemun ...	Ship	ZOA	Tambooy ...	Ship
ZKQ	Dominic ...	Ship	ZOB	Cromer ...	Ship
ZKR	Tuscany ...	Ship	ZOD	Regina ...	Ship
ZKS	Santanta ...	Ship	ZOE	Newby Hall ...	Ship
ZKS	Aberdonian ...	Ship	ZOF	Manchester	
ZKT	Carrigan Head ...	Ship		Shipper ...	Ship
ZKU	Mytilus ...	Ship	ZOG	Novgorod ...	Ship
ZKV	Valacia ...	Ship	ZOH	Largo Law ...	Ship
ZKW	Glengyle ...	Ship	ZOI	Albania ...	Ship
ZKY	Benedict ...	Ship	ZOK	Yarosavl ...	Ship
ZLA	Chancellor ...	Ship	ZOL	Sheaf Don ...	Ship
ZLB	Glennavy ...	Ship	ZOP	Romeo ...	Ship
ZLC	Ruysdael ...	Ship	ZOQ	Baron Renfrew ...	Ship
ZLE	Dunstan ...	Ship	ZOV	Quentin ...	Ship
ZLF	Capelhall ...	Ship	ZOW	Jervaulx Abbey ...	Ship
ZLH	Highland Star ...	Ship	ZOX	Indian Prince ...	Ship
ZLJ	Ekaterinoslav ...	Ship	ZPC	Nascopie ...	Ship
ZLK	British Emperor ...	Ship	ZPD	Port Lyttelton ...	Ship
ZLL	Intombi ...	Ship	ZPE	Cornish Point ...	Ship
ZLM	Veronej ...	Ship	ZPF	Aldworth ...	Ship
ZLO	Oliva ZLO ...	Ship	ZPG	Roumelian ...	Ship
ZLP	Glenamoy ...	Ship	ZPJ	Freinfells ...	Ship
ZLQ	Sultania ...	Ship	ZPL	Pennyworth ...	Ship
ZLR	Rollo ...	Ship	ZPN	Clan Stuart ...	Ship
ZLS	Gutcombe ...	Ship	ZPP	Baron Elcho ...	Ship
ZLT	Port Elliot ...	Ship	ZPQ	Warrior ...	Ship
ZLU	Port Sydney ...	Ship	ZPT	Grigua ...	Ship
ZLY	Tartar Prince ...	Ship	ZPU	Amatonga ...	Ship
ZLZ	Chama ...	Ship	ZPW	Longnewton ...	Ship
ZMA	Arabistan ...	Ship	ZQA	Baronesa ...	Ship
ZMB	Prahsu ...	Ship	ZQC	Duquessa ...	Ship
ZME	Bendu ...	Ship	ZQD	Marquessa ...	Ship
ZMF	Benue ...	Ship	ZQE	Princesa ...	Ship
ZMH	Sunheath ...	Ship	ZQG	Euclid ...	Ship
ZMI	Shonga ...	Ship	ZQH	Sallust ...	Ship
ZMJ	Sulima ...	Ship	ZQI	Virgil ...	Ship
ZMK	Gaboon ...	Ship	ZQJ	Duffield ...	Ship
ZMM	Onitsha ...	Ship	ZQK	Clan Malcolm ...	Ship
ZMP	Zaria ...	Ship	ZQL	Manchester	
ZMQ	Benguela ...	Ship		Merchant ...	Ship
ZMR	Benin ...	Ship	ZQN	Manchester Port ...	Ship
ZMS	Kaduna ...	Ship	ZQQ	Alesia ZQQ ...	Ship
ZMT	Kwarra ...	Ship	ZQR	Umvuma ...	Ship
ZMU	Salaga ...	Ship	ZQS	Banchory ...	Ship
ZMV	Eburna ...	Ship	ZQT	Nawab ...	Ship
ZMW	Cowrie ...	Ship	ZQV	Manchester	
ZNA	Turbo ...	Ship		Civilian ...	Ship
ZNB	Barima ...	Ship	ZQW	Manchester	
ZNC	Manchester			Exchange ...	Ship
	Spinner ...	Ship	ZQX	Trotsky ...	Ship
ZND	Maplemore ...	Ship	ZQY	Manchester	
ZNF	Gambada ...	Ship		Importer ...	Ship
ZNG	Vedic ...	Ship	ZQZ	Manchester	
ZNH	Manchester			Mariner ...	Ship
	Producer ...	Ship	ZRA	Larne ...	Ship
ZNI	Raranga ...	Ship	ZRB	Kingsmere ...	Ship
ZNJ	Hartside ...	Ship	ZRC	Dotterel ...	Ship
ZNL	Donax ...	Ship	ZRF	Eden Hall ...	Ship
ZNM	Tintoretto ...	Ship	ZRH	Clemenceau ...	Ship

ZRI	Baron Cathcart	Ship	ZWC	Seapool ...	Ship
ZRJ	Roath ...	Ship	ZWD	Comedian ...	Ship
ZRK	Strathfillan ...	Ship	ZWF	Quito ZWF ...	Ship
ZRN	Reindeer ZRN	Ship	ZWG	Frances Duncan	Ship
ZRP	Cepolis ...	Ship	ZWH	Madras City ...	Ship
ZRR	Scottier ...	Ship	ZWJ	J. Duncan ...	Ship
ZRS	Anglo-Chilean	Ship	ZWL	Fishpool ...	Ship
ZRU	Goldenway ...	Ship	ZWN	Eastwood ...	Ship
ZRV	Katie ...	Ship	ZWP	Lucellum ...	Ship
ZRW	Queen Margaret	Ship	ZWS	Purpura ...	Ship
ZRX	Lowther Castle	Ship	ZWU	Penrose ...	Ship
ZRZ	Royalstar ...	Ship	ZWV	Yonne ...	Ship
ZSA	Clan Murdock	Ship	ZWX	Trident ZWX	Ship
ZSH	Chatham ZSH	Ship	ZWY	Waddon ...	Ship
ZSI	Ethelaida ...	Ship	ZWZ	Poland ...	Ship
ZSJ	Llanberis ...	Ship	ZXA	Zingara ...	Ship
ZSK	North Pacific ...	Ship	ZXB	Helmsloch ...	Ship
ZSL	Eider ZSL ...	Ship	ZXC	Belgie ...	Ship
ZSN	Pentakota ...	Ship	ZXG	Student ...	Ship
ZSU	Port Stephens...	Ship	ZXH	Helseysid ...	Ship
ZSV	Port Pirie ...	Ship	ZXI	Farnworth ...	Ship
ZSW	Port Melbourne	Ship	ZXJ	Parthenia ...	Ship
ZSZ	Laomedon ...	Ship	ZXK	Clan Macmaster	Ship
ZTB	Theseus ...	Ship	ZXL	Batsford ...	Ship
ZTC	Media ...	Ship	ZXM	Doon Holm ...	Ship
ZTD	Inverawe ...	Ship	ZXN	Penmorvah ...	Ship
ZTE	Eboe ...	Ship	ZXO	Gealicstar ...	Ship
ZTF	Princess Victoria	Ship	ZXP	Ionictsar ...	Ship
	ZTF ...	Ship	ZXQ	Celticstar ...	Ship
ZTH	Abbassieh ...	Ship	ZXR	Normanstar ...	Ship
ZTI	Siberian Prince	Ship	ZXS	Fotinia... ..	Ship
ZTJ	Royal Scot ...	Ship	ZXU	Hollinside ...	Ship
ZTL	Redgate ...	Ship	ZXV	Molesey ...	Ship
ZTR	S. Pablo ...	Ship	ZYA	Hannah ...	Ship
ZTT	Navarino ...	Ship	ZYC	Everilda ...	Ship
ZTU	Bavarian ...	Ship	ZYD	Kassala ...	Ship
ZTW	Trerefus ...	Ship	ZYF	Parktown ...	Ship
ZTY	Cape Ortegael	Ship	ZYG	Sea Glory ...	Ship
ZTZ	Carlo Victoria	Ship	ZYK	Petroleine ...	Ship
ZUE	Alert ZUE ...	Ship	ZYM	Greystoke Castle	Ship
ZUF	Trehawke ...	Ship	ZYO	Newlands ...	Ship
ZUG	Tapton... ..	Ship	ZYP	Somersby ...	Ship
ZUH	Trevehoe ...	Ship	ZYQ	Swainby ...	Ship
ZUI	Trecarne ...	Ship	ZYT	British	
ZUK	Shannonmede	Ship		Princess ...	Ship
ZUL	Athenic ZUL ...	Ship	ZYU	British	
ZUN	Orient City ...	Ship		Sovereign ...	Ship
ZUR	Foyle ZUR ...	Ship	ZYV	British Ensign	Ship
ZUT	Ikala ...	Ship	ZYW	British Isles ...	Ship
ZUW	Grecaldly ...	Ship	ZYY	British Admiral	Ship
ZUY	Boyne ZUY ...	Ship	ZYZ	British	
ZUZ	Cardiff Hall ...	Ship		Empress ...	Ship
ZVB	Lord Sefton ...	Ship	ZZA	Tangistan ...	Ship
ZVC	African		ZZB	General Allenby	Ship
	Prince ...	Ship	ZZD	Newton Hall ...	Ship
ZVE	Amberton ...	Ship	ZZE	Massis ...	Ship
ZVF	Aral ...	Ship	ZZG	Laurel Branch	Ship
ZVH	Nurtureton ...	Ship	ZZI	Grelwen ...	Ship
ZVI	Apple Leaf ...	Ship	ZZL	Cypria ...	Ship
ZVJ	Middleham		ZZM	Plum Leaf ...	Ship
	Castle ...	Ship	ZZN	Cherry Leaf ...	Ship
ZVL	Lord Byron ...	Ship	ZZO	Pear Leaf ...	Ship
ZVM	Hornby Castle	Ship	ZZP	Orange Leaf ...	Ship
ZVT	Vigo ZVT ...	Ship	ZZQ	Bramble Leaf	Ship
ZVU	Aleppo ZVU ...	Ship	ZZR	Aragaz ...	Ship
ZVV	Morocco ...	Ship	ZZS	Hyrcania ...	Ship
ZVW	Agnes Duncan	Ship	ZZV	Pavia ...	Ship
ZVX	Zamora ...	Ship	ZZW	Tyrla ...	Ship
ZWA	Millgate ...	Ship	ZZX	Eastway ...	Ship

5 IT	Aberdeen		2 ZY	Manchester	
	Broadcasting	G.B.		Broadcasting	G.B.
	Birmingham		5 NO	Newcastle	
	Broadcasting	G.B.		Broadcasting	G.B.
	Cardiff			Plymouth	
2 LO	Broadcasting	G.B.		Broadcasting	G.B.
	Glasgow		2 MT	Writtle	
	Broadcasting	G.B.		Experimental	G.B.
	London				
	Broadcasting	G.B.			

HYDROGRAPHIC, METEORO- LOGICAL, TIME AND GENERAL SIGNALS

A. Meteorological.

B. Time.

C. Hydrographic.

D. General.

A.—METEOROLOGICAL SECTION.

The *International Commission of Weather Telegraphy* is the body charged with the responsibility of devising an International Code for unifying the system of collecting and distributing meteorological information by wireless. Before the war the recognised, and practically the only method of exchange of weather information, was by ordinary telegram and cable. A certain number of reports were received from ships by W/T, although these reports were by no means regular in coming to hand. The Eiffel Tower station had made some headway by issuing a weather report which included information received from a very limited number of reporting stations in Western Europe.

The nature and extent of the present arrangements for collecting and distributing this information is set out in the following pages. A tabular form has been adopted, as it seems the most suitable from the point of view of clearness and easy reference.

Meteorological information issued by W/T comes within one or more of the following headings :—

(a) *A weather report*, which is a statement of the present or existing weather conditions. This report may be either a report for a single station or, more generally, it contains information of existing weather at several stations over a comparatively large area at a certain instant of time. In the latter case it is known as a "synoptic data message." Such messages, when decoded and plotted on a map known as a *synoptic chart*, enable the observer to forecast the weather in the locality covered by the chart.

(b) *A weather forecast*, which is an opinion of future weather conditions issued by a Central Meteorological Office in possession of the information to be obtained from a synoptic chart.

Or (c) *A storm warning*, which is only broadcast when weather conditions are abnormal and shipping or aviation is thereby endangered.

Unfortunately it will be only too evident from the following pages that among the different countries issuing meteorological reports there are many departures from, or modifications of, the International Code. The problem of unifying the different forms of report bristles with difficulties owing to the variety of interests involved. Let us consider just one problem which will serve to illustrate what is meant. The situation with which the European Meteorological Services is confronted is materially different from that which presents itself to the American Services. In the one case, that of Europe, the territory within the control of each is relatively small, and it is almost imperative that an agreement should be reached to bring about a uniform method of exchange. The United States, on the other hand, is more immediately concerned with meteorological problems of a more domestic character, such as the interests of shipping about its own shores and in the Caribbean Sea, and for this purpose a word code (in contra-distinction to a numeral code) is found to be more suitable.

The past year has been a remarkable one in several ways. It has witnessed the inauguration of the first long distance continental exchange, namely, the report issued daily from the Eiffel Tower as the International Collective Report. This report contains observations from several North American stations. The exchange has certainly been of material benefit to the professional meteorologists of Western Europe in general, and our own country in particular. The "dream" of British meteorologists is now becoming a reality, as the obstacle of our own peculiar insular position is at last being overcome. For this International Collective Report enables the professional forecaster to have before him a complete synoptic chart of the North Atlantic on which he can trace the travel of depressions long

before they reach our western seaboard. In the realm of pure meteorology progress has been made with the scheme of erecting a circle of meteorological stations (equipped with wireless apparatus) around the North Pole. The chain of stations is now in process of establishment. The observatories at Spitzbergen, which have now been in existence some time, constitute the first link. The Jan Mayen station, erected during the year on the initiative of the Norwegian Meteorological Service, forms the second link. Already on several occasions wireless warnings from Jan Mayen of approaching tempests have averted much damage to Scandinavian shipping. As the circum-polar chain nears completion, pure meteorology will be enhanced by data for testing the Polar theory of Professor Bjerknes.

As to the future, progress may be expected in two directions:—

(a) By "speeding-up" the issue of reports from central stations so that a "lapse" of not more than from one and a half to two hours shall intervene between the times of observation of the various meteorological elements and their distribution by wireless. This desirable feature postulates that in the case of ships at sea reporting to a central office, a rapid and efficient service for passing the messages to shore stations and thence to the central office should be organised without delay. The needs of ships at sea in regard to weather information will march hand in hand with the requirement of aircraft. The importance of both services will therefore steadily increase.

(b) Progress may also be expected in the direction of drawing up a carefully conceived time-table of transmission times, so that the greatest possible use may be made of the existing reports, and that they may be made available for the greatest number of countries wishing to have them.

It is also to be hoped that in the next issue of the YEAR-BOOK, departures from and modifications of the International Code will be less frequent than in the pages which follow.

ABBREVIATIONS.

The following abbreviations are used throughout the section:—

- bar = barometer or barometric.
- (c) = Coastal station.
- °c = degrees centigrade.
- cw = continuous wave.
- F = Forecast.
- °F = degrees Fahrenheit.
- G.M.T. = Greenwich Mean Time.
- I = Ice report.
- (L) = Inland station.
- L.T. = local time.
- m = metres.
- mb = millibar(s).
- mm = millimetres.
- mod = modified.
- m.s.l. = mean sea level.
- N = Navigation warning.
- N.I.C. = New International Code.
- O = Ship observations from ships at sea.
- ob = observation(s) or observatory.
- O.I.C. = Old International Code.
- p.l. = plain language.
- R/T = Radio-telephony.
- S = surface observations.
- sp. = spark.
- temp. = temperature.
- T.S. = Time Signal.

- U.A.T. = Upper air temperature observations.
 U.W. = Upper air wind observations.
 U.R.S.I. = Union Radioscopique Internationale.
 W. = Storm warning.
 W.R. = Weather report.
 [] Signifies that word(s) or figure(s) printed within these brackets vary according to the time of message.
 “ ” Signifies that letters or figures contained within inverted commas are sent exactly as printed and are not coded.

CODES

THE (NEW) INTERNATIONAL CODE

I.—THE SYMBOLS AND THEIR MEANINGS.

- A = Form of *predominating cloud lowest* in the scale of cloud forms (*see* Code VI).
 a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists (*see* Code VI).
 BBB = Pressure in millibars and tenths (initial 9 or 10 omitted), or millimetres and tenths (initial 7 omitted). The values refer to sea level and include all corrections for index error, temperature and gravity.
 BB = Pressure in whole millibars or whole millimetres (initial 9, 10 or 7 omitted). (For upper air reports of pressure, temperature and humidity, BB is in whole millibars with the hundreds figure omitted, whether this is 9, 8, 7, 6, or 5.)
 B₁B₁B₁ = Pressure in whole millibars at an “inversion of temperature” in upper air reports.
 b = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres. For tendencies 10–19 the *second* figure only is reported and 33 is added to the wind direction number (DD). For tendencies greater than 29 the *second* figure only is reported and 67 added to the wind direction number. Tendencies greater than 29 are reported as 29.
 C = Form of predominating cloud, according to the scale of cloud forms, when only one form is reported, as from ships at sea (*see* Code VI).
 C₁ = Form of cloud observed by nephoscope; usually one of the two highest layers present (*see* Code VI).
 Ca = Form of low cloud observed by nephoscope in reports for aviation (*see* Code VI).
 c = Characteristic of barometric tendency during the period of 3 hours preceding the time of observation (*see* Code II).
 DD = Direction of the wind near the ground on the scale (01–32) in which 08 = East, 16 = South, etc., 00 = calm.
 dd = Direction of wind in the upper air, or of cloud movement, on the scale (01–36), *i.e.*, degrees from North divided by 10 and rounded off to the nearest whole number (00 = calm).
 d = Direction from which swell comes on scale (0–8), in which 2 = East, 4 = South, etc., 0 = no swell.
 d_s = Direction of movement of ship on scale (0–8), in which 2 = Eastwards, 4 = Southwards, etc.

- F = Force of the wind on the Beaufort Scale. (Forces above 9 are reported as 9 in telegrams, with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as "Storm ten," force 11 as "Storm eleven." Ships at sea, however, report "gale ten," "storm eleven," "hurricane twelve.")
- F₁ = Approximate speed of low cloud (*see* Code XIV).
- GG = Greenwich Time of observation (01 = 1 a.m., 12 = noon, 13 = 1 p.m., 24 = midnight).
- H = Relative humidity of the air (*see* Code V).
- h = Height of base of lowest cloud present (*see* Code VII).
- H₁ = Heights at which upper air temperature and humidity are reported (no code figure telegraphed) (*see* Code XII).
- h₁ = Height at which upper wind is reported (*see* Code XI).
- InIn = Index number of station.
- jj = Meaning varies according to time of observation and between inland and coastal stations, as follows:—
- | | Inland.
Stations. | Coastal.
Stations. |
|----------------------|----------------------|-----------------------|
| At 0700 G.M.T. - - - | jj = mm | jj = SVs |
| At 1800 G.M.T. - - - | jj = MM | jj = SVs |
- K = The characteristic of the swell *in the open sea* (*see* Code IX (a)).
- K' = Amount and characteristic of barometric tendency expressed by a single figure (*see* Code II (a)).
- L = Amount of sky (scale 0-10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high) as A, if "a" refers to a different layer.
- LLL = Latitude in degrees and tenths, the tenths being obtained by dividing the number of minutes by 6 and neglecting the remainder.
- lll = Longitude in degrees and tenths, the tenths being obtained as for latitude LLL.
- MM = Maximum temperature in the interval of 11 hours ending at 18 h. G.M.T. (or at one of the hours 1 h., 7 h., 13 h., 18 h. G.M.T., following not less than 4 hours after noon, local time).
- mm = Minimum temperature in the interval of 13 hours ending at 7 h. G.M.T. (or at the hour 13 hours after the time of reporting the maximum temperature).
- N = Total amount of sky covered with cloud (scale 0-10).
- P = Day of the week. 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. The day refers to G.M.T. and not to local time, *e.g.*, Sunday means the period from 0 h. to 24 h. on Sunday at Greenwich.
- Q = Quarter of globe in which ship is situated (*see* Code XIII).
- RR = Rainfall [at 7 a.m. for preceding 13 hours and at 6 p.m. for preceding 11 hours (*see* Code VIII)].
- R = Amount of rainfall for the preceding 24 hours (*see* Code VIII (a)).
- r = Time of commencement of precipitation (*see* Code X).
- S = State of the sea and swell (coast stations) (*see* Code IX).
- TT = Temperature of the air in whole degrees Fahrenheit or Centigrade (50 added to negative values).
- tt = Temperature of the sea (surface water) in whole degrees.
- TTT = Temperature of air in degrees and tenths Fahrenheit or Centigrade (500 added to negative values).
- ttt = Temperature of the sea (surface water) in degrees and tenths.

- $t_1 t_1$ = Increase in temperature at an "inversion" in whole degrees.
 V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night) (see Code IV).
 v = Visibility at sea from ships at sea (see Code IV (a)).
 V_s = Visibility towards the sea (from coast stations) (see Code IV).
 VV = The relative speed of clouds as determined by nephoscope and such that the actual speed of the cloud will be given in kilometres per hour by the equation $vv = \frac{h}{1000} \times VV$, if "h," the height of the cloud, is expressed in metres. This unit is the "radian per hour."
 vv = The speed of the wind in the upper air in kilometres per hour or miles per hour.
 W = The weather in the interval since the preceding time of report. This interval is 5, 6 or 7 hours for stations reporting 4 times daily. (For special reports for aviation it is 1 hour or 2 hours) (see Code III).
 ww = The actual weather at the time of observation with which is combined, whenever possible, the general character of the weather (see Code I).
 w_1 = The initial figure of the code ww , thus indicating the general state of the weather.
 x_1 = A check figure obtained by adding the first four figures of the group and taking the units figure in the sum so obtained.
 x_2, x_3, x_4, x_5 = Check figures obtained in a similar manner.
 y_1 = A check figure obtained by adding together the first figure of each of the preceding groups, thus: $Q + P + B + F + w$, and taking the units figure of the sum.
 y_2, y_3, y_4 = Check figures obtained in a similar way from the 2nd, 3rd and 4th figures respectively.
 z = Key figure obtained by adding together all the x 's or all the y 's.

II.—SYMBOLIC FORM OF MESSAGES.

(I) REPORTS FROM LAND STATIONS.

- (a) The form for observations at 0100 and 1300 G.M.T. is—
 BBBDD FwwTT cbWVH ALaNH C₁ddVV,
 and for observations at 0700 and 1800 G.M.T.—
 BBBDD FwwTT cbWVH ALaNH RRjir C₁ddVV,
 where jj in the fifth group is replaced, as follows:—

	Inland Stations.	Coastal Stations.
at 0700 G.M.T.	mm	SV _s
at 1800 G.M.T.	MM	SV _s

The group $C_1 ddVV$, containing cloud observations by nephoscope, is omitted entirely* if no such observations are available.

(b) *Upper Winds* are reported by groups of the form $h_1 ddvv$, one group being used for each height.

(c) *Upper Air Temperatures and Humidities* are reported by groups of the form BBTTH.

In this case no figure is telegraphed to indicate the height, it being understood that the groups refer to the heights of the code H_1 in order.

Inversions are reported at the end by groups 0000 $B_1 B_1 B_1 t_1 t_1$, the first being an index group indicating that an inversion is reported, while $B_1 B_1 B_1$ is the pressure in whole millibars at the height of the inversion, and $t_1 t_1$ the increase of temperature in whole degrees.

(d) In *Collective Messages* the observations of each station are preceded by a group consisting of the index number of the station (usually two figures)

*The general rule in reports of all kinds is, however, that missing figures shall be replaced by hyphens (one for each figure).

by which it is identified. The messages are arranged in sections, the first containing the ordinary observations from *all* stations, the second, preceded by the word "Pilot" or an equivalent, containing all reports of upper wind and the third, preceded by "Temp" or an equivalent, containing all observations of upper air temperature.

Any other observations, such as those from ships, form a fourth section.

The symbolic form of a complete message, embracing surface observations at 0700 or 1800 G.M.T., upper winds and upper air temperatures and humidities, would be as follows, where the observations contained in the groups in each line, refer to the stations indicated by the index figures, I_1I_1 , I_2I_2 , etc., preceding them.

	I_1I_1	BBBDD	FwwTT	cbWVH	ALaNH	RRjJR	C _a ddVV
	I_2I_2	BBBDD	FwwTT	cbWVH	ALaNH	RRjJR	C _a ddVV.
	I_3I_3	BBBDD,	etc.,				
	etc.						
Pilot	I_1I_1	h_1 ddvv	h_1 ddvv	h_1 ddvv.			
	I_2I_2	h_1 ddvv	h_1 ddvv	h_1 ddvv.			
	I_3I_3	h_1 ddvv,	etc.				
	etc.						
	etc.						
Temp.	I_1I_1	BBTTH	BBTTH,	etc.			00000
	B_1B_1	t_1t_1 ,	etc.				
	I_2I_2	BBTTH	BBTTH,	etc.			00000
	B_1B_1	t_1t_1 ,	etc.				
	I_3I_3	BBTTH,	etc.,				
	etc.						
	etc.						

For observations at other hours the form would be the same, except that the group RRjJR would not be included.

(2) REPORTS FROM SHIPS AT SEA.

These are in the form :—

QLLL_x Plll_x BBBDD_x FvKdx₄ wwGGx₅ $y_1y_2y_3y_4z$
 { CNTTd_s WrttK' (if temperature on Fah. scale).
 { CNTTT Wrttt (if temperature on C. scale).

An alternative form for use without check figures is :—

PQLLL lllGG BBDDF wwvKd.
 { CNTTd_s WrttK' (if temperature on Fah. scale).
 { CNTTT Wrttt (if temperature on C. scale).

(Both these forms are operative at present, but a decision between the two forms is to be made by the Permanent International Meteorological Committee after consultation of the different services affected.)

(3) HOURLY REPORTS FOR AVIATION AND OTHER SPECIAL PURPOSES.

(a) The normal form for hourly reports is :—

$I_nI_n(V_s)$ wwVhL NDDEFW

with the addition, every three hours, of a group—

CaddF₁S,

where C_a is the type of cloud to which ddF₁ refer.

(b) If fuller information is required, then every three or six hours the form is—

$I_nI_n(V_s)$ BBBDD FwwTT cbWVH ALaNH CaddF₁S.

NOTE.—When, for any reason, V_s is not available, no hyphen is inserted in its place. If none of the information in the group CaddF₁S is available the whole group is omitted. In all other cases hyphens are used, in the normal way, to denote lack of information.

(4) ABBREVIATED REPORTS FOR COLLECTIVE MESSAGES COVERING A WHOLE CONTINENT.

The form of report for each station is:—

BBDDE w₁TTK'R for observations at 0700 G.M.T;BBDDE w₁TTK'W for observations at other hours.

III.—SPECIFICATION OF THE SCALES.

CODE I.

Weather at actual time of observation and general character of weather (ww).



In interpreting reports it is to be noted that, as a rule, the largest number in the scale which is appropriate to the weather is reported.)

		Code figures.
<i>Fine or Fair</i> (Cloud 0-5).	Cloud decreasing	00
	No apparent change	01
	Cloud increasing	02
	Precipitation within sight	03
	With solar or lunar halo	04
	After fog or mist (or dust storm)	05
	After rain or drizzle	06
	After snow, sleet or hail	07
	With or after thunder and lightning in neighbourhood	08
	After thunderstorm	09
<i>Cloudy or Overcast</i> (Cloud 6-10).	Cloud decreasing	10
	No apparent change	11
	Cloud increasing	12
	Precipitation within sight	13
	With solar or lunar halo	14
	After fog or mist (or dust storm)	15
	After rain or drizzle	16
	After snow, sleet or hail	17
	With or after thunder and lightning in neighbourhood	18
	After thunderstorm	19
<i>Fog or Mist.</i>	Fog or mist but clear in zenith	20
	" and apparently overcast	21
	" but clear in zenith	22
	" and apparently overcast	23
	" but clear in zenith	24
	" and apparently overcast	25
	Fog or mist but clear in zenith	26
	" and apparently overcast	27
	" but clear in zenith	28
	" and apparently overcast	29
<i>Passing Showers.</i>	Slight with rain	30
	" hail or rain and hail	31
	" sleet	32
	" snow	33
	Heavy with rain becoming better	34
	" rain	35
	" rain becoming worse	36
	" hail or rain and hail	37
	" sleet	38
	" snow	39

<i>Drizzle.</i>	{	Slight occasional	40
		" continuous	41
		but increasing	42
		Moderate but decreasing	43
		" occasional	44
		" continuous	45
		but increasing	46
		Thick but decreasing	47
		" occasional	48
		" continuous	49
<i>Rain.</i>	{	Slight occasional	50
		" continuous	51
		but increasing	52
		Moderate but decreasing	53
		" occasional	54
		" continuous	55
		but increasing	56
		Heavy but decreasing	57
		" occasional	58
		" continuous	59
<i>Snow or Snow and Hail.</i>	{	Slight occasional	60
		" continuous	61
		but increasing	62
		Moderate but decreasing	63
		" occasional	64
		" continuous	65
		but increasing	66
		Heavy but decreasing	67
		" occasional	68
		" continuous	69
<i>Sleet or Rain and Snow.</i>	{	Slight occasional	70
		" continuous	71
		but increasing	72
		Moderate but decreasing	73
		" occasional	74
		" continuous	75
		but increasing	76
		Heavy but decreasing	77
		" occasional	78
		" continuous	79
<i>Hail or Rain and Hail.</i>	{	Slight occasional	80
		" continuous	81
		but increasing	82
		Moderate but decreasing	83
		" occasional	84
		" continuous	85
		but increasing	86
		Heavy but decreasing	87
		" occasional	88
		" continuous	89
<i>Thunderstorm (or Line squall).</i>	{	Slight thunderstorm without hail	90
		" " " with hail	91
		Moderate thunderstorm without hail	92
		" " " with hail	93
		Heavy thunderstorm without hail	94
		" " " with hail	95
		" " " without hail	96
		" " " with hail	97
		Line squall without hail	98
		" " " with hail	99


SYMBOLIC VERSION OF ABOVE CODE (FOR SYNOPTIC CHARTS).

Present Weather Code (ww).

First fig. } Second figure.*	0	1	2	3	4	5	6	7	8	9
0	bc—	bc	bc+	bcv	bc ⊕	bc/f	bc/r	bc/s	betl	bc/tlr
1	co—	co	co+	cov	co	co/f	co/r	co/s	cotl	co/tlr
2	fb	fo	ifb	ifo	fb—	fo—	ffb	ffo	fb+	fo+
3	pr ₀	ph ₀	pr ₀ +	ps ₀	PR—	PR	PR+	PH	PRS	PS
4	d ₀	d ₀ d ₀	d ₀ +	d—	d	dd	d+	D—	D	DD
5	r ₀	r ₀ r ₀	r ₀ +	r—	r	rr	r+	R—	R	RR
6	s ₀	s ₀ s ₀	s ₀ +	s—	s	ss	s+	S—	S	SS
7	rs ₀	rs ₀ rs ₀	rs ₀ +	rs—	rs	rsrs	rs+	RS—	RS	RSRS
8	h ₀ (r ₀)	rh ₀ rh ₀	h ₀ (r ₀)+	h(r)—	h(r)	rhrrh	h(r)+	H(R)—	H(R)	RHRH
9	tlr ₀	tlrh ₀	tlr	tlrh	TLR	TLRH	TLR 	TLRH 	KQ	KQH

A solidus (/) such as occurs in the combination "bc/r," separates weather at the time of observation from the preceding weather, bc/r thus indicates "fine or fair after rain or drizzle."

The letters have the following meanings:—

- b = fine (blue sky; not more than $\frac{1}{4}$ sky covered).
- bc = fair sky partly cloudy, $\frac{1}{2}$ covered).
- c = cloudy (sky $\frac{3}{4}$ covered).
- d = drizzle.
- f = fog.
- h = hail.
- i = intermittent (occasional).
- j = adjacent (*i.e.*, in vicinity of station).
- KQ = line squall.
- l = lightning.
- o = overcast.
- p = passing showers.
- r = rain.
- s = snow.
- t = thunder.
- tlr = thunderstorm.
- ⊕ = halo.
-  = gale.

The following additional letters are sometimes used in maps:—

- e = wet air without rain falling (a copious deposit of water on trees, buildings or rigging).
- g = gloomy.
- m = mist.
- q = squally.
- u = ugly, threatening.
- v = extreme visibility (the horizon or distant hills unusually clear).
- w = dew.
- x = hoar frost.
- y = dry air (humidity below 60 per cent.).
- z = haze (dust haze, the turbid atmosphere of dry weather).

Continuity is indicated as in the above table by repetition of letters, thus :
 rr = continuous rain. Intensity is indicated by employing capitals, thus :
 R = heavy rain and RR continuous heavy rain. A suffix ₀ means "slight,"
 thus : rs₀ = slight sleet. + means increasing and — diminishing in intensity
 or amount.

KQ = line squall (*i.e.*, very heavy squalls, with change of wind direction
 and fall of temperature).

CODE II.

*Characteristic of Barometric Tendency during the three hours preceding the
 time of observation (c).*

Code figure.		
0 = 0 or +	..	Steady or rising.
1 = + 0	..	Rising then steady.
2 = + —	..	Rising then falling.
3 = — + or 0 +	..	Falling or steady then rising.
4 = unsteady +	..	Unsteady but rising.
5 = —	..	Falling.
6 = — 0	..	Falling then steady.
7 = — +	..	Falling then rising.
8 = 0 — or + —	..	Steady or rising then falling.
9 = unsteady —	..	Unsteady but falling

The barometer is now
 higher than or the
 same as three hours
 ago.

The barometer is now
 lower than three
 hours ago.

CODE II. (a).

*Amount and Characteristic of Barometric Tendency expressed by a single
 figure (K').*

Code figure.		Change in last 3 hours in half-millibars.
0	Barometer steady.	0 or 1
1	Barometer rising slowly.	2 or 3
2	Barometer rising.	4 to 7
3	Barometer rising quickly.	8 to 12
4	Barometer rising very rapidly.	more than 12
5	Barometer falling slowly.	2 or 3
6	Barometer falling.	4 to 7
7	Barometer falling quickly.	8 to 12
8	Barometer falling very rapidly.	more than 12

CODE III.

Past Weather in interval since last report (W).

Code figure.	
0 —	Fair or fine.
1 —	Cloudy.
2 —	Overcast continuously.
3 —	Fog or mist.
4 —	Thick fog.
5 —	Passing showers.
6 —	Rain or drizzle.
7 —	Snow or sleet.
8 —	Hail or rain and hail.
9 —	Thunderstorm.

Without
 precipitation.

Precipitation.

CODE IV.
Horizontal Visibility (V) and (Vs).

Code
figure.

- 0 = Objects not visible at 50 metres (55 yards).
- 1 = Objects not visible at 200 metres (220 yards).
- 2 = Objects not visible at 500 metres (550 yards).
- 3 = Objects not visible at 1,000 metres (1,100 yards).
- 4 = Objects not visible at 2,000 metres (1½ miles).
- 5 = Objects not visible at 4,000 metres (2½ miles).
- 6 = Objects not visible at 10,000 metres (6¼ miles).
- 7 = Objects not visible at 20,000 metres (12½ miles).
- 8 = Objects not visible at 50,000 metres (31¼ miles).
- 9 = Objects visible at 50,000 metres or more.

CODE IV (a).
Horizontal Visibility from Ships at Sea (v).

Code
Figure.

- 0 = Dense fog, objects not visible at 50 yards.
- 1 = Thick fog, objects not visible at 1 cable.
- 2 = Fog, objects not visible at 2 cables.
- 3 = Moderate fog, objects not visible at ½ mile (nautical).
- 4 = Thin fog or mist, objects not visible at 1 mile (nautical).
- 5 = Visibility poor, objects not visible at 2 miles (nautical).
- 6 = Visibility moderate, objects not visible at 5 miles (nautical).
- 7 = Visibility good, objects not visible at 10 miles (nautical).
- 8 = Visibility very good, objects not visible at 30 miles (nautical).
- 9 = Visibility exceptional, objects visible more than 30 miles (nautical).

CODE V.
Relative Humidity (H).

Code
Figure.

0	..	..	..	..	..	..	..	95 to 100 per cent.
9	..	..	..	..	..	..	..	90 to 94 per cent.
8	..	..	..	..	..	..	..	80 to 89 per cent.
7	..	..	..	..	..	..	..	70 to 79 per cent.
6	..	..	..	..	..	..	..	60 to 69 per cent.
5	..	..	..	..	..	..	..	50 to 59 per cent.
4	..	..	..	..	..	..	..	40 to 49 per cent.
3	..	..	..	..	..	..	..	30 to 39 per cent.
2	..	..	..	..	..	..	..	20 to 29 per cent.
1	..	..	..	..	..	..	..	10 to 19 per cent.

CODE VI.
Cloud Form (A, a, C, C₁ Ca).

Code
Figure.

1	..	..	Cirrus	..	..	..	Ci.
2	..	..	Cirro-Stratus	..	..	..	Ci. St.
3	..	..	Cirro-Cumulus	..	..	..	Ci. Cu.
4	..	..	Alto-Cumulus	..	..	..	A. Cu.
5	..	..	Alto-Stratus	..	..	..	A. St.
6	..	..	Strato-Cumulus	..	..	..	St. Cu.
7	..	..	Nimbus	..	..	..	Nb.
8	..	..	Cumulus or Fracto-Cumulus	..	..	..	Cu. or Fr. Cu.
9	..	..	Cumulo-Nimbus	..	..	..	Cu. Nb.
0	..	..	Stratus or Fracto-Stratus	..	..	..	St. or Fr. St.

CODE VII.

Height of Base of Lowest Cloud present (h).

Code Figure.	Metres.	Feet.
0	0 to 50	0 to 150
1	50 to 100	150 to 300
2	100 to 200	300 to 600
3	200 to 300	600 to 1000
4	300 to 600	1000 to 2000
5	600 to 1000	2000 to 3000
6	1000 to 1500	3000 to 5000
7	1500 to 2000	5000 to 6500
8	2000 to 2500	6500 to 8000
9	No low cloud	No low cloud

CODE VIII.

Amount of Rainfall (RR).

This is expressed in whole millimetres with the following exceptions:—
Specification of certain meanings.

Code Figures.	Meaning.
91	0.1 mm.
92	0.2 mm.
93	0.3 mm.
94	0.4 mm.
95	0.5 mm.
96	0.6 mm.
97	Some rain but not measurable.
98	More than 90 mm.
99	Measurement impossible or unreliable.

CODE VIII (a).

Amount of Rainfall during preceding 24 hours (R).

Code Figure.	
0	No rain.
1	Trace or 0.1 mm.
2	0.2 to 2 mm.
3	3 to 5 mm.
4	6 to 10 mm.
5	11 to 15 mm.
6	16 to 20 mm.
7	21 to 30 mm.
8	31 to 50 mm.
9	above 50 mm.

CODE IX.

State of Sea and Swell (S).

Code figure.		
0	No swell	} Calm or slight sea.
1	Moderate swell	
2	Heavy swell.	} Moderate sea.
3	No swell.	
4	Moderate swell	
5	Heavy swell.	
6	Rather rough sea.	
7	Rough sea.	
8	Very rough sea.	
9	Mountainous sea.	

CODE IX (a).

Characteristic of Swell in the Open Sea (K).

Code figure.

0	No or slight swell.	} and sea smooth to moderate.
1	..	..	Moderate swell.
2	..	..	Heavy swell.
3	..	..	Long low swell.
4	Confused swell.	} and sea rough.
5	..	..	No or slight swell.
6	..	..	Moderate swell.
7	..	..	Heavy swell.
8	..	..	Long low swell.
9	..	..	Confused swell.

CODE X.

Time of Commencement of Precipitation (r).

Code figure.

0	..	..	..	No rain.
1	..	..	..	0 to 1 hour before time of observation.
2	..	..	..	1 to 2 hours before time of observation.
3	..	..	..	2 to 3 hours before time of observation.
4	..	..	..	3 to 4 hours before time of observation.
5	..	..	..	4 to 5 hours before time of observation.
6	..	..	..	5 to 6 hours before time of observation.
7	..	..	..	6 to 8 hours before time of observation.
8	..	..	..	8 to 10 hours before time of observation.
9	..	..	..	above 10 hours before time of observation.
-	..	..	..	No observation.

CODE XI.

Height at which Upper Wind is reported (h_1).

The heights at which the upper wind is reported are the *three* heights selected from the following list which give the best representation of the result of the pilot-balloon ascent.

Code figure.	Metres.	Feet (used in British reports).
1	200	or 1,000
2	500	or 2,000
3	1,000	or 3,000
4	1,500	or 5,000
5	2,000	or 7,000
6	3,000	or 10,000
7	4,000	or 13,000
8	5,000	or 17,000
9	6,000	or 20,000

CODE XII.

Heights at which Upper Air Temperatures and Humidity are reported (H_1) (no code figure telegraphed).

200 metres	} above ground.
500 metres	
1,000 metres	
1,500 metres	
2,000 metres	} above mean sea level.
2,500 metres	
3,000 metres	
4,000 metres	
5,000 metres	
6,000 metres	

CODE XIII.

Quarter of Globe (Q).

Code figure.	Latitude.	Longitude.	
1	N.	W.	Barometer in millibars.
2	N.	E.	
3	S.	W.	
4	S.	E.	
5	N.	W.	Barometer in millimetres.
6	N.	E.	
7	S.	W.	
8	S.	E.	

CODE XIV.

Approximate Speed of Low Cloud (F_1).

Code Figure.	Corresponding Mean Speed.		Limits of Speed.	
	If in km. per hour.	If in miles per hour.	If in km. per hour.	If in miles per hour.
0	Less than 5	Less than 5	0-7	0-4
1	15	10	8-22	5-14
2	30	20	23-37	15-24
3	45	30	38-52	25-34
4	60	40	53-67	35-44
5	75	50	68-82	45-54
6	90	60	83-97	55-64
7	105	70	98-112	65-74
8	120	80	113-127	75-84
9	135	90	128-142	85-94

THE OLD INTERNATIONAL CODE

I.—THE SYMBOLS AND THEIR MEANINGS.

BBB is the corrected barometric pressure in tenths of mm. (the first figure 7 is omitted).

DD is direction of the wind (true, not magnetic) on scale (0-32), where 02 = NNE, 04 = NE, etc. 32 = N., 0 = calm.

F is strength of the wind on Beaufort Scale (0-12) (for numbers above 9, the figure 9 is reported and actual force given in words at end).

W is state of the sky (see Code I).

TT is temperature in whole degrees centigrade. 50 is added to the number when the temperature is below zero.

C is direction of motion of upper clouds (see Code II).

β is characteristic of barometric tendency (see Code III).

bb is the amount of the tendency in tenths of mm.; 50 is added to the wind direction number (DD) if the tendency is negative.

RR is rainfall in mm., in past 24 hours (see Code VI, for special meanings).

MM is maximum temperature
mm is minimum temperature

From 7 h. of the preceding day to 7 h. of the day of observation. These are in whole degrees Centigrade, 50 being added if the temperature is below zero.

u is sea disturbance (see Code IV).

W' is characteristic of past weather sent at the end of the second group in place of C in 18 h. messages (see Code V).

(InIn is the index number of the reporting station.)

II.—SYMBOLIC FORM OF MESSAGES.

Observations at 1800 G.M.T.—BBBDD FWTTW'.

Observations at 0700 G.M.T.—BBBDD FWTT C β bbRR MMmmu.

III.—SPECIFICATION OF THE SCALES.

CODE I.

State of the Sky (W).

Code figure.

- 0 Sky cloudless.
- 1 Sky $\frac{1}{4}$ covered.
- 2 Sky $\frac{2}{4}$ covered.
- 3 Sky $\frac{3}{4}$ covered.
- 4 Sky overcast.

Code figure.

- 5 Rain.
- 6 Snow.
- 7 Mist.
- 8 Fog.
- 9 Thunderstorm.

CODE II.

Direction of Upper Cloud (Cirrus and Cirro Stratus) (C).

Code figure.

- 0 Clouds with no appreciable movement.
- 1 Clouds from N.E.
- 2 Clouds from E.
- 3 Clouds from S.E.
- 4 Clouds from S.

Code figure.

- 5 Clouds from S.W.
- 6 Clouds from W.
- 7 Clouds from N.W.
- 8 Clouds from N.
- 9 No observation.

CODE III.

Characteristic of Tendency (β).

Figures characterising the change of pressure during the 3 hours preceding the observation.

Code figure.

- 0 Barometer steady.
- 1 Barometer unsteady.
- 2 Barometer rising.
- 3 Barometer falling.
- 4 Barometer falling then rising
- 5 Barometer steady then rising.

Code figure.

- 6 Barometer steady then falling.
- 7 Barometer falling then steady.
- 8 Barometer rising then steady or falling.
- 9 Line squall.

CODE IV.

Sea Disturbance (μ).

Code figure.

- 0 Sea calm.
- 1 Sea very smooth.
- 2 Sea smooth.
- 3 Sea slight.
- 4 Sea moderate.

Code figure.

- 5 Sea rather rough.
- 6 Sea rough.
- 7 Sea high.
- 8 Sea very high.
- 9 Sea phenomenal.

CODE V.

Characteristic of past Weather (W').

Code figure.

- 0 Mainly fine.
- 1 Fair (high clouds preponderating).
- 2 Mainly overcast (low clouds preponderating).
- 3 Sheet lightning (more than one flash).
- 4 Precipitation, mainly during forenoon, without thunderstorms or with at most one peal of thunder without lightning.
- 5 Precipitation, mainly during afternoon, without thunderstorms or with at most one peal of thunder without lightning.
- 6 Mainly foggy.
- 7 Thunderstorm.
- 8 Passing showers squally changeable weather (with bright intervals).
- 9 Persistent precipitation (including falls of snow or soft hail of long duration, sky overcast during the intervals).

CODE VI.

Rainfall (RR).

The following code figures are used with a special significance.

Code figures.

- 00 No precipitation.
- 99 Precipitation has occurred but its amount has not been measured.
- 98 Precipitation exceeding 96 mm.
- 97 "Trace" of precipitation, amount less than 0.5 mm.

Amounts exceeding 96 mm. are reported in full at the end of the message, the figures 98 being inserted in the coded part.

LINDENBERG CODE FOR UPPER AIR INFORMATION

Upper Winds.—ZZWVc HHDDF HHDDF addf.

Upper Air Temperature, etc.—HHTTT PPDDF HHTTT PPDDF
.... ZZWVc.

(NOTE.—addf is a nephoscope group identified by its only containing four figures.)

The symbols have the following meanings :—

- ZZ = Hour of observations (Central European Time. Subtract one hour to get G.M.T.).
- W = Present weather in Old International Code.
- V = Horizontal visibility in New International Code.
- c = Barometric tendency (Code I below).
- HH = Height above sea level in hectometres.
- DD = Wind direction at height HH. Scale 0-32 (08 = East, etc.)
- F = Wind force at height HH. (Code II below.)
- a = Kind of upper cloud observed by nephoscope. (Code III.)
- dd = Direction from which upper cloud moves. Scale 0-32 (08 = East, etc.).
- f = Velocity-height ratio.
- TTT = Temperature at height HH in degrees and tenths Centigrade (500 added for negative values).
- PP = Percentage relative humidity (98 means 100 per cent. ; 99 means "impossible to report").

CODE I.

Barometric Tendency (c).

Code figure.

- | | | | |
|---|-----------------------------------|-------|---------------------------------|
| 0 | No appreciable variation : | .. .. | less than 0.5 mm. (in 3 hours). |
| 1 | Slow fall | .. .. | 0.5 mm. to 1.4 mm. |
| 2 | Moderate fall | .. .. | 1.5 mm. to 2.4 mm. |
| 3 | Rapid fall | .. .. | 2.5 mm. to 3.4 mm. |
| 4 | Very rapid fall | .. .. | more than 3.4 mm. |
| 5 | Slow rise.. | .. .. | 0.5 mm. to 1.4 mm. |
| 6 | Moderate rise | .. .. | 1.5 mm. to 2.4 mm. |
| 7 | Rapid rise | .. .. | 2.5 mm. to 3.4 mm. |
| 8 | Very rapid rise | .. .. | more than 3.4 mm. |
| 9 | Unsteady or impossible to report. | | |

CODE II.

Wind Speed (F).

This is expressed in metres per second.

For values 10 to 19, the number 33 is added to the figures giving wind direction DD, thus 578 means W. 18 m. per sec.

For values 20 to 29, the number 67 is added to the figures giving wind direction DD, thus 973 means NNW 23 m. per sec.

Values above 30 m. per sec. are given in words, thus:—

"976 36 sek" means NNW 36 m. per sec.

CODE III.

Upper Cloud (a).

1. Cirrus.
2. Cirro-stratus.
3. Cirro-cumulus.
4. Alto-cumulus.

EIFFEL TOWER CODE FOR UPPER WINDS

Direction of Upper Winds (D).

<i>a</i> = N.N.E.	<i>e</i> = E.S.E.	<i>i</i> = S.S.W.	<i>m</i> = W.N.W.
<i>b</i> = N.E.	<i>f</i> = S.E.	<i>j</i> = S.W.	<i>n</i> = N.W.
<i>c</i> = E.N.E.	<i>g</i> = S.S.E.	<i>k</i> = W.S.W.	<i>o</i> = N.N.W.
<i>d</i> = E.	<i>h</i> = S.	<i>l</i> = W.	<i>p</i> = N.

Speed of Upper Wind (V) in Metres per second.

<i>a</i> = 0	<i>g</i> = 12	<i>m</i> = 24	<i>s</i> = 36
<i>b</i> = 2	<i>h</i> = 14	<i>n</i> = 26	<i>t</i> = 38
<i>c</i> = 4	<i>i</i> = 16	<i>o</i> = 28	<i>u</i> = 40
<i>d</i> = 6	<i>j</i> = 18	<i>p</i> = 30	<i>v</i> = 42
<i>e</i> = 8	<i>k</i> = 20	<i>q</i> = 32	<i>w</i> = 44
<i>f</i> = 10	<i>l</i> = 22	<i>r</i> = 34	<i>y</i> = 46
			<i>z</i> = 48

AMERICAN CODE

(1).—SURFACE OBSERVATIONS (2 groups of 5 figures each).

First group of 5 figures—BBBDF.

BBB = barometric pressure in *inches* and hundredths, reduced to sea level (first figure omitted).

D = direction of surface wind.

0 = calm or no movement.

1 = N, 2 = N.E., 3 = E., 4 = S.E., 5 = S., 6 = S.W.,
7 = W., 8 = N.W.

F = force of wind on Beaufort Scale as in N.I.C. (except that forces 10, 11 and 12 are reported simply as 9 without any addition in plain language).

SECOND GROUP OF 5 FIGURES.—W¹bWAC.

W¹ = prevailing weather or state of weather at surface at time of ob.

1 = clear (3-tenths or less clouded).

2 = partly cloudy (4 to 7-tenths clouded).

- 3 = cloudy (8 to 10-tenths clouded).
- 4 = raining.
- 5 = snowing.
- 6 = thunderstorm.
- 7 = sleeting or hailing.
- 8 = dense fog.

b = pressure change in hundredths of an inch during 2 hr. preceding ob.

- 0 = change of less than 0.04 inch.
- 1 = increase of 0.04 inch.
- 2 = decrease of 0.04 inch.
- 3 = increase of 0.06 inch.
- 4 = decrease of 0.06 inch.
- 5 = increase of 0.08 inch.
- 6 = decrease of 0.08 inch.
- 7 = increase of 0.10 inch.
- 8 = decrease of 0.10 inch.
- 9 = increase or decrease of 0.12 inches or more (whether it is an increase or decrease can be determined by barometric tendency shown at surrounding stations).

W = amount of clouds—number of tenths of the sky obscured.

- 0 = 1-tenth of sky or less covered.
- 2 = 2 to 3-tenths of sky covered.
- 4 = 4 to 5-tenths of sky covered.
- 6 = 6 to 7-tenths of sky covered.
- 8 = 8 to 10-tenths of sky covered.
- 10 = total cloudiness.

A = kinds of clouds.

- 0 = 1-tenth clouds or less (kind not indicated).
- 1 = upper clouds (cirrus, cirro-stratus, cirro-cumulus, alto-cumulus, or alto-stratus), rapidity not indicated.
- 2 = strato-cumulus moving slowly.
- 3 = strato-cumulus moving rapidly.
- 4 = cumulus moving slowly.
- 5 = cumulus moving rapidly.
- 6 = stratus moving slowly.
- 7 = stratus moving rapidly.
- 8 = nimbus or cumulo-nimbus moving slowly.
- 9 = nimbus or cumulo-nimbus moving rapidly.

C = direction of cloud movement.

- 0 = no movement observable.
- 1 = north.
- 2 = north-east.
- 3 = east.
- 4 = south-east.
- 5 = south.
- 6 = south-west.
- 7 = west.
- 8 = north-west.

When both upper and lower clouds are observed, only the amount, kind, and direction of the lower clouds will be sent. In such cases the amount of the upper clouds, if any, can be determined approximately by taking the difference between the tenths of cloudiness interpreted from the figures showing "present weather" and "amount of clouds."

(2)—UPPER AIR OBSERVATIONS. $3 D_1 V_1 D_2 V_2 \quad 4 D_3 V_3 D_4 V_4$, etc.

The upper air observations are included in five groups and have identifying numbers 3 to 7, inclusive. The wind direction and force are indicated by the same numerals as for surface wind direction and force.

THIRD GROUP (upper air).—Two levels are included in this group, 250 metres and 500 metres. The first figure (3) identifies the group; the second figure indicates the wind direction at the lower elevation and the third figure the wind force at the lower elevation; the fourth and fifth

figures represent, respectively, the wind direction and force at the higher elevation.

FOURTH GROUP (upper air).—Includes 1,000 and 1,500 metre elevations; same arrangement of the five significant figures as in the third group.

FIFTH GROUP (upper air).—Includes 2,000 and 3,000 metre elevations; same arrangement of the five significant figures as in the third group.

SIXTH GROUP (upper air).—Includes 4,000 metre elevation; same arrangement, as in the third group, except that there will be only three figures in this group, followed by XX, as elevations in excess of 4,000 metres are reported only in the last group.

LAST GROUP (upper air).—Shows the highest elevation reached. The first figure (7) identifies the group as the one showing the maximum altitude, (it may be the fourth, fifth, sixth or seventh group, dependent upon the actual elevation reached); the second and third figures indicate the elevation in hundreds of metres; the fourth and fifth figures wind direction and velocity, respectively, at the indicated elevation. When the maximum elevation is 9,900 metres or more the figures 99 will be used.

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION, JULY, 1912.

EXTRACT.

XIII.—METEOROLOGICAL TRANSMISSIONS, TIME SIGNALS, AND OTHER TRANSMISSIONS.

XLV.

Meteorological and other Messages.

1. The Administrations shall take the necessary steps to supply their coast stations with meteorological telegrams containing the particulars of interest to the district of such stations. These telegrams, the text of which must not exceed twenty words, shall be sent to the ships which ask for them. The charge for these meteorological telegrams shall be carried to the account of the ships to which they are addressed.

2. The meteorological observations, made by certain ships appointed for that purpose by the country to which they belong, may be sent once a day as paid service advices, to the coast stations authorised to receive them by the Administrations concerned, who shall also appoint the meteorological offices to which these observations shall be addressed by the coast station.

3. Time signals and meteorological telegrams shall be transmitted in succession one to another in such a way that the total duration of their transmission does not exceed ten minutes. In principle, while they are being sent, radiotelegraph stations, transmission by which might disturb the reception of these signals and telegrams, shall keep silent so as to allow all stations which desire to do so to receive these telegrams and signals. Exception shall be made in the case of distress calls and State telegrams.

4. The Administrations shall facilitate the communication to the marine information agencies which they may appoint of the information respecting wrecks and casualties at sea, or presenting a general interest for navigation, which the coast stations can communicate regularly.

REGULATIONS FOR THE SAFETY OF NAVIGATION.

(*Extracted from the Report of the International Conference on Safety of Life at Sea, 1914.*)

ARTICLE I.

Code for the transmission by Radiotelegraphy of Information relating to Ice, Derelicts, and Weather.

INSTRUCTIONS.

Transmission of Information.—The transmission of information concerning ice and derelicts is obligatory. This information may be sent from ship to

ship or to the Hydrographic Office, Washington, either in clear or by means of the abbreviations used in Part I of this Code.

The transmission of information relating to weather is optional. Part II of this Code may be used for this purpose, but may be modified at any time by the Meteorological Congress.

Information required :

PART I.—ICE AND DERELICTS.

1. The kind of ice or derelict observed.
2. The position of ice or derelict when last determined.

PART II.—METEOROLOGICAL INFORMATION.

1. The direction and force of the wind.
2. The set and velocity of the current.
3. Weather or state of the sky at a fixed hour.
4. Height of barometer and air temperature.
5. Barometric tendency and sea-surface temperature.

The time to be adopted :

In all radiotelegrams relating to ice or derelicts the times shall be given in Greenwich mean time.

The Address :

Reports, when sent to the Hydrographic Office, Washington, should be addressed "Hydrographic"; reports to the Meteorological Office, London, should be addressed "Meteorology."

The Message :

1. When sending information about ice or derelicts alone, two groups of five figures each are used, preceded by the word "ice"; these groups may be repeated as often as necessary.

2. If meteorological information is to be sent in addition, a further four groups of five figures each are used, preceded by the word "weather." These groups are inserted at the end of the message after all the information relating to ice has been given.

N.B.—If the message contains the word "weather," all the code groups before that word give information relating to ice, and those after the word "weather" give meteorological information. If there is no word "weather" in the message, it only contains information about ice. (See examples of the two kinds of message given in this Article.)

PART I.

ICE AND DERELICTS.

Information respecting ice and derelicts is given by means of ten figures divided into two groups of five figures each. These groups are preceded by the word "ice."

Two figures ... The day of the month (*dd*), according to Code I.

One figure ... The time of observation (*T*), according to Code II.

One figure ... The kind of ice observed (*I*), according to Code III.

Three figures ... The latitude of the ice observed (*ppp*), to tenths of a degree (*see table below*).

Three figures ... The longitude of the ice observed (*p'p'p'*), to tenths of a degree (*see table below*).

The first group consists of *ddTIp*.

The second group consists of *ppp'p'p'*.

CODES.

CODE I.—Day of the Month.

The day of the month is given by two figures, of which the first may be zero: 01 to 31.

CODE II.—Time of Observation.

The time of observation is included between—

	Code No.
1 a.m. and 4 a.m. Greenwich Mean Time	1
4 a.m. and 7 a.m.	2
7 a.m. and 10 a.m.	3
10 a.m. and 1 p.m.	4
1 p.m. and 4 p.m.	5
4 p.m. and 7 p.m.	6
7 p.m. and 10 p.m.	7
10 p.m. and 1 a.m.	8

CODE III.—Nature of Ice or Derelict Observed.

0. No ice observed.

1. Single iceberg. Huge mass of floating ice.

2. Several icebergs.

3. Numerous icebergs.

4. Floeberg. Thick piece of salt-water ice like a small iceberg.

5. Field ice. Ice extending as far as the eye can reach, but through which it is possible to navigate.

6. Pack ice. Pieces of ice broken from berg or floe, partly closed together.

7. Land ice. Ice attached to the shore since the winter.

8. Derelict.

9. (Not allotted.)

EXAMPLE.

Message sent from Ship to Ship.

—	First Message.	Coded as	Second Message.	Coded as	Third Message.	Coded as	Fourth Message.	Coded as
Date of observation	15	15	15	15	15	15	16	16
Time of observation	10 a.m.— 1 p.m.	4	4 p.m.— 7 p.m.	6	7 p.m.— 10 p.m.	7	4 a.m.— 7 a.m.	2
Nature of ice or derelict	Field	5	Numerous icebergs	3	Derelict	8	Single iceberg	1
Position of ice or derelict	Latitude 45° 42'	457	Latitude 46° 05'	461	Latitude 46° 25'	464	Latitude 47° 19'	473
	Longitude 46° 11'	462	Longitude 44° 40'	447	Longitude 43° 58'	440	Longitude 40° 15'	402

The code of the above message would thus be :

S.S. to S.S.

Ice, 15454, 57462 : 15634, 61447 : 15784, 64440 : 16214, 73402.

PART II.

METEOROLOGICAL INFORMATION.

Information respecting weather, etc., is given by four groups of five figures each. These groups are preceded by the word "weather."

First Group (DDPP) :

The day of the month : two figures (DD), according to Code I.

The position of the ship when transmitting the message.

Second Group (WWCCX) :

Wind direction and force, at 8 a.m. at the 75th meridian of west longitude : two figures (WW), according to Code V.

Set and velocity of current : two figures (CC), according to Code VI.

Weather or state of the sky at the same hour : one figure (X), according to Code VII.

Third Group (BBBA) :

The barometric height to tenths of a millimetre at 8 a.m. at the 75th meridian of west longitude : three figures (BBB), according to Code VIII.

Air temperature at the same hour : two figures (AA), according to Code IX.

Fourth Group (bbSSS) :

Barometric tendency, at 8 a.m. at the 75th meridian of west longitude : two figures (bb), according to Code X.

Sea surface temperature at the same hour : three figures (SSS), according to Code XI.

CODES.

CODE IV.—*Position of Ship.*

The position of the ship when the meteorological data given in Part II were observed.

CODE V.

Wind Direction (to 16 points, and *Wind Force*, at 8 a.m. mean time at the 75th meridian of west longitude (WW).

—	Wind Force, Beaufort Scale.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.
Calm	0	00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Light breeze ..	1, 2 or 3	01	07	13	19	25	31	37	43	49	55	61	67	73	79	85	91
Moderate breeze ..	4 or 5	02	08	14	20	26	32	38	44	50	56	62	68	74	80	86	92
Strong wind ..	6 or 7	03	09	15	21	27	33	39	45	51	57	63	69	75	81	87	93
Gale force ..	8 or 9	04	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94
Storm force ..	10 or 11	05	11	17	23	29	35	41	47	53	59	65	71	77	83	89	95
Hurricane ..	12	06	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96

N.B.—The wind direction is to be referred to true bearings.

CODE VI.

Direction (to 16 points) and *Velocity of the Current* (CC).

Nautical Miles per hour	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.
0.25	01	07	13	19	25	31	37	43	49	55	61	67	73	79	85	91
0.5	02	08	14	20	26	32	38	44	50	56	62	68	74	80	86	92
1	03	09	15	21	27	33	39	45	51	57	63	69	75	81	87	93
2	04	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94
3	05	11	17	23	29	35	41	47	53	59	65	71	77	83	89	95
4	06	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
00	No current.															
99	No observation.															

N.B.—The current is to be referred to true bearings.

CODE VII.

The State of the Sky (X), at 8 a.m. mean time at the 75th meridian of west longitude :—

0. Sky quite clear.
1. Sky quarter clouded.
2. Sky half clouded.
3. Sky three-quarters clouded.
4. Sky entirely overcast.
5. Rain falling.
6. Snow or hail falling.
7. Haze or mist.
8. Fog.
9. Thunderstorm.

CODE VIII.—*Height of Barometer* (BBB).

The reading of the mercury barometer is to be corrected for index error, and reduced to 0° C. and sea level.

The corrected reading is coded by omitting the first figure of the barometer reading in tenths of a millimetre : for example, 761.2 mm. is coded as 612.

CODE IX.

Air Temperature (AA) is coded in two figures according to the following table—

Degrees Centigrade.	Degrees Fahrenheit.	Code No.	Degrees Centigrade.	Degrees Fahrenheit.	Code No.
-15.0	5.0	00	10.0	50.0	50
-14.5	5.9	01	10.5	50.9	51
-14.0	6.8	02	11.0	51.8	52
-13.5	7.7	03	11.5	52.7	53
-13.0	8.6	04	12.0	53.6	54
-12.5	9.5	05	12.5	54.5	55
-12.0	10.4	06	13.0	55.4	56
-11.5	11.3	07	13.5	56.3	57
-11.0	12.2	08	14.0	57.2	58
-10.5	13.1	09	14.5	58.1	59
-10.0	14.0	10	15.0	59.0	60
-9.5	14.9	11	15.5	59.9	61
-9.0	15.8	12	16.0	60.8	62
-8.5	16.7	13	16.5	61.7	63
-8.0	17.6	14	17.0	62.6	64
-7.5	18.5	15	17.5	63.5	65
-7.0	19.4	16	18.0	64.4	66
-6.5	20.3	17	18.5	65.3	67
-6.0	21.2	18	19.0	66.2	68
-5.5	22.1	19	19.5	67.1	69
-5.0	23.0	20	20.0	68.0	70
-4.5	23.9	21	20.5	68.9	71
-4.0	24.8	22	21.0	69.8	72
-3.5	25.7	23	21.5	70.7	73
-3.0	26.6	24	22.0	71.6	74
-2.5	27.5	25	22.5	72.5	75
-2.0	28.4	26	23.0	73.4	76
-1.5	29.3	27	23.5	74.3	77
-1.0	30.2	28	24.0	75.2	78
-0.5	31.1	29	24.5	76.1	79
0.0	32.0	30	25.0	77.0	80
0.5	32.9	31	25.5	77.9	81
1.0	33.8	32	26.0	78.8	82
1.5	34.7	33	26.5	79.7	83
2.0	35.6	34	27.0	80.6	84
2.5	36.5	35	27.5	81.5	85
3.0	37.4	36	28.0	82.4	86
3.5	38.3	37	28.5	83.3	87
4.0	39.2	38	29.0	84.2	88
4.5	40.1	39	29.5	85.1	89
5.0	41.0	40	30.0	86.0	90
5.5	41.9	41	30.5	86.9	91
6.0	42.8	42	31.0	87.8	92
6.5	43.7	43	31.5	88.7	93
7.0	44.6	44	32.0	89.6	94
7.5	45.5	45	32.5	90.5	95
8.0	46.4	46	33.0	91.4	96
8.5	47.3	47	33.5	92.3	97
9.0	48.2	48	34.0	93.2	98
9.5	49.1	49	34.5	94.1	99

CODE X.—*Barometric Tendency (bb).*

By the "barometric tendency at a given hour" is meant the amount by which the barometric height has changed during the preceding three hours. It is to be expressed in millimetres. For example, the barometric tendency at 8 a.m. could be obtained by comparing the reading taken at that hour, say 755.7 mm., with a reading taken at 5 a.m., say 759.3 mm. In this case the barometric tendency would be expressed by a fall of 3.6 millimetres. As a general rule the barometric tendency is to be determined from the trace of the barograph.

The barometric tendency is coded in two figures, according to the following table:—

Rise in Barometer,		Code No.	Fall in Barometer		Code No.
Millimetres.	Inches.		Millimetres.	Inches.	
0.0—0.4	0.00—0.01	01	0.0—0.4	0.00—0.01	51
0.5—0.9	0.02—0.03	02	0.5—0.9	0.02—0.03	52
1.0—1.4	0.04—0.05	03	1.0—1.4	0.04—0.05	53
1.5—1.9	0.06—0.07	04	1.5—1.9	0.06—0.07	54
2.0—2.4	0.08—0.09	05	2.0—2.4	0.08—0.09	55
2.5—2.9	0.10—0.11	06	2.5—2.9	0.10—0.11	56
3.0—3.4	0.12—0.13	07	3.0—3.4	0.12—0.13	57
3.5—3.9	0.14—0.15	08	3.5—3.9	0.14—0.15	58
4.0—4.4	0.16—0.17	09	4.0—4.4	0.16—0.17	59
4.5—4.9	0.18—0.19	10	4.5—4.9	0.18—0.19	60
5.0—5.4	0.20—0.21	11	5.0—5.4	0.20—0.21	61
5.5—5.9	0.22—0.23	12	5.5—5.9	0.22—0.23	62
6.0—6.4	0.24—0.25	13	6.0—6.4	0.24—0.25	63
6.5—6.9	0.26—0.27	14	6.5—6.9	0.26—0.27	64
7.0—7.4	0.28—0.29	15	7.0—7.4	0.28—0.29	65
7.5—7.9	0.30—0.31	16	7.5—7.9	0.30—0.31	66
8.0—8.4	0.32—0.33	17	8.0—8.4	0.32—0.33	67
8.5—8.9	0.34—0.35	18	8.5—8.9	0.34—0.35	68
9.0—9.4	0.36—0.37	19	9.0—9.4	0.36—0.37	69
9.5—9.9	0.38—0.38	20	9.5—9.9	0.38—0.38	70
10.0—10.4	0.39—0.40	21	10.0—10.4	0.39—0.40	71
10.5—10.9	0.41—0.41	22	10.5—10.9	0.41—0.42	72
11.0—11.4	0.43—0.44	23	11.0—11.4	0.43—0.44	73
11.5—11.9	0.45—0.46	24	11.5—11.9	0.45—0.46	74
12.0—12.4	0.47—0.48	25	12.0—12.4	0.47—0.48	75
12.5—12.9	0.49—0.50	26	12.5—12.9	0.49—0.50	76
13.0—13.4	0.51—0.52	27	13.0—13.4	0.51—0.52	77
13.5—13.9	0.53—0.54	28	13.5—13.9	0.53—0.54	78
14.0—14.4	0.55—0.56	29	14.0—14.4	0.55—0.56	79
14.5—14.9	0.57—0.58	30	14.5—14.9	0.57—0.58	80
15.0—15.4	0.59—0.60	31	15.0—15.4	0.59—0.60	81
15.5—15.9	0.61—0.62	32	15.5—15.9	0.61—0.62	82
16.0—16.4	0.63—0.64	33	16.0—16.4	0.63—0.64	83
16.5—16.9	0.65—0.66	34	16.5—16.9	0.65—0.66	84
17.0—17.4	0.67—0.68	35	17.0—17.4	0.67—0.68	85
17.5—17.9	0.69—0.70	36	17.5—17.9	0.69—0.70	86
18.0—18.4	0.71—0.72	37	18.0—18.4	0.71—0.72	87
18.5—18.9	0.73—0.74	38	18.5—18.9	0.73—0.74	88
19.0—19.4	0.75—0.76	39	19.0—19.4	0.75—0.76	89

Rise in Barometer.		Code No.	Fall in Barometer.		Code No.
Millimetres.	Inches.		Millimetres.	Inches.	
19.5—19.9	0.77—0.78	40	19.5—19.9	0.77—0.78	90
20.0—20.4	0.79—0.80	41	20.0—20.4	0.79—0.80	91
20.5—20.9	0.81—0.82	42	20.5—20.9	0.81—0.82	92
21.0—21.4	0.83—0.84	43	21.0—21.4	0.83—0.84	93
21.5—21.9	0.85—0.86	44	21.5—21.9	0.85—0.86	94
22.0—22.4	0.87—0.88	45	22.0—22.4	0.87—0.88	95
22.5—22.9	0.89—0.90	46	22.5—22.9	0.89—0.90	96
23.0—23.4	0.91—0.92	47	23.0—23.4	0.91—0.92	97
23.5—23.9	0.93—0.94	48	23.5—23.9	0.93—0.94	98
24.0—24.4	0.95—0.96	49	The barometric tendency cannot be reported.		99

CODE XI.—Sea Surface Temperature (SSS).

Sea surface temperature to tenths of a degree Centigrade, is coded by three figures, or, when necessary, by two figures preceded by zero. If the temperature is negative, the first of these three figures is 5.

For example:—

— 2.2° C. is coded as 522.

+ 1.0° C. is coded as 010.

+ 15.6° C. is coded as 156.

TABLE FOR CONVERTING MINUTES TO TENTHS OF A DEGREE.

Minutes.	Tenths of a degree.									
0-3	0
4-9	1
10-15	2
16-21	3
22-27	4
28-33	5
34-39	6
40-45	7
46-51	8
52-57	9
58-59	10

Example.

Message containing Meteorological Information.

Ice :

	First Message.	Coded as	Second Message.	Coded as
Date of observation ..	21	21	22	22
Time of observation ..	1 p.m.—4 p.m.	5	4 a.m.—7 a.m.	2
Nature of ice or derelict ..	Single iceberg.	1	Field ice	5
Position of ice or derelict {	Latitude 44° 35'	446	Latitude 42° 58'	430
	Longitude 43° 15'	432	Longitude 47° 03'	470

Weather :

—————	First Message.	Coded as	Second Message.	Coded as
Date of observation ..	21	21	22	22
Position of ship ..	Latitude 45° 13'	825	Latitude 43° 47'	863
	Longitude 42° 05'		Longitude 46° 33'	
Direction and force of wind	E.S.E. 5	26	S.W. 2	55
Set and velocity of current	N.W. 2 m-h.	82	S.S.E. 1 m-h.	39
Weather	Sky clear	0	Fog	8
Barometer	765.3 mm.	653	753.2 mm.	532
Air temperature ..	15.3° C.	61	9.8° C.	50
Barometric tendency ..	Rise .8	02	Fall 2.7	56
Sea-surface temperature ..	1.4° C.	014	— .7° C.	507

The Code of the above message sent to the Meteorological Office would thus be:—

Meteorology : Ice ; 21514, 46432 : 22254, 30470 : Weather ; 21825, 26820, 65361, 02014 : 22863, 55398, 53250, 56507.

ARTICLE II. SAFETY SIGNAL.

The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power :
— — — (T T T).

In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress.

The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes.

The Governments of the Contracting States will select the stations which are to send out mariners safety information of an urgent character.

When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

FORECAST CODE.

The Forecast Code is used in the Coded Forecasts for various districts in the British Isles.

Districts.—The area covered by the forecast is included in the message in each case. Normally the areas within which the different forecasts are applicable are, roughly, as follows:—

Group 111	Southern England (central part) : Dorset, Wiltshire, Berkshire, Hampshire.
Group 222	South-East England : London, Middlesex, Essex, Surrey, Sussex, Kent.
Group 333	Yorkshire, Lincolnshire, Nottinghamshire.
Group 444	South-East Scotland (places within a 50-mile radius of North Berwick).
Group 555	South-West England : Devonshire and Cornwall.
Group 666	North-West district : Lancashire, Cheshire, Shropshire and North Wales.
Group 999	England and Southern Scotland taken collectively. The forecast for this group is appended to the "General Inference" issued at 2000 G.M.T.

Form of Message.

A message in code consists of a number of five-figure groups relating to the weather, followed by further groups of five figures which are added as *check groups*. A complete decode of a specimen message is given at the end of the Forecast Code (below), from which the method of adding check groups may be understood.

In addition to the five-figure groups, words in plain English are often inserted in the message. In each group, *with the exception of check groups*, the nature of the information contained in that group is determined by the initial figure or figures, the meaning of which is as follows:—

<i>Initial figure or figures.</i>	<i>Information given where group is not a check group.</i>
09	Day of the week and hour of observations used in the message.
08	Latitude or longitude of place to which information in succeeding group or groups refers, when that place has <i>not</i> both North latitude and West longitude.
00—07 (inclusive)	Latitude and longitude of place to which information in succeeding group or groups refer when that place has both North latitude and West longitude.
1	Types of pressure distribution and changes.
2	Time and area covered by the general forecast (when used more than once in a message:—time and area to which the groups immediately following it refer).
	N.B.—The time specified may be the present. The groups can therefore be used for defining the position of a depression or anticyclone.
3	Wind direction.
4	Wind force.
50—53 (inclusive)	Wind direction and velocity.
59	Changes of wind.
6	Height table.
7	Temperature.
8	Mist, fog and visibility.
90	Cloudiness.
91	Rain, hail, snow, etc., or thunderstorms.
92	Barometric changes in past three hours.

In any case where the information corresponding with any figure cannot be given, a hyphen is inserted in place of the figure. In the computation of check figures the hyphen is counted as zero.

METHOD OF DECODING GROUPS.

Initial Figure 08.

All groups beginning with 08 occur in pairs. The first group of the pair gives the quarter of the globe (third figure) and the latitude in whole degrees (fourth and fifth figures) of the place to which the information refers—the second group of the pair gives the longitude (third, fourth and fifth figures) to the nearest whole degree.

The code for indicating the quarter of the globe (third figure of first group) is as follows:—

<i>Code Number</i>	<i>Latitude</i>	<i>Longitude</i>
1	N	W
2	N	E
3	S	W
4	S	E

Example :

08256 08004
means latitude 56° N. longitude 4 E.
08250 08014
means latitude 50° N. longitude 14 E.

(For special arrangement for the North Atlantic, see initial figure 00-07.)

Initial Figure 09.

DATE AND HOUR OF REPORT.

All groups commencing with 09 refer to the day of the week and the hour (G.M.T.) of the observations on which the report is based. The last three figures of such groups specify :

Third Figure.—Day of the week (see table below).

Fourth and Fifth Figures.—Hour of the day of the observations on which the report is based, the hours being numbered from 01 to 24 (12 noon, 24 midnight).

Example :

09418 Weather report based on observations on Wednesday at 6 p.m. (18h G.M.T.).

TABLE FOR THIRD FIGURE.

Day of Week.						Code Figure.
Sunday	..	..	..	..	..	1
Monday	..	..	..	..	..	2
Tuesday	..	..	..	..	..	3
Wednesday	..	..	..	..	..	4
Thursday	..	..	..	..	..	5
Friday	..	..	..	..	..	6
Saturday	..	..	..	..	..	7

Initial Figures 00 to 07, inclusive.

All groups beginning with 0 except 08 and 09 (see above) give the North latitude and West longitude of the place to which the information refers.

The second and third figures give the North latitude in whole degrees.

The fourth and fifth figures give the West longitude in whole degrees.

This group is suitable for describing positions in the Atlantic and over the extreme Western parts of Europe and North Africa and the Eastern parts of North America.

Example :

05632 means latitude 56 N. longitude 32 W.

Initial Figure 1.

Type of pressure distribution and anticipated motion thereof.

All groups commencing with 1 refer to the type of pressure distribution, and the anticipated direction of motion of the system described. The position of a depression or anticyclone is inserted immediately before this group, and may either be stated in words or be denoted by giving its latitude and longitude (by groups beginning with 00, 01, etc., up to 08), or by using the group beginning with 2. The last 4 figures of these groups specify respectively :—

Second Figure—Type of pressure distribution.

Third Figure—Changes in the nature of the system.

Fourth and Fifth Figures—Direction towards which motion is anticipated.

Second Figure.

Type of Pressure Distribution.

0—Type of pressure distribution unchanged since previous report.

1—Anticyclone off

2—Anticyclone centred over (or near)

3—Extensive anticyclone covering

4—Anticyclone wedge

- 5—Depression centred off
- 6—Depression centred over (or near)
- 7—Depression covering wide area centred over (or near)
- 8—V-shaped depression, trough over
- 9—Secondary depression (or depressions).

*Third Figure.**Changes in Nature of System.*

- 0—No important change in progress.
- 1—(a) Circulation of wind increasing in cyclone accompanied by fall of pressure near the centre.
(b) Rise of pressure in anticyclone near the centre.
- 2—(a) Circulation of wind increasing in cyclone without marked change of pressure near the centre.
(b) No marked change of pressure near the centre in anticyclone.
- 3—(a) Circulation of wind decreasing accompanied by rise of pressure near the centre.
(b) Fall of pressure near the centre in anticyclone.
- 4—(a) Circulation of wind decreasing in cyclone but no marked change of pressure near the centre.
(b) No marked change of pressure near the centre in anticyclone.
- 5—Spreading in the direction given by the last two figures in the group (without necessarily any change in the position of the centre).
- 6—Extending its influence generally.
- 7—System has appeared since last report was sent.
- 8—System not actually shown on the map but the general distribution of pressure suggests its early development.
- 9—Changes either complex or expressible by a group commencing with 92 (*see below*).

*Fourth and Fifth Figures.**Directions towards which motion is anticipated in points.*

- (08—towards East, 16—towards South, 32—towards North, etc.)
- 00—remaining stationary.
- 99—no specification of direction.

Examples :

- (1) 20046 12100—Stationary anticyclone over England, with rising barometer near its centre.
- (2) 20048 18708—V-shaped depression with trough over Ireland has appeared since last report was sent, and will move eastwards.
- (3) 20045 19812—Conditions favourable for development of secondary depressions over the British Isles moving towards the south-east.

Initial Figure 2.

TIME AND AREA COVERED BY FORECAST (OR AREA COVERED IN STATEMENT OF EXISTING CONDITIONS).

All groups commencing with figure 2, when not stating simply an area, give the time and area to which the forecast is applicable, or the time and area to which the forecast group or groups immediately following this "2" group refer; in such cases the forecast groups are themselves followed either by another "2" group, or, if they complete the message, by check groups.

The last four figures of a "2" group specify respectively:

Second and Third Figures—(1) The number of hours covered by the forecast reckoned from the hour of observation specified at the beginning of the message. *Figures 00 indicate that the following groups give a statement of conditions prevailing at that hour, and not a forecast.* (2) Figures 51-94. The time at which a change is expected to take place.

Fourth and Fifth Figures.—The area to which the forecast (or description) applies.

Second and Third Figures.
Time.

00—Statement of conditions at the fixed hour (given by group commencing 09).

01—No specification.

12—Forecast for ensuing 12 hours.

24—Forecast for ensuing 24 hours.

36—Forecast for ensuing 36 hours.

48—Forecast for ensuing 48 hours.

97—Outlook beyond period of forecast.

98—Outlook for two or three days beyond period of forecast.

Forecast for a change to take place at about the times indicated.

51	To-night.	74	About 4 a.m.
52	To-morrow.	75	" 5 a.m.
53	This afternoon.	76	" 6 a.m.
54	To-morrow morning.	77	" 7 a.m.
55	To-morrow night.	78	" 8 a.m.
56	Later.	79	" 9 a.m.
57	At first.	80	" 10 a.m.
58	For a few days.	81	" 11 a.m.
59	For a spell.	82	" noon.
60	After to-morrow.	83	" 1 p.m.
61	Sunday.	84	" 2 p.m.
62	Monday.	85	" 3 p.m.
63	Tuesday.	86	" 4 p.m.
64	Wednesday.	87	" 5 p.m.
65	Thursday.	88	" 6 p.m.
66	Friday.	89	" 7 p.m.
67	Saturday.	90	" 8 p.m.
70	About midnight.	91	" 9 p.m.
71	" 1 a.m.	92	" 10 a.m.
72	" 2 a.m.	93	" 11 p.m.
73	" 3 a.m.	94	" midnight.

Fourth and Fifth Figures.
Place or Area.

Places.

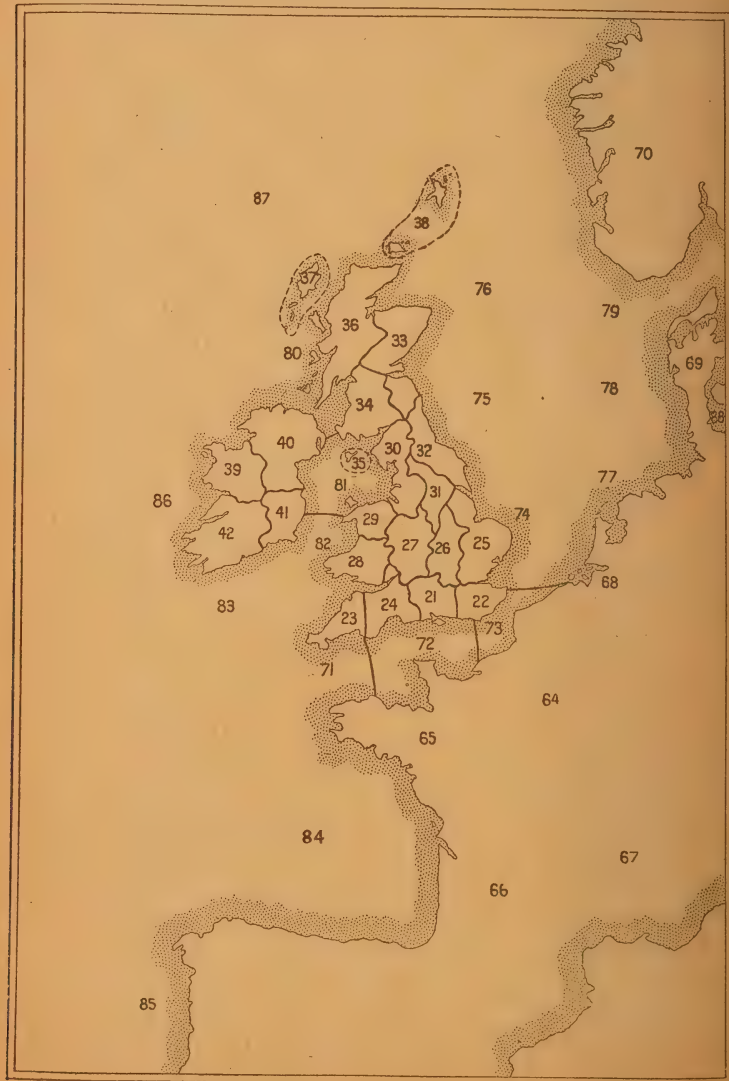
00	London.	07	Sheffield.	14	Brussels.
01	Edinburgh.	08	Manchester.	15	Amsterdam.
02	Dublin.	09	Newcastle.	16	Copenhagen.
03	Plymouth.	10	Glasgow.	17	Berlin.
04	Birmingham.	11	Aberdeen.	18	Lyons.
05	Hull.	12	Belfast.	19	Rome.
06	Liverpool.	13	Paris.	20	Locality of addressee.

Districts of British Isles.

(See map.)

21	South-Eastern England (Western part).
22	South-Eastern England (Eastern part).
23	South-Western England (Western part).
24	South-Western England (Eastern part).
25	Eastern England.
26	Eastern Midlands.
27	Western Midlands.
28	South Wales.
29	North Wales.
30	North-Western England.
31	Northern Midlands.
32	North-Eastern England.
33	Eastern Scotland.
34	South-Western Scotland.
35	Isle of Man.

- 36 North and North-West Scotland.
- 37 Hebrides.
- 38 Orkneys and Shetlands.
- 39 North-Western Ireland.
- 40 North-Eastern Ireland.
- 41 South-Eastern Ireland.
- 42 South-Western Ireland.
- 43 Region within radius of 20 miles of addressee.
- 44 Region within radius of 100 miles of addressee.



Combinations of Districts of the British Isles.

		<i>Districts.</i>
45	British Isles	(21-42)
46	England	(21-32)
47	Scotland	(33-38)
48	Ireland	(39-42)
49	England and Scotland	(21-42)
50	Southern Section of Britain	(21-29)
51	Northern Section of Britain	(30-38)
52	Ireland and Scotland	(33-42)
53	Southern Section of British Isles	(21-29 and 41-42)
54	Northern Section of British Isles	(30-40)
55	South-West England	(23-24)
56	South-Western Section of British Isles	(23, 24, 28, 41 and 42)
57	South-East England	(21-22)
58	South-Eastern Section of British Isles	(21, 22, 25-27)
59	North-Western Section of British Isles	(29-30, 34-37, 39-40)
60	North-Eastern Section of British Isles	(32, 33 and 38)
61	Western Part of England	(23-24, 28-30)
62	Eastern Part of England	(21, 22, 25, 26, 31 and 32)
63	Northern England and South Scotland	(29-35)

Continental Districts

64	France (North-Eastern Part).
65	" (North-Western Part).
66	" (South-Western Part).
67	" (South-Eastern Part).
68	Holland and Belgium.
69	Denmark.
70	Southern Norway.

Sea Districts.

71	English Channel (Western Part).
72	" " (Central Part).
73	" " (Eastern Part).
74	North Sea (South-Western Part).
75	" " (Central-Western Part).
76	" " (North-Western Part).
77	" " (South-Eastern Part).
78	" " (Central-Eastern Part).
79	" " (North-Eastern Part and Skagerak).
80	North Channel to Minch.
81	Irish Sea.
82	St. George's Channel and Bristol Channel.
83	Atlantic Ocean (Southward of Ireland).
84	Atlantic Ocean (Bay of Biscay).
85	Atlantic Ocean (off Iberian Coast).
86	Atlantic Ocean (Westward of Ireland).
87	Atlantic Ocean (Scotland to Iceland).
88	Baltic (Western part).

Combinations of Oceanic and Continental Districts.

		<i>Districts.</i>
89	North Sea	(72-77)
90	North Sea (Western half)	(72-74)
91	" " (Eastern half)	(75-77)
92	" " (Northern Part)	(74-77)
93	" " (Southern Part)	(72, 75)
94	" " (Central Part)	(73, 76)

- 95 Eastern Channel and South-Western Part of
 North Sea (71, 72)
 96 English Channel (69-71)
 97 S.E. England to N.E. France (22, 71, 62)
 98 S. England and Northern France (21-24, 69-71, 62-63)
 99 No specification.

Examples :

- 20021—Conditions prevailing at the time indicated by the first group of the message over the western part of S.E. England.
 22429—Forecast for the ensuing 24 hours for N. Wales.
 26012—After to-morrow in Belfast.

Initial Figure 3.

WIND DIRECTION.

All groups commencing with figure 3 refer to Wind Direction which is specified in points.

02—N.N.E.	18—S.S.W.
04—N.E.	20—S.W.
06—E.N.E.	22—W.S.W.
08—E.	24—W.
10—E.S.E.	26—W.N.W.
12—S.E.	28—N.W.
14—S.S.E.	30—N.N.W.
16—S.	32—N.
	00—Calm.

399. Groups commencing with 399 specify a single direction.

Example :

- 39916—Wind from South.
 39999 specifies a variable direction.

Other groups commencing with 3 specify a range of directions.

Example :

- 31624—Wind from between S. and W.

Initial Figure 4.

WIND FORCE.

All groups commencing with figure 4 refer to wind force near the surface. Wind force is specified on the Beaufort Scale.

00—Calm.	
01—Light air	1-3 m.p.h.
02—Slight breeze	4-7 m.p.h.
03—Gentle breeze	8-12 m.p.h.
04—Moderate wind	13-18 m.p.h.
05—Fresh wind	19-24 m.p.h.
06—Strong wind	25-31 m.p.h.
07—High wind	32-38 m.p.h.
08—Gale	39-46 m.p.h.
09—Strong gale	47-54 m.p.h.
10—Whole gale	55-63 m.p.h.
11—Storm	64-75 m.p.h.
12—Hurricane	Above 75 m.p.h.

499. Groups commencing with 499 specify a single force.

Example :

- 49905—Fresh wind (about 19-24 m.p.h.).

Other groups commencing with 4 specify a range of forces.

Example :

- 40405—Moderate or fresh wind (Beaufort 4 and 5).

Initial Figures 59.

CHANGES OF WIND.

All groups commencing with figures 59 refer to changes of wind. The last three figures of such groups specify respectively :—

Third Figure—Changes of direction.

Fourth Figure—Changes of force.

Fifth Figure—Character of wind, or precise change of force according to the scheme :—

Third Figure.

Changes of Direction.

- 0 No change.
- 1 Veering.
- 2 Veering about 4 points.
- 3 Veering about 8 points.
- 4 Veering 12 or 16 points.
- 5 Backing.
- 6 Backing about 4 points.
- 7 Backing about 8 points.
- 8 Backing 12 or 16 points.

Fourth Figure.

Changes of Force.

- 0 No change.
- 1 Increasing.
- 2 Increasing gradually.
- 3 Increasing temporarily.
- 4 Increasing considerably.
- 5 Decreasing.
- 6 Decreasing gradually.
- 7 Decreasing temporarily.
- 8 Decreasing considerably.

Fifth Figure.

Character of wind or force to which change will lead.

- 0 No specification.
- 1 Squally.
- 2 With heavy squalls.
- 3 Calm or light.
- 4 Moderate.
- 5 Fresh.
- 6 Strong.
- 7 High.
- 8 Gale.
- 9 Force 9 or above.

Example :

25355 59518—Wind backing and increasing to a gale this afternoon in S.W. England.

Initial Figure 5.

UPPER WIND DIRECTION AND VELOCITY.

All groups commencing with figures 50 to 53 (inclusive) specify wind direction on scale 1 to 36 (second and third figures) and wind velocity in miles per hour (last two figures). The wind is for the height specified by the following group beginning with 6, unless no such height group follows, in which case it is for a height of about 2,000 feet.

Examples :

(1) 51623—Wind from 160° velocity 23 m.p.h., at 2,000 feet (direction in degrees is obtained by multiplying the code number by 10, e.g., $16 \times 10 = 160^\circ$ in the example given, the wind therefore being from a point 160° clockwise from due North, i.e., from nearly S.S.E.).

(2) 52035 60510—Wind 35 m.p.h. from 200° between heights of 5,000 and 10,000 feet.

Initial Figure 6.

HEIGHT GROUP.

All groups commencing with 6 refer to height above sea level.

66. Groups commencing with 66 give height in hundreds of feet.

Examples :

66025—2,500 feet.

66130—13,000 feet.

Other groups commencing with 6 give a range of heights in thousands of feet, the lower height being always given first.

Examples :

60105—Between 1,000 and 5,000 feet.

60714—Between 7,000 and 14,000 feet.

Initial Figure 7.

TEMPERATURE.

All groups commencing with figure 7 refer to temperature.

70000 Temperature falling slightly.

70101 Temperature falling.

70202 Temperature falling decidedly.

70303 Temperature falling slowly.

70404 Temperature falling rapidly.

70505 Temperature falling about 5°.

70606 Temperature falling about 10°.

70707 Temperature falling to-morrow.

70808 Warm at first, temperature falling later.

72020 Temperature rising slightly.

72121 Temperature rising.

72222 Temperature rising decidedly.

72323 Temperature rising slowly.

72424 Temperature rising rapidly.

72525 Temperature rising about 5°.

72626 Temperature rising about 10°.

72727 Temperature rising to-morrow.

72828 Cold at first, temperature rising later.

74040 Temperature about normal.

74141 Moderate temperature.

74242 Little change of temperature.

74343 Temperature nearly the same day and night.

74444 Temperature very uniform.

75050 Temperature below normal.

75151 Rather cool.

75252 Rather cold.

75353 Cold night, warm day.

75454 Very cold.

- 75555 Spell of cold weather anticipated.
- 75656 Cold at night with ground frost locally, warm by day.
- 75757 Cool, ground frost locally.
- 75858 Risk of ground frost at night.
- 75959 Frost at night, temperature moderate during the day.
- 76060 Frost inland at night.
- 76161 Keen frost.
- 76262 Sharp frost at night.
- 76363 Frost day and night.
- 76464 Spell of frost anticipated.
- 76565 Indications of break up of frost.
- 76666 Slight thaw.
- 76767 Partial thaw.
- 76868 General thaw.
- 77070 Temperature above normal.
- 77171 Rather warm.
- 77272 Rather hot.
- 77373 Very warm.
- 77474 Spell of mild weather anticipated.
- 77575 Hot day.

Initial Figure 8.

MIST, FOG AND VISIBILITY.

All groups commencing with figure 8 refer to mist, fog, or visibility. The last four figures of the group specify respectively :—

Second Figure—Intensity of obscurity or degree of visibility.

Third Figure—Locality of occurrence.

Fourth Figure—Time of occurrence.

Fifth Figure —Changes in intensity.

according to the following scheme :—

Second Figure.

Intensity.

- 0 Dense fog (objects not visible at 50 yards).
- 1 Thick fog (objects visible at 50 but not at 200 yards).
- 2 Fog (objects visible at 200 but not at 500 yards).
- 3 Moderate fog (objects visible at 500 but not at 1,000 yards).
- 4 Mist or thick haze (objects visible at 1,000 but not at 2,000 yards).
- 5 Mist or haze (objects visible at 2,000 yards but not at 4,000 yards).

- 6 Slight mist or haze (objects visible at 4,000 yards but not at 4 miles).
- 7 Slight haze (objects visible at 4 miles but not at 7 miles).
- 8 Moderately good visibility (objects visible at 7 but not at 20 miles).
- 9 Good or very good visibility (objects visible at above 20 miles).

*Third Figure.**Locality.*

- 0 No specification.
- 1 Inland.
- 2 On the coast.
- 3 At sea.
- 4 On coast and at sea.
- 5 Locally (patchy).
- 6 On the hills.
- 7 In the valleys.
- 8 In the town.
- 9 Near the ground.

*Fourth Figure.**Time of Occurrence.*

- 0 No specification.
- 1 Intermittent, occasional, at times.
- 2 Persistent, or continuous.
- 3 In morning.
- 4 In afternoon.
- 5 In evening.
- 6 Morning and evening.
- 7 In the day.
- 8 At night.
- 9 Later.

*Fifth Figure.**Changes in Intensity.*

- 0 No specification.
- 1 No change anticipated.
- 2 Visibility improving 1 or 2 points.
- 3 Visibility improving 2 or 3 points.
- 4 Visibility becoming fair or good.
- 5 Clearing during the day.
- 6 Visibility deteriorating 1 or 2 points.
- 7 Visibility deteriorating 2 or 3 points.
- 8 Visibility becoming bad.
- 9 Becoming misty or foggy at night.

Example :

80920, 89600—Continuous dense fog in the valleys, good or very good visibility on the hills.

Initial Figures 90.

CLOUDINESS.

All groups commencing with 90 refer to cloudiness. The last three figures of such groups specify respectively :—

Third Figure—Amount of cloud (Weather without reference to precipitation),

Fourth Figure—Height of base of lowest cloud,

Fifth Figure—Changes in cloud amount, according to the following scheme :—

Third Figure.

Cloud Amount or Weather.

- 0 Cloudless.
- 1 Fine (cloudless or slight cloud).
- 2 Fair (about half covered).
- 3 Cloudy (more than half covered).
- 4 Mainly overcast.
- 5 Completely overcast.
- 6 Alternating cloudless and overcast periods.
- 7 Cloudless in some places, overcast in others.

Fourth Figure.

Height of base of lowest cloud.

- 0 Base of cloud below 1,000 feet.
- 1 " " 0—300 "
- 2 " " 300—600 "
- 3 " " 600—1,000 "
- 4 " " 1,000—2,000 "
- 5 " " 2,000—3,000 "
- 6 " " 3,000—5,000 "
- 7 " " 5,000—6,500 "
- 8 " " 6,500—8,000 "
- 9 " " No low cloud.

Fifth Figure.

Changes in Amount.

- 0 No specification.
- 1 Cloud increasing.
- 2 Cloud decreasing.
- 3 No conspicuous change.
- 4 Cloud developing by day, clearing at night (diurnal range).
- 5 Cloud decreasing in late afternoon.
- 6 Varying irregularly.
- 7 At first.
- 8 Later.

Example :

90097, 90598—Cloudless at first, sky becoming entirely covered by high cloud later.

Initial Figures 91.

PRECIPITATION.

All groups commencing with figures 91 refer to precipitation. The last three figures of such groups specify respectively :—

Third Figure—The form of precipitation.

Fourth Figure—The manner of its fall.

Fifth Figure—Time and Place.

according to the scheme :—

<i>Third Figure.</i>	<i>Fourth Figure.</i>
<i>Form.</i>	<i>Character.</i>
0 Precipitation.	0 Slight occasional.
1 Rain or sleet, perhaps snow.	1 Slight continuous.
2 Rain or sleet.	2 Passing showers.
3 Sleet or snow.	3 Heavy passing showers.
4 Drizzle.	4 Moderate occasional.
5 Rain.	5 Moderate continuous.
6 Snow (or snow and hail).	6 Light.
7 Sleet or rain and snow.	7 Heavy.
8 Hail or rain and hail.	8 Heavy occasional.
9 Thunderstorms.	9 No specification.

*Fifth Figure.**Distribution Time and Changes.*

- 0 Local.
- 1 General.
- 2 Frequent.
- 3 At First.
- 4 Later.
- 5 This afternoon.
- 6 To-morrow.
- 7 Decreasing in intensity.
- 8 Increasing in intensity.
- 9 No specification.

Examples :

90430, 91503—Overcast, base of cloud between 600 and 1,000 feet, occasional slight rain at first.

90097, 90358, 91974—Fine at first, cloudy, with cloud base between 2,000 and 3,000 feet and heavy thunderstorms later.

Initial Figures 92.

BAROMETRIC CHANGES.

All groups commencing with figures 92 refer to barometric change in the past three hours. The last three figures of such groups specify respectively :—

Third Figure —Characteristic of changes.

Fourth Figure—Intensity of rise or fall.

Fifth Figure —Region in which important changes are occurring, according to the scheme :—

Third Figure.
Characteristic.

0	Steady or rising.	} No change or risen in past three hours.
1	Rising, then steady.	
2	Rising, then falling.	
3	Falling or steady, then rising.	
4	Unsteady, but rising.	} Fallen in past three hours.
5	Falling.	
6	Falling, then steady.	
7	Falling, then rising.	
8	Steady or rising, then falling.	
9	Unsteady, then falling.	

Fourth Figure.
Intensity of Change.

0	Steady (tendency 0 or 1).	5	Rapid (tendency 12-10).
1	Slight (tendency 2 or 3).	6	Very rapid (tendency 13-16).
2	Moderate (tendency 4 or 5).	7	Very rapid (tendency 17-25).
3	Brisk (tendency 6 or 7).	8	Exceptional (tendency above 25).
4	Rapid (tendency 8 or 9).	9	No specification.

Fifth Figure.
Region.

- 0 Position given by latitude and longitude.*
- 1 Shetlands.
- 2 Hebrides.
- 3 West Coast of Ireland.
- 4 Scilly.
- 5 East Coast of England.
- 6 Scandinavia.
- 7 Bay of Biscay.
- 8 Iceland.
- 9 Generally.

Examples :

92833—Brisk fall of the barometer has commenced off the west coast of Ireland.

92642—Rapid fall of the barometer in the Hebrides has checked, now nearly steady.

* The position is given by the group or groups beginning with "0" preceding this barometric group. If these give a definite latitude and longitude the barometric group applies roughly to the area within a radius of 100 miles of the specified position in the case of a falling barometer.

Specimen Message, showing method of dealing with check groups :

Group 999, England and Southern Scotland, taken collectively (appended to the "General Inference" issued at 2000 G.M.T.).

09218	Baltic	16508	20042	19299	22457	22455
32024	40405	52427	90447	91501	90358	91521
91990	87000	86500	22463	32024	40304	52628
90346	91501	91521	91090	87000	86500	00800
81304	65885	97113	26885	95—	70639	

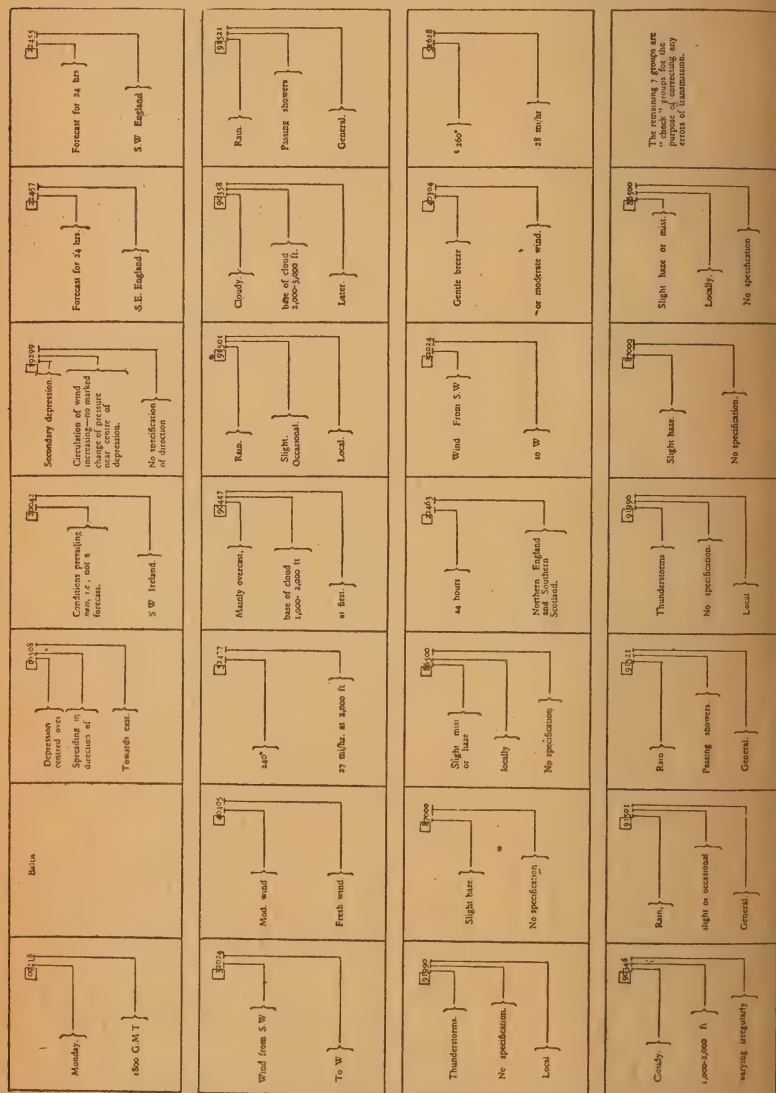


Fig. G, DECODE OF SPECIMEN MESSAGE.

CHECK GROUPS.

The following rules enable the check groups to be separated from the forecast groups on receipt of any message:—

When the total number of groups received does not exceed 6 the last 2 are check groups.
 " " " " " exceeds 6 but not 12 the last 3 are check groups.
 " " " " " exceeds 12 but not 18 the last 4 are check groups.
 " " " " " exceeds 18 but not 24 the last 5 are check groups.

The "check" groups are obtained by writing down in vertical columns the preceding groups:

(a)			(a)	
09218	0	First group of check figures.	86500	9
16508	0		22463	7
20042	8		32024	1
19299	0		40304	1
22457	0	Second group of check figures.	52628	3
22455	8		90346	2
32024	1		91501	6
40405	3		91521	8
52427	0	Third group of check figures.	91990	8
90447	4		87000	5
91501	6		86500	9
90358	5			
91521	8	(b) 70639 (5)		
91990	8			
87000	5	Seventh group of check figures.		

The figures comprising the first six check groups, are obtained by adding the horizontal columns and writing down the terminal figure of the sum thus obtained (i.e., $0+9+2+1+8=20$; check figure=0).

Similarly the seventh group is the terminal figures of each vertical column. The figure (5) of the sixth group is the "Key" figure. It is the terminal figure of the vertical column (a) of check figures and it must agree with the terminal figure obtained by adding the horizontal row (b). The key figure serves as a "check" on the check figures.

Now suppose an error of transmission (or reception) occurs in the group 19299 and instead of this, 19499 is received. The error is first detected on adding the horizontal columns, the check figure 2 not agreeing with that transmitted in the check group. Any one or more of the figures 1, 9, 4, 9, 9, might be wrong, but the error can usually be placed by adding the vertical columns and noting the disagreement with the figures of the seventh check group.

COMPLETE DECODE OF ABOVE MESSAGE.

Weather report based on observations on Monday at 6 p.m. (18h. G.M.T.). Depression over the Baltic spreading East. Secondary depression off South-West Ireland. Forecast for 24 hours for Southern England—wind between S.W. and W., moderate or fresh, 27 m.p.h. at 2,000 feet from 240° . Mainly overcast at first with lowest cloud at a height of 1,000-2,000 feet, slight occasional rain, cloudy (cloud 2,000-3,000 feet) with passing showers later perhaps thunderstorms. Visibility good but slight local haze. Forecast for 24 hours for North England and South Scotland, wind between S.W. and W., light or moderate, 28 m.p.h. from 260° at 2,000 feet. Cloudy (lowest cloud 1,000-2,000 feet) varying irregularly in amount, slight occasional local rain or passing showers perhaps thunderstorms. Visibility good but slight local haze.

SPECIFICATION OF THE BEAUFORT SCALE WITH

Beaufort Number.	Admiral Beaufort's General Description of Wind.	Admiral Beaufort's Specification, 1805.	Description of Wind.	Mode of Estimating aboard Sailing Vessels.	
0	Calm	Calm	—	—	
1	Light air ..	Just sufficient to give steerage way.	Light breeze	Sufficient wind for working ship.	
2	Slight breeze	That in which a well-conditioned man-of-war, with all sail set and "clean full," would go in smooth water from			1 to 2 knots.
3	Gentle breeze					3 to 4 knots.
4	Moderate breeze	That to which she could just carry in chase "full and by."	5 to 6 knots.	Moderate breeze	Forces most advantageous for sailing with leading wind and all sail drawing.
5	Fresh breeze		Royals, etc.		
6	Strong breeze		Single-reefed topsails or top-gallant sails.		
7	Moderate gale (High Wind)	Double-reefed topsails, jib, etc.	Strong wind	Reduction of sail necessary with leading wind.	
8	Fresh gale .. (Gale)	Triple-reefed topsails, etc.			
9	Strong gale ..	Close-reefed topsails and courses.	Gale forces	Considerable reduction of sail necessary even with wind quartering.	
10	Whole gale ..	That with which she could scarcely bear close-reefed main topsail and reefed foresail.			
11	Storm ..	That which would reduce her to storm stay sails.	Storm forces	Close reefed sail running, or hove to under storm sail.	
12	Hurricane ..	That which no canvas could withstand.			Hurricane ..	No sail can stand even when running.

* It has been decided that for statistical purposes winds of force less than 8 shall not be counted as gales, and to avoid the ambiguity implied by the use of the term "moderate gale" for force 7 the Beaufort description has been modified by the substitution of the descriptions in italics for forces 7 and 8.

EQUIVALENTS OF THE NUMBERS OF THE SCALE.

Beaufort Number.	Specification of Beaufort Scale.		Mean wind force in lb. per sq. ft. at standard density.	Equivalent velocity in miles per hour.	Limits of Velocity. Miles per hour.
	For Coast Use.	For Use on Land.			
0	Calm	Calm; smoke rises vertically.	0	0	Less than 1
1	Fishing smack* just has steerage way.	Direction of wind shown by smoke drift, but not by wind vanes.	·01	2	1-3
2	Wind fills the sails of smacks, which then move at about 1-2 miles per hour.	Wind felt on face; leaves rustle; ordinary vane moved by wind.	·08	5	4-7
3	Smacks begin to careen, and travel about 3-4 miles per hour.	Leaves and small twigs in constant motion; wind extends light flag.	·28	10	8-12
4	Good working breeze; smacks carry all canvas, with good list.	Raises dust and loose paper; small branches are moved.	·67	15	13-18
5	Smacks shorten sail ..	Small trees in leaf begin to sway; crested wavelets form on inland waters.	1·31	21	19-24
6	Smacks have double reef in main sail. Care required when fishing.	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	2·3	27	25-31
7	Smacks remain in harbour, and those at sea lie to.	Whole trees in motion; inconvenience felt when walking against wind.	3·6	35	32-38
8	All smacks make for harbour, if near.	Breaks twigs off trees; generally impedes progress.	5·4	42	39-46
9	—	Slight structural damage occurs (chimney pots and slates removed).	7·7	50	47-54
10	—	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	10·5	59	55-63
11	—	Very rarely experienced; accompanied by widespread damage.	14·0	68	64-75
12	—	—	Above 17·0	Above 75	Above 75

* The fishing smack in this column may be taken as representing a trawler of average type and trim. For larger or smaller boats and for special circumstances allowance must be made.

The following table enables inches of mercury to be put into millibars and *vice versa* :—

TABLE I.—PRESSURE.
Equivalents in Millibars of Inches of Mercury at 32° F. Lat. 45°.

Inches. and Tenths.	Hundredths of an inch.									
	0	1	2	3	4	5	6	7	8	9
	Millibars.									
27.0	914.3	914.6	915.0	915.3	915.7	916.0	916.3	916.7	917.0	917.4
27.1	917.7	918.0	918.4	918.7	919.0	919.4	919.7	920.1	920.4	920.7
27.2	921.1	921.4	921.8	922.1	922.4	922.8	923.1	923.4	923.8	924.1
27.3	924.5	924.8	925.1	925.5	925.8	926.2	926.5	926.8	927.2	927.5
27.4	927.9	928.2	928.5	928.9	929.2	929.5	929.9	930.2	930.6	930.9
27.5	931.2	931.6	931.9	932.3	932.6	932.9	933.3	933.6	933.9	934.3
27.6	934.6	935.0	935.3	935.6	936.0	936.3	936.7	937.0	937.3	937.7
27.7	938.0	938.3	938.7	939.0	939.4	939.7	940.0	940.4	940.7	941.1
27.8	941.4	941.7	942.1	942.4	942.8	943.1	943.4	943.8	944.1	944.4
27.9	944.8	945.1	945.5	945.8	946.1	946.5	946.8	947.2	947.5	947.8
28.0	948.2	948.5	948.8	949.2	949.5	949.9	950.2	950.5	950.9	951.2
28.1	951.6	951.9	952.2	952.6	952.9	953.2	953.6	953.9	954.3	954.6
28.2	954.9	955.3	955.6	956.0	956.3	956.6	957.0	957.3	957.7	958.0
28.3	958.3	958.7	959.0	959.3	959.7	960.0	960.4	960.7	961.0	961.4
28.4	961.7	962.1	962.4	962.7	963.1	963.4	963.7	964.1	964.4	964.8
28.5	965.1	965.4	965.8	966.1	966.5	966.8	967.1	967.5	967.8	968.1
28.6	968.5	968.8	969.2	969.5	969.8	970.2	970.5	970.9	971.2	971.5
28.7	971.9	972.2	972.6	972.9	973.2	973.6	973.9	974.2	974.6	974.9
28.8	975.3	975.6	975.9	976.3	976.6	977.0	977.3	977.6	978.0	978.3
28.9	978.6	979.0	979.3	979.7	980.0	980.3	980.7	981.0	981.4	981.7
29.0	982.0	982.4	982.7	983.0	983.4	983.7	984.1	984.4	984.7	985.1
29.1	985.4	985.8	986.1	986.4	986.8	987.1	987.5	987.8	988.1	988.5
29.2	988.8	989.1	989.5	989.8	990.2	990.5	990.8	991.2	991.5	991.9
29.3	992.2	992.5	992.9	993.2	993.5	993.9	994.2	994.6	994.9	995.2
29.4	995.6	995.9	996.3	996.6	996.9	997.3	997.6	997.9	998.3	998.6
29.5	999.0	999.3	999.6	1000.0	1000.3	1000.7	1001.0	1001.3	1001.7	1002.0
29.6	1002.4	1002.7	1003.0	1003.4	1003.7	1004.0	1004.4	1004.7	1005.1	1005.4
29.7	1005.7	1006.1	1006.4	1006.8	1007.1	1007.4	1007.8	1008.1	1008.4	1008.8
29.8	1009.1	1009.5	1009.8	1010.1	1010.5	1010.8	1011.2	1011.5	1011.8	1012.2
29.9	1012.5	1012.8	1013.2	1013.5	1013.9	1014.2	1014.5	1014.9	1015.2	1015.6
30.0	1015.9	1016.2	1016.6	1016.9	1017.3	1017.6	1017.9	1018.3	1018.6	1018.9
30.1	1019.3	1019.6	1020.0	1020.3	1020.6	1021.0	1021.3	1021.7	1022.0	1022.3
30.2	1022.7	1023.0	1023.3	1023.7	1024.0	1024.4	1024.7	1025.0	1025.4	1025.7
30.3	1026.1	1026.4	1026.7	1027.1	1027.4	1027.7	1028.1	1028.4	1028.8	1029.1
30.4	1029.4	1029.8	1030.1	1030.5	1030.8	1031.1	1031.5	1031.8	1032.2	1032.5
30.5	1032.8	1033.2	1033.5	1033.8	1034.2	1034.5	1034.9	1035.2	1035.5	1035.9
30.6	1036.2	1036.6	1036.9	1037.2	1037.6	1037.9	1038.2	1038.6	1038.9	1039.3
30.7	1039.6	1039.9	1040.3	1040.6	1041.0	1041.3	1041.6	1042.0	1042.3	1042.6
30.8	1043.0	1043.3	1043.7	1044.0	1044.3	1044.7	1045.0	1045.4	1045.7	1046.0
30.9	1046.4	1046.7	1047.1	1047.4	1047.7	1048.1	1048.4	1048.7	1049.1	1049.4
31.0	1049.8	1050.1	1050.4	1050.8	1051.1	1051.5	1051.8	1052.1	1052.5	1052.8
31.1	1053.1	1053.5	1053.8	1054.2	1054.5	1054.8	1055.2	1055.5	1055.9	1056.2
31.2	1056.5	1056.9	1057.2	1057.5	1057.9	1058.2	1058.6	1058.9	1059.2	1059.6
31.3	1059.9	1060.3	1060.6	1060.9	1061.3	1061.6	1062.0	1062.3	1062.6	1063.0
31.4	1063.3	1063.6	1064.0	1064.3	1064.7	1065.0	1065.3	1065.7	1066.0	1066.4
Thousandths of an Inch.										
Inch	.001	.002	.003	.004	.005	.006	.007	.008	.009	
Millibars.	.0	.1	.1	.1	.2	.2	.2	.3	.3	

1000 millibars = 1 bar = 29.5306 mercury-inches = 750.076 mercury millimetres (using
1 inch = 2.54000 cm.)

TABLE II.—TABLE OF CORRECTIONS FOR REDUCING BAROMETRIC HEIGHTS TO 0° C. AND TO SEA LEVEL.

NOTE.—The barometric reading should first be corrected for index error. This error may be neglected if it is less than 0.3 mm. The + sign indicates that the correction is to be added to the barometric ruling. The - sign indicates that the correction is to be subtracted.

Temperature by the thermometer attached to the barometer		- 4° C. 24.8° F.	- 2° C. 28.4° F.	0° C. 32° F.	+ 2° C. 35.6° F.	+ 4° C. 39.2° F.	6° C. 42.8° F.	8° C. 46.4° F.	10° C. 50° F.	12° C. 53.6° F.	14° C. 57.2° F.	16° C. 60.8° F.	18° C. 64.4° F.	20° C. 68° F.	22° C. 71.6° F.	24° C. 75.2° F.	26° C. 78.8° F.	28° C. 82.4° F.
Corrections to be made.																		
M'tres.	Ft. In.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
0	0 0	+0.5	+0.3	0.0	-0.2	-0.5	-0.7	-1.0	-1.2	-1.5	-1.7	-2.0	-2.2	-2.5	-2.7	-3.0	-3.2	-3.5
1	3 3	+0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1	3.4
2	6 7	+0.8	0.5	0.3	0.0	0.3	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0	3.2
3	9 10	+0.9	0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1
4	13 1	+1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0
5	16 5	+1.2	0.9	0.7	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.7	2.9
6	19 8	+1.3	1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.6	2.8
7	22 0	+1.4	1.2	0.9	0.6	0.3	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.2	2.4	2.7
8	26 3	+1.5	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.1	2.3	2.6
9	29 6	+1.7	1.4	1.2	0.8	0.6	0.3	+0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.6	2.0	2.2	2.5
10	32 10	+1.8	1.6	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.9	2.1	2.4
11	36 1	+1.9	1.7	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.4	1.8	2.0	2.2
12	39 4	+2.0	1.8	1.5	1.2	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1
13	42 8	+2.2	1.9	1.7	1.3	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.5	1.8	2.0
14	45 11	+2.3	2.0	1.8	1.5	1.2	0.9	0.7	0.4	0.2	0.0	0.3	0.6	0.8	1.1	1.4	1.6	1.9
15	49 3	+2.4	2.2	1.9	1.6	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.5	0.7	1.0	1.3	1.5	1.8
16	52 6	+2.5	2.3	2.0	1.7	1.5	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4	1.6
17	55 9	+2.6	2.4	2.1	1.9	1.6	1.3	1.1	0.8	0.6	0.3	+0.1	0.3	0.5	0.8	1.0	1.3	1.5
18	59 1	+2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4
19	62 4	+2.9	2.6	2.4	2.1	1.9	1.5	1.3	1.0	0.8	0.6	0.3	0.0	0.3	0.5	0.8	1.0	1.3
20	65 7	+3.0	2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	+0.1	0.2	0.4	0.7	0.9	1.2
21	68 11	+3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.5	0.2	0.1	0.3	0.6	0.8	1.1
22	72 2	+3.3	3.0	2.8	2.5	2.2	1.9	1.7	1.4	1.2	0.9	0.6	0.3	+0.1	0.2	0.4	0.7	0.9
23	75 6	+3.4	3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.4	0.2	0.1	0.3	0.6	0.8

Height of barometer cistern above sea level.

Height of barometer cistern above sea level.

TABLE III.—CORRECTIONS FOR REDUCING THE BAROMETER READINGS FOR GRAVITY AT LATITUDE 45°.

For Latitudes 0° to 44° N. or S. the correction is to be *subtracted*." 46° to 90° N. or S. " " *added*.

Latitude.		HEIGHT OF THE BAROMETER IN INCHES.								
		27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0
°	°	In.	In.	In.	In.	In.	In.	In.	In.	In.
45	45	.000	.000	.000	.000	.000	.000	.000	.000	.000
44	46	.002	.002	.003	.003	.003	.003	.003	.003	.003
43	47	.005	.005	.005	.005	.005	.005	.005	.006	.006
42	48	.007	.007	.008	.008	.008	.008	.008	.008	.008
41	49	.010	.010	.010	.010	.010	.011	.011	.011	.011
40	50	.012	.012	.013	.013	.013	.013	.013	.014	.014
39	51	.015	.015	.015	.015	.016	.016	.016	.016	.017
38	52	.017	.017	.018	.018	.018	.018	.019	.019	.019
37	53	.019	.020	.020	.020	.021	.021	.021	.022	.022
36	54	.022	.022	.022	.023	.023	.024	.024	.024	.025
35	55	.024	.024	.025	.025	.026	.026	.027	.027	.027
34	56	.026	.027	.027	.028	.028	.029	.029	.030	.030
33	57	.028	.029	.029	.030	.031	.031	.032	.032	.033
32	58	.031	.031	.032	.032	.033	.033	.034	.035	.035
31	59	.033	.033	.034	.035	.035	.036	.036	.037	.038
30	60	.035	.036	.036	.037	.038	.038	.039	.039	.040
29	61	.037	.038	.038	.039	.040	.040	.041	.042	.043
28	62	.039	.040	.041	.041	.042	.043	.043	.044	.045
27	63	.041	.042	.043	.043	.044	.045	.046	.046	.047
26	64	.043	.044	.045	.045	.046	.047	.048	.049	.049
25	65	.045	.046	.047	.047	.048	.049	.050	.051	.052
24	66	.047	.048	.049	.049	.050	.051	.052	.053	.054
23	67	.049	.049	.050	.051	.052	.053	.054	.055	.056
22	68	.050	.051	.052	.053	.054	.055	.056	.057	.058
21	69	.052	.053	.054	.055	.056	.057	.058	.059	.060
20	70	.054	.055	.056	.057	.058	.059	.060	.061	.062
19	71	.055	.056	.057	.058	.059	.060	.061	.062	.063
18	72	.057	.058	.059	.060	.061	.062	.063	.064	.065
17	73	.058	.059	.060	.061	.062	.063	.064	.065	.067
16	74	.059	.060	.061	.063	.064	.065	.066	.067	.068
15	75	.061	.062	.063	.064	.065	.066	.067	.068	.070
14	76	.062	.063	.064	.065	.066	.067	.069	.070	.071
13	77	.063	.064	.065	.066	.068	.069	.070	.071	.072
12	78	.064	.065	.066	.067	.069	.070	.071	.072	.073
11	79	.065	.066	.067	.068	.070	.071	.072	.073	.074
10	80	.066	.067	.068	.069	.071	.072	.073	.074	.075
9	81	.067	.068	.069	.070	.071	.073	.074	.075	.076
8	82	.067	.068	.070	.071	.072	.073	.075	.076	.077
7	83	.068	.069	.070	.072	.073	.074	.075	.077	.078
6	84	.068	.070	.071	.072	.073	.075	.076	.077	.079
5	85	.069	.070	.071	.073	.074	.075	.077	.078	.079
4	86	.069	.071	.072	.073	.074	.076	.077	.078	.080
3	87	.070	.071	.072	.073	.075	.076	.077	.079	.080
2	88	.070	.071	.072	.074	.075	.076	.078	.079	.080
1	89	.070	.071	.072	.074	.075	.076	.078	.079	.080
0	90	.070	.071	.073	.074	.075	.076	.078	.079	.080

TABLE IV.

Relation between inches and millimetres for comparison of readings of barometers graduated in these units.

In.	Mm.	In.	Mm.	In.	Mm.	In.	Mm.
27.0	685.8	28.0	711.2	29.0	736.6	30.0	762.0
27.2	690.9	28.2	716.3	29.2	741.7	30.2	767.1
27.4	696.0	28.4	721.4	29.4	746.8	30.4	772.2
27.6	701.0	28.6	726.4	29.6	751.8	30.6	777.2
27.8	706.1	28.8	731.5	29.8	756.9	30.8	782.3

NOTE.—(1) The table is based on the legal relation 1 in. = 2.5400 cm., which agrees very closely indeed with the best experimental comparisons.

(2) As millimetre barometers have the same standard temperature 0° C. for the brass scale and for the mercury, while inch barometers have a standard 32° F. for the mercury and 60° F. for the brass scale, the readings require correction for temperature by appropriate tables before the comparison can be made.

TABLE V.

TABLE FOR CONVERSION OF DEGREES FAHRENHEIT INTO DEGREES CENTIGRADE AND DEGREES ABSOLUTE.

°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.
20	-6.7	266.3	45	7.2	280.2	70	21.1	294.1	95	35.0	308.0
21	-6.1	266.9	46	7.8	280.8	71	21.7	294.7	96	35.6	308.6
22	-5.6	267.4	47	8.3	281.3	72	22.2	295.2	97	36.1	309.1
23	-5.0	268.0	48	8.9	281.9	73	22.8	295.8	98	36.7	309.7
24	-4.4	268.6	49	9.4	282.4	74	23.3	296.3	99	37.2	310.2
25	-3.9	269.1	50	10.0	283.0	75	23.9	296.9	100	37.8	310.8
26	-3.3	269.7	51	10.6	283.6	76	24.4	297.4	101	38.3	311.3
27	-2.8	270.2	52	11.1	284.1	77	25.0	298.0	102	38.9	311.9
28	-2.2	270.8	53	11.7	284.7	78	25.6	298.6	103	39.4	312.4
29	-1.7	271.3	54	12.2	285.2	79	26.1	299.1	104	40.0	313.0
30	-1.1	271.9	55	12.8	285.8	80	26.7	299.7	105	40.6	313.6
31	-0.6	272.4	56	13.3	286.3	81	27.2	300.2	106	41.1	314.1
32	0.0	273.0	57	13.9	286.9	82	27.8	300.8	107	41.7	314.7
33	+0.6	273.6	58	14.4	287.4	83	28.3	301.3	108	42.2	315.2
34	1.1	274.1	59	15.0	288.0	84	28.9	301.9	109	42.8	315.8
35	1.7	274.7	60	15.6	288.6	85	29.4	302.4	110	43.3	316.3
36	2.2	275.2	61	16.1	289.1	86	30.0	303.0	111	43.9	316.9
37	2.8	275.8	62	16.7	289.7	87	30.6	303.6	112	44.4	317.4
38	3.3	276.3	63	17.2	290.2	88	31.1	304.1	113	45.0	318.0
39	3.9	276.9	64	17.8	290.8	89	31.7	304.7	114	45.6	318.6
40	4.4	277.4	65	18.3	291.3	90	32.2	305.2	115	46.1	319.1
41	5.0	278.0	66	18.9	291.9	91	32.8	305.8	116	46.7	319.7
42	5.6	278.6	67	19.4	292.4	92	33.3	306.3	117	47.2	320.2
43	6.1	279.1	68	20.0	293.0	93	33.9	306.9	118	47.8	320.8
44	6.7	279.7	69	20.6	293.6	94	34.4	307.4	119	48.3	321.3

TABLE VI.

WIND VELOCITY.

Conversion Table from Miles per Hour to Metres per Second.

1 mile per hour = 0.44704 metre per second.

Miles per Hour	0	1	2	3	4	5	6	7	8	9
	Metres per Second.									
0	0.0	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.6	4.0
10	4.5	4.9	5.4	5.8	6.3	6.7	7.2	7.6	8.0	8.5
20	8.9	9.4	9.8	10.3	10.7	11.2	11.6	12.1	12.5	13.0
30	13.4	13.9	14.3	14.8	15.2	15.6	16.1	16.5	17.0	17.4
40	17.9	18.3	18.8	19.2	19.7	20.1	20.6	21.0	21.5	21.9
50	22.4	22.8	23.2	23.7	24.1	24.6	25.0	25.5	25.9	26.4
60	26.8	27.3	27.7	28.2	28.6	29.1	29.5	30.0	30.4	30.8
70	31.3	31.7	32.2	32.6	33.1	33.5	34.0	34.4	34.9	35.3
80	35.8	36.2	36.7	37.1	37.6	38.0	38.4	38.9	39.3	39.8
90	40.2	40.7	41.1	41.6	42.0	42.5	42.9	43.4	43.8	44.3
100	44.7	45.2	45.6	46.0	46.5	46.9	47.4	47.8	48.3	48.7

TABLE VII.

RAINFALL TABLE FOR CONVERSION OF INCHES TO MILLIMETRES.

Ins.	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
	Millimetres.									
0.0	0.00	0.25	0.51	0.76	1.02	1.27	1.52	1.78	2.03	2.29
0.1	2.54	2.79	3.05	3.30	3.56	3.81	4.06	4.32	4.57	4.83
0.2	5.08	5.33	5.59	5.84	6.10	6.35	6.60	6.86	7.11	7.37
0.3	7.62	7.87	8.13	8.38	8.64	8.89	9.14	9.40	9.65	9.91
0.4	10.16	10.41	10.67	10.92	11.18	11.43	11.68	11.94	12.19	12.45
0.5	12.70	12.95	13.21	13.46	13.72	13.97	14.22	14.48	14.73	14.99
0.6	15.24	15.49	15.75	16.00	16.26	16.51	16.76	17.02	17.27	17.53
0.7	17.78	18.03	18.29	18.54	18.80	19.05	19.30	19.56	19.81	20.07
0.8	20.32	20.57	20.83	21.08	21.34	21.59	21.84	22.10	22.35	22.61
0.9	22.86	23.11	23.37	23.62	23.88	24.13	24.38	24.64	24.89	25.15
1.0	25.40	25.65	25.91	26.16	26.42	26.67	26.92	27.18	27.43	27.69
1.1	27.94	28.19	28.45	28.70	28.96	29.21	29.46	29.72	29.97	30.23
1.2	30.48	30.73	30.99	31.24	31.50	31.75	32.00	32.26	32.51	32.77
1.3	33.02	33.27	33.53	33.78	34.04	34.29	34.54	34.80	35.05	35.31
1.4	35.56	35.81	36.07	36.32	36.58	36.83	37.08	37.34	37.59	37.85
1.5	38.10	38.35	38.61	38.86	39.12	39.37	39.62	39.88	40.13	40.39
1.6	40.64	40.89	41.15	41.40	41.66	41.91	42.16	42.42	42.67	42.93
1.7	43.18	43.43	43.69	43.94	44.20	44.45	44.70	44.96	45.21	45.47
1.8	45.72	45.97	46.23	46.48	46.74	46.99	47.24	47.50	47.75	48.01
1.9	48.26	48.51	48.77	49.02	49.28	49.53	49.78	50.04	50.29	50.55
2.0	50.80	51.05	51.31	51.56	51.82	52.07	52.32	52.58	52.83	53.09

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
ALASKA Dutch Harbour, NPR, 2,250 sp...	0530 1730	—	S. S.	InIn BBBD F W'WAC	See U.S.A. special	Current barometric pressure, direc- tion and force of wind, and state of weather Issued by Dutch Harbor Weather Bureau. This information is also transmitted on request
ALGERIA Oran (Ain-el-Turck), FUK, 3,300 cw.	0300 0900 1400 1445 2000	0100 0700 — 1300 1800	S. S. U.W. S. S.	"Météo Oran" (21 only), BBBD FWTT bbb InIn BBBD FWTTV bbbRR MMmm InIn D ₁ V ₁ D ₂ V ₂ D ₃ V ₃ D ₄ V ₄ D ₅ V ₅ D ₆ V ₆ Repeat of 0845 message from Médouna When necessary, the direction of the cyclonic depression is transmitted <i>en clair</i> InIn BBBD FWTT bbb Repeat of 1430 and 1945 messages respectively from Médouna	O.I.C. O.I.C. (mbd.) Eiffel Tower — — — O.I.C. —	Synoptic Stations: 31 Oran (La Senia) 32 Algiers 33 Constantine V = horizontal visibility 0 = objects not visible at 50m. 1 = " " " " 100m. 2 = " " " " 500m. 3 = " " " " 1,000m. 4 = " " " " 2,000m. 5 = " " " " 4,000m. 6 = " " " " 10,000m. 7 = " " " " 20,000m. 8 = " " " " 50,000m. 9 = " " " " pressure in whole mm. BB = pressure in half-mm. b = bar tendency in half-mm. 0 = steady 0 or 1 mm. 1 = rising slowly 2 or 3 mm. 2 = rising 4 to 7 mm. 3 = rising rapidly 8 to 12 mm. 4 = rising very rapidly more than 12. 5 = falling slowly 2 or 3, etc., as 1, 2, 3, 4
ARABIA Adea, BZF, 2,000	0130 1330	—	S.W. S.W.	The message transmitted is a weather bulletin sent out from Simla and refers to the meteorological conditions in the eastern portion of the Arabian Sea, being prefixed by the words "East Arabian sea." When the weather is undisturbed the a.m. message will be a repetition of the p.m. message, while during unsettled weather the former may or may not be the same. <i>Example of message</i> :—"East Arabian sea squally weather near Laccadive Islands storm may be forming."	p.l.	

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
ARGENTINE Buenos Ayres (Darsena Norte) LIA, 1,000, sp.	1405 on request (free)	—	—	—	—	The bulletin is transmitted <i>en clair</i> in Spanish. It contains a weather forecast for the ensuing 24 hours for the Rio de la Plata only.
AUSTRALIAN COMMONWEALTH Perth, VIP Sydney, VIS	1300 1030 2230	—	—	—	p.l.	(1) Weather bulletins are sent when necessary or on request from ships
Melbourne, VIM Adelaide, VIA Brisbane, VIB Geraldton, VIN	1100 1130 1200 on request	S.F.W.		—	p.l.	(2) An official <i>ocean forecast</i> is transmitted daily from The Central Weather Bureau, Melbourne, to all radio stations in Australia, also Port Moresby (New Guinea), and it is preceded by a specific statement of the sea conditions existing at 9 a.m. around Australia and sea disturbances off any part of the coast. When weather conditions are severe, storm warnings are sent out by shore stations and vessels receiving the warnings are requested to communicate them to passing shipping by means of code flags
Broome, VIO Wyndham, VIW Darwin, VID Thursday Is. VII Cooktown, VIC Townsville, VIT Rockhampton, VIR Flinders Is., VIL Hobart (Tasmania), VIH Esperance, VIE (all 600 sp.)	" " " " " " " " " " "			—		
AUSTRIA Deutsch-Attenburg (Near Vienna) OHL, 5,600 cw. (3,500 sp.)	0820 1520	2000 0600 1300	S. S.	"Météo Wien" In In BBBDD FWITC BBDD FWITC BBRR Mmm In In BBBDD FWITC Stations: or Vienna, 02 Sonblick (3106 m.), 03 Feldkirch, 04 Innsbruck, 05 Salzburg, 06 Linz, 07 Grätz, 08 Klagenfurt, 09 Obir (2041 m). NOTE: In the case of high-altitude stations 02 and 09, barometric pressure is not reduced to sea level.	O.I.C.	First two groups refer to 2000 of previous day
BAHAMAS	—	—	—	No meteorological service exists	—	

1920
1520
1020

Example of Message:—Tous de Bruxelles—Tous de Bruxelles—
Météo douze heures—Météo twelve o'clock—Uccle—Nuageux,
pas de changement apparent—Cloudy, no apparent change—
Dix kilomètres—Ten kilometres—Six cents mètres—Six
hundred metres—St. Ingelvert—St. Ingelvert—Nuageux après
pluie—Cloudy, after rain—etc.

Haren (Air port. of
Brussels), OPVH,
1400 cw, (open 0700-
1900 or later)

Brussels, OPO, 1,680 cw.
(open 0600-2000)

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0824
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1124
1424
1524
1724
1824
2024
1324
1024

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"Avis pour aviation"
[0600] InIn (Vs) wwVhL NDDFW
[0700] InIn (Vs) BBBDD FwwTT cbWVH ALaNH RMMmr
"Pilot" (or) h₁ddvv h₂ddvv, etc.
[1000] InIn (Vs) BBBDD FwwTT cbWVH ALaNH CaddF₁S

N.I.C.
N.I.C.
N.I.C.

Synoptic.
Aviation meteors are sometimes
issued by Haren OPVH instead of by
Brussels OPO (Royal Meteorological
Institute)

Aviation—Synoptic
Stations: or Brussels, 02 Ostend.
Notes: (1) Reports from 02 are
only transmitted 2 or 3 times daily.
(2) Index group is preceded by
figure x, where x = units digit in
sum of figures wwVhL.
(3) Figures in square brackets are
different for different messages

BRAZIL
Ilha do Governador
(Rio de Janeiro),
SOH, 1,800

0000
(follows
T.S.)
1400
(follows
T.S.)

(Preceded by Time Signals)
(Station call letters) BBBDDFW S

Stations:—
MN = Manáos
BL = Belém
SL = S. Luiz
FT = Fortaleza
RF = Recife
BH = Bahia

VT = Victoria
CF = Cabo Frio
RJ = Rio Janeiro
SP = S. Paulo
ST = Santos
PG = Paranaguá

FP = Florianópolis
RG = Rio Grande
PA = Porto Alegre
CB = Corumbá
MV = Montevideo
AB = Buenos Ayres

BRITISH HONDURAS
Belize, VPP, 1,500
600 sp.

0000
1140
(When
neces-
sary)

Transmitted June to November
(inclusive) only

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
BRITISH INDIA						
Karachi, VWK	0130	—	—	—	—	The report sent out from Bombay and Karachi gives the weather conditions in the East Arabian Sea, while that broadcast from the other four stations refers to the Bay of Bengal. The same reports are broadcast from Aden Radio BZF on 2,000 m. at 0130 and 1330, and from Matara, Ceylon (BZE) on 2,000 m. at 0135 and 1335 by arrangement with the Admiralty
Bombay, VWB	1330	—	—	—	—	
Madras, VWM	1300	—	—	—	—	
Calcutta, VWC	0100	—	—	—	—	
(all 2,000)	1300	—	—	—	—	
Rangoon, VTR	0130	—	—	—	—	Should steamers require the local weather reports, they are given
(Burma)	1300	—	—	—	—	
Port Blair, VTP	0130	—	—	—	—	
(Andaman Is.)	1330	—	—	—	—	
(both 1,200)						
BRITISH WEST INDIES						
Barbados	—	—	—	—	—	
BULGARIA						
Sofia, FF, 3,500 sp. ..	0655	0530	S.	BBDD FWTTC bbbRR MMmm	O.I.C.	Weather forecasts issued by the Canadian Meteorological Service transmitted to any ship upon request
	1355	1230	S.	BBDD FWII bbb	O.I.C.	
CANADA (1)						
British Columbia						
Digby Is., VAI	*	—	F.	—	—	Weather forecasts issued by the Canadian Meteorological Service transmitted to any ship upon request
Dead Tree Point, VAH	"	—	"	—	—	
Bull Harbour, VAG	"	—	"	—	—	
Alert Bay, VAF	"	—	"	—	—	
Cape Lazo, VAC	"	—	"	—	—	
Estevan, VAE	"	—	"	—	—	
Point Grey, VAB	"	—	"	—	—	
Pachena, VAD	"	—	"	—	—	
Gonzalez, HHI	"	—	"	—	—	

Nova Scotia
VAL, 1,000

Cape Sable,	VCU	1330* 0200* 1400*	—	F.	(Issued by Canadian Meteorological Service, Toronto)	..	Continuous watch is kept from December to March, and from 1200 to 0000 G.M.T. from April to November. Open only during season of navigation
Camperdown,	VCS	—	—	—	—	..	do.
North Sydney,	VCO	—	—	—	—	..	do.
Sable Island,	VCT	—	—	—	—	..	do.
Cape Bear,	VCP	—	—	—	—	..	do.
Grindstone Is.,	VCN	—	—	—	—	..	do.
Fame Point,	VCG	0145* 1345*	—	F.	Compiled by Canadian Meteorological Service, Toronto	..	do.
Clarke City,	VCK	—	—	—	—	..	do.
Grosse Is.	VCD	—	—	—	—	..	do.
Montreal, (all 600 sp.)	VCA	—	—	—	—	..	do.
Great Lakes							
Kingsston,	VBH	0400*	—	—	—	..	These stations open only during the season of navigation.
Toronto,	VBG	0340*	—	—	—	..	—
Port Hurwell,	VBF	0400*	—	—	—	..	—
Point Edward,	VBE	0410*	—	—	—	..	—
Midland,	VBC	0400*	—	—	—	..	—
Sault St. Marie,	VBB	0420*	—	—	—	..	—
Port Arthur,	VBA	0430*	—	—	—	..	—
Tobermory, (all 600 sp.)	VBD	—	—	—	—	..	—
OREYON							
Matare, BZE, 2,000		0135 1335	—	S.W. S.W.	The daily weather bulletin consists of two portions: the first portion referring to the Bay of Bengal, sent out from Calcutta, and the second portion relating to the Arabian Sea, sent out from Simla. The first portion is prefixed by the word "Bay," and the second portion by the words "Arabian Sea." When the weather is undisturbed the a.m. message will be a repetition of the p.m. message, while during unsettled weather the former may or may not be the same	p.l.	—
Example:—"Bay moderate storm centre sixteen north ninety east moving north-west. Arabian, sea normal."							* signifies "on request."
CHILE							
Valparaiso, CCE, 1,000 (except Sundays and holidays)		0100 (follows) Time signal 1613	2043 1243	S.	"OMC" (Meteorological Office of Chile) (Station letter) BBDDF followed by a summary of the weather changes during the day	..	Synoptic. Stations: V = Valparaiso T = Talcahuano C = Corral J = Juan Fernandez M = Mocha G = Guafio R = Raper P = Punta Arenas O = Puerto-Montt Q = Coquimbo
As for 0100 message							
Notes:—(1) If the whole of the data from any station is missing, the word "No" is sent before the station letter							
(2) Other missing obs. replaced by "x"							
(3) If the weather is not good in the ports indicated in the bulletin, there will be added in the current language some of the words such as "storm," "rain," "mist," "sun," etc. (see notes)							

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G. V. T.	Time of ob. G. M. T.	Nature of report.	Form of Message.	Code used.	Notes.
CHILE (continued)			W.	Storm warnings are issued, when necessary, after the above messages		BB= bar pressure in mm. (7 omitted) DD= wind direction scale (1-8) I = N; 2 = NE; 3 = E, etc. F = wind force near the ground on Beaufort Scale. Forces above 8 sent in words, (diez (10), once (11), and doce (12)) When necessary the following words will be added: Temporal = gale Lluvia = rain Nebolina = fog Sol = sunny
CHINA Shanghai-Zikawei, FFZ, 600 sp.	0300 0900 (both following W.R.)	—	—	—	—	—
CUBA Guantanamo, NAW, 2,750	—	—	W.	Hurricane messages and advisory messages relating thereto are transmitted when issued by the Washington Weather Bureau and repeated every four hours	p.l.	—
CZECHO-SLOVAKIA Prague, PRG, 4,500 cw.	0930	0700	S.	"Météo Tchecoslovaque" (or) InIn BBBDD FwWTT cbWVH ALANh RRmmr cddVV ..	N.I.C.	Synoptic. 01 Prague 03 Eger 05 Cheb 06 Miesovka (840 m.) 23 Stara Dala 25 Koste 32 Olomouc 34 Nitra
	1330	1300	S.	(05 to 32) InIn BBBDD FwWTT cbWVH ALANh RRmmr "Sondages" (or, 05, 34) InIn hddvv hddvv, etc. .. (or) InIn BBBDD FwWTT cbWVH ALANh CddVV ..	N.I.C.	
	2030	1800	S.	(05-32) InIn BBBDD FwWTT cbWVH ALANh RRmmr (or) InIn BBBDD FwWTT cbWVH ALANh RRmmr CddVV .. (05-32) InIn BBBDD FwWTT cbWVH ALANh RRmmr	N.I.C.	
DANZIG FREE STATE Danzig, DG, 1,950 ..	0735 1335 1835	0700 1300 1800	— — W	BBDD FwTTP cbRR MMmmW BBDD FwTW ² cbbPA ³ .. BBDD FwTW ¹ cbb .. <small>from weather</small>	— — —	Station: Stato Ob., Danzig Weather reports are supplied to ships upon request subject to pay- ment of appropriate station fee.

1335	5,000 cw.	When necessary immediately after W.R.	—	W.	—	<p>Notre : (1) Ob, omitted from one message are transmitted at the beginning of the next and the time of ob. is indicated by adding hour of ob. to index number of the station "Tempête"</p> <p>Storm warnings are transmitted as soon as received and every four hours afterwards, except at 0400</p>	<p>These reports are prepared by the Aviation Service U.S.M.C., twice daily</p>	<p>01 Constantinople 03 Haushoum 04 Blaavands Huk 05 Hammeren</p>
				S. W.	—	<p>InIn PPR BBDD FWWT cbWVH h₂ddvv, etc. . .</p> <p>Notre : (1) PP = Cairo time of ob. to nearest hr. (Subtract 2 hrs. to obtain G.M.T.) (2) R = manner in which pilot balloon is lost :— 1 = lost in cloud, termination of ascent marks cloud level 2 = eclipsed by lower cloud 3 = lost in distance or haze 4 = lost in bright sun or moonlight 5 = balloon burst 6 = lost accidentally 7 = confused with star, last group uncertain 8 = confused with star, last two groups uncertain 9 = none of the above apply (3) h₂ = height at which V.W. is reported 0 = surface 0 = 10,000 ft. 1 = 1,000 ft. 1 = 11,000 ft. 2 = 2,000 ft. etc., etc.</p> <p>(4) V.W. are normally given at 1,000, 3,000, 6,000 and 10,000 ft. (5) x = missing figure (6) Pilot balloon ascents are made as near 0500 as possible. When extra ascents are made, they are prefixed by the group InIn PPR</p>	<p>Synoptic Stations: 01 Sollum 02 Aboukir 03 Helopolis 07 Abu Sueir 08 Ismailia 10 Suez 11 Ramleh 12 Baghdad 13 Mosul 14 Shalbah 15 Bushire 16 Bandar Abbas 17 Charbar</p>	<p>01 Constantinople 03 Haushoum 04 Blaavands Huk 05 Hammeren</p>
				S. V.W.	0500	<p>InIn PPR BBDD FWWT cbWVH h₂ddvv, etc. . .</p> <p>Notre : (1) PP = Cairo time of ob. to nearest hr. (Subtract 2 hrs. to obtain G.M.T.) (2) R = manner in which pilot balloon is lost :— 1 = lost in cloud, termination of ascent marks cloud level 2 = eclipsed by lower cloud 3 = lost in distance or haze 4 = lost in bright sun or moonlight 5 = balloon burst 6 = lost accidentally 7 = confused with star, last group uncertain 8 = confused with star, last two groups uncertain 9 = none of the above apply (3) h₂ = height at which V.W. is reported 0 = surface 0 = 10,000 ft. 1 = 1,000 ft. 1 = 11,000 ft. 2 = 2,000 ft. etc., etc.</p> <p>(4) V.W. are normally given at 1,000, 3,000, 6,000 and 10,000 ft. (5) x = missing figure (6) Pilot balloon ascents are made as near 0500 as possible. When extra ascents are made, they are prefixed by the group InIn PPR</p>	<p>Synoptic Stations: 01 Sollum 02 Aboukir 03 Helopolis 07 Abu Sueir 08 Ismailia 10 Suez 11 Ramleh 12 Baghdad 13 Mosul 14 Shalbah 15 Bushire 16 Bandar Abbas 17 Charbar</p>	<p>01 Constantinople 03 Haushoum 04 Blaavands Huk 05 Hammeren</p>

DOMINICAN REPUBLIC
Santo Domingo

EGYPT
Cairo (Royal Air Force),
BU, 1,800 cw.

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
ETHIOPIA Revel, ELN, 2,000 sp.	0740	0700 L.T.	S.	In BBBDD FWTW" b'b'b'RR MMmm ..	O.I.C. (mod.)	W" in Nauen Code b'b'b' = bar. tendency in tenths of mm. during the 3 hours preceding the time of ob.
	2100	1300 L.T. 2100 L.T.	I. S. S.	Followed by ice report (see Hydrographic Section) In BBBDD FWTW" In BBBDD FWTW"	"	A falling bar. is indicated by the addition of 500 to this number
FAROE ISLANDS Thorshavn, OXJ, 600	on request	—	—	In BBBDD FWTW" Note (1) x = missing ob. Stations: 1 Reval, 2 Dorpot, 3 Filsand, 4 Hungerburg Brief repetition of the meteorological information published by the Thorshavn Meteorological Institute	"	
FILIPINE ISLANDS Suva, VPD, 600 sp. .. (From 1st May—1st Oct.)	0930	2100	S.	Barometer reading in inches to three dec. places if possible (cor- rected for height and to 32° F.); dry and wet bulb thermometer readings; direction and force of wind; state of sky (scale 0-10). Example:—(Station name) 2990 78 76 SE5 10.	—	The charge for each message will be one franc
(From 1st Nov.—30th April, hurricane sea- son) The 0200 bulletin is not sent on Saturdays, Sundays or holidays.	0200 0930	2100 0300	W. S. W. S.	Meaning:— Barometer—29.90 inches Thermometer—dry bulb 78° F. Wet bulb 76° F. Wind—S.E. Force 5 (Beaufort Scale) Sky—Overcast Storm warning	Special	Stations: Apia (Samoa) Nukunora (Tonga) Fila (New Hebrides) Norfolk Is. Suva Note: Ob. at Fila are taken at 2200 and 1000 G.M.T.
Lambasi, VPE 600 sp.	— 0300 2200	— — —	W. W. S.	W.R. transmitted to Suva daily except Sunday, from December 1st to April 1st. Message includes height of bar. in inches to 3 dec. places, direction of wind, wind force on Beaufort Scale and remarks on the state of the weather if unsettled Example of message:—Weather 29834 SE5 gusty and heavy rain Meaning:—bar = 29.834 inches; wind S.E. force 5, state of weather, gusty and heavy rain	p.l. p.l.	Weather reports from ships within radio range of Fiji addressed to Suva (with no cost to the sender) will be gladly received, more particularly during the hurricane season, and in the following order: Time (G.M.T.), latitude, longitude, barometer cor- rected for height and 32° F., dry and wet bulb, wind and force, and the amount of clouds thus: 0930 16 30 S 17520 W 2990 78 76 SE5 10 Units: inch, F.
Tavuni, VPF .. 600 sp.	—	—	—	—	—	—
FINLAND Sandhamn, OJA, 4,500 sp. ..	0255 0830	0100 0700	S. S.	"Météo Finland" (or only) BBBDD FwWTT cbWVH ALANh In In BBBDD FwWTT cbWVH ALANh RRNR (inland stations) In In BBBDD FwWTT cbWVH ALANh RRSVr (coastal stations)	N.I.C.	Synoptic. Stations: 01 Helsingfors (C) 02 Stockholm (D)

Eiffel Tower, P.L.,
7,300 cw. daily

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Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature or report.	Form of Message.	Code used.	Notes.		
FRANCE—continued								
				STATIONS—continued. 47 Mont-Ventoux 48 Mont-Aigoual 51 Zurich * 52 Bern * 53 Geneva * 54 Lugano * 55 Saentis (2,500m.) * 61 Utrecht (De Bilt) *	62 Helder * 63 Flushing * 64 Groningen Only the stations marked * appear in the reports; the others are given only when the customary ob. do not come to hand			
				STORM SIGNALS— <i>Form of message</i> :—The message is sent <i>en clair</i> . It commences with the name of the day of the week, the duration of time for which the warning is valid, followed by the word "Tempête," and the probable direction from which the gale may be expected. <i>Example of message</i> :—Jeu di 15 heures Manche tempête, N.W. Bretagne Océan tempête, S.W. Méditerranée tempête, S.W. <i>Translation</i> :—Storms or gales are predicted (or will continue) from now until 1500 to-morrow in the areas and from the directions mentioned				
						STORM SIGNALS : Wireless storm signals are broadcast at the times indicated when the forecasts show the wind to exceed 50 ft. (15m.) per sec. (Force 7 on Beaufort scale) For the purpose of these signals the coasts of France have been divided into the following areas :— "Manche" :—From the Belgian frontier to the parallel of St. Helier. "Bretagne" :—From the parallel of St. Helier to (and including) Noirmoutiers "Océan" :—From Noirmoutiers to the Spanish frontier "Roussillon" :—From the Spanish frontier to Farman "Provence" :—From (and including) Farman to the Italian frontier (including Corsica) "Méditerranée" :—This is only used when it is feasible to send one message covering the areas "Roussillon" and "Provence"		
Eiffel Tower, FL, 2,600 sp.	1005	0700 — 0100 0100	S. O. S. O.	"ONM" "Météo Europe" (or-60) InIn BBDDF w.TTK'R (Occasionally) "Navires" POLLL HGG BBDDF "Météo Amérique" PPGG In (or InIn or InIn) BBDF followed by the positions of the centres of highest and lowest pressure in the following form : Name of station <i>en clair</i> BBDF (Ob. from Annulsen Polar Expedition vessel "Maud" occasionally) "Maud" POLLL HGG BBDDF TTTw.	N.I.C. " " " "	INTERNATIONAL COLLECTIVE REPORT STATIONS : 01 Paris 02 Madrid 03 Vienna 04 Stockholm 05 Liverpool 06 Lyons		

11 Brest

12 Algiers

13 Warsaw

14 Bronoy

15 Kenfrew

16 Bucharest

17 Tunis

18 Prague

19 Ingoy

20 Seydis Fjord

21 Perov

22 Gènes

23 Lemberg

24 Copenhagen

25 Perpignan

26 Lister

(continued in previous column)

pp = day of month
w₂ = state of weather code
0 = clear sky, fine
2 = cloudy with intervals of blue sky
4 = overcast
5 = rain, drizzle or hail
6 = snow or sleet

NOTES: (1) The American observations are preceded by a four-figure group, the first two figures of which indicate the day of the month, and the last two the hour of the ob.

(2) Obs. from the ship "Maud" have been included since Oct., 1922, and will be continued for a period of about 2 years

(3) Bar. pressure for American stations is given in mm.

27	Corunna	59	Belgrade
28	Aspio	60	Pernusato
29	Helsingfors	J	St. Johns (Newfoundland)
30	Mahon	S	Sydney (Nova Scotia)
31	Budapest	FP	Father Point
32	Holyhead	PN	Parry Sound
33	Zurich	WR	White River
34	De Bilt	WI	Winnipeg
35	Rome	LP	Le Pas
36	Croydon	ED	Edmonton
37	Hamburg	T	Nantucket
38	Bordeaux	WA	Washington
39	Brussels	H	Haiteras
40	Valencia	C	Charleston
41	Rabat	B	Bermuda
42	Lisbon	K	Key West
43	Horta	LR	Little Rocks
44	Messina	NV	Nashville
45	Reykjavik	V	Cleveland
46	Helwan	CH	Chicago
47	Oran	DU	Duluth
48	Cassel	HN	Huron
49	Malta	SLC	Salt Lake City
50	Constantinople	HL	Helena
51	Taranto	DV	Denver
52	Sofia	RO	Roseburg
53	Bizerta	TAT	Tatoosh
54	Itripoli	SF	San Francisco
55	Agadir	DI	San Diego
56	Athens	FW	Fort Worth
57	Funchal	EP	El Paso
58	Tangiers		

See next page

F. F. F.

— — —

0640
1115
1710
2210

Paris, FL, 2,600 R/T

Meteorological Transmissions—Continued

FRANCE—continued.

FORECASTS FOR AGRICULTURE AND AERIAL ROUTES.

The Eiffel Tower broadcasts daily by TELEPHONY weather forecasts intended primarily for those engaged in agricultural pursuits. These reports are broadcast four times daily at 0640, 1115, 1710 and 2210 on a wavelength of 2,600 m.

(1) *Messages begin*: "Voici les prévisions agricoles de l'Office National Météorologique pour la nuit du . . . au . . . et la journée du . . ."

or "Voici les prévisions agricoles de l'Office National Météorologique pour la journée du . . ."

(2) The meteorological elements predicted are given below and are transmitted in the order indicated:—

Elements Predicted.		Given in one or more of the undermentioned terms.		Elements Predicted.		Given in one or more of the undermentioned terms.	
(a) General prevailing situation	..	e.g. temps chaud temps orageux temps froid temps pluvieux temps à averses et éclaircies temps brumeux temps neigeux		(d) Rainfall expected	..	e.g. pluies averses neiges	
(b) Wind (i) direction (i.e., direction from which winds blow) (ii) force		e.g. nord, nord-est, est, sud-est, etc. e.g. faible, modéré, fort, très fort		(e) Temperature— (i) probable minimum temperature during the night (ii) probable maximum reached during the day (iii) indication of changes		} a number } e.g. en hausse, en baisse ou stationnaire	
(c) State of the sky (amount of sky covered with cloud)		e.g. pur (none or very few clouds), nuageux (sky half covered), très nuageux (sky three-quarters covered), couvert (sky completely covered)		(f) Other information endangering crops		e.g. gelées, orages, grêles, tempêtes, brouillards	

(3) The above information is given for the following regions in the order indicated:—

"Voici les prévisions agricoles pour la région . . ."

1. *Nord*. (Aisne, Nord, Pas-de-Calais, Somme).

2. *Bretagne*. (Côtes-du-Nord, Finistère, Ille-et-Vilaine, Morbihan).

3. *Nord-Ouest*. (Calvados, Eure, Mayenne, Manche, Orne, Sarthe, Seine-Inférieure).

4. *Parisienne*. (Eure-et-Loir, Oise, Seine, Seine-et-Marne, Seine-et-Oise).

5. *Nord-est*. (Aube, Ardennes, Bas-Rhin, Haut-Rhin, Haute-Marne, Marne, Meuse, Meurthe-et-Moselle, Moselle, Vosges).

6. *Ouest*. (Charente, Charente-Inférieure, Deux-Sèvres, Indre-et-Loire, Loire-Inférieure, Maine-et-Loire, Vendée, Vienne).

7. *Centre*. (Cher, Indre, Loiret, Lot-et-Cher, Nièvre, Yonne).

8. *Est*. (Ain, Côte-d'Or, Doubs, Haute-Saône, Hautes-Alpes, Haute-Savoie, Isère, Jura, Rhône, Saône-et-Loire, Savoie).

9. *Massif Central*. (Allier, Aveyron, Cantal, Corrèze, Creuse, Haute-Loire, Haute-Vienne, Loire, Lozère, Puy-de-Dôme).

10. *Sud-Ouest*. (Ariège, Basse-Pyrénées, Dordogne, Gers, Gironde, Haute-Garonne, Hautes-Pyrénées, Landes, Lot, Lot-et-Garonne, Tarn, Tarn-et-Garonne).

11. *Sud*. (Ardèche, Aude, Cantal, Corrèze, Creuse, Haute-Loire, Haute-Vienne, Loire, Lozère, Puy-de-Dôme).

Form of Message.

EUROPEAN COLLECTIVE MESSAGE.
(1). Eight French and eight English stations only are selected from the list daily

p.l.
O.I.C.

"Météo Phisérar"
Forecast for France for day of issue (repeat of 0200 F Message from Eiffel Tower)
InIn BBDD FW3bb
Stations: (1) French
003 Bordeaux
007 Dijon
009 Limoges
010 Lyons
015 Paris
018 Rennes
019 Strasbourg
020 Toulon
021 Toulouse
022 Tours
028 Amiens
032 Metz
(2) English
101 Lerwick
103 Stornoway
107 Aberdeen
110 Malin Head
111 Renfrew
115 Lynemouth
120 Blacksod Point
133 Holyhead
143 Nottingham
145 Yarmouth
150 Valencia
152 Pembroke
161 Croydon
170 Scilly

F.
S.

0100
0100

0330

FRANCE—continued.
Le Bourget (Paris), ZM,
1 680 cw.

Call, Wavelength.

of report.

ob. G.M.T. G.M.T.

0300 0500 0600 0800 1100 1400 1500

0400

0428

Le Bourget, ZM, 1,680 G.W.

AVIATION SYNOPSIS (special aerial routes)

N.I.C.

InIn (Vs) wwVIL NDDFW
(Ob. at Paris just before transmission of message) InIn wwVhL

AVIATION SYNOPSIS

N.I.C.

0400 "PLBA" InIn (Vs) BBDD FwwTT cbWVH ALAnh
CaddF,S
InInhd,d,v,v₁ d,d,v,v₁, etc.
(Ob. at Paris just before transmission of message) InIn wwVhL

Special N.I.C.

These give the probable changes with reference to the actual weather given in the last hourly message
They are given in plain language under four different headings, each commencing with the letters AL followed by one of the letters A, B, C or D. Thus —
After the letters ALA follows information as to state of sky, height of cloud, precipitation
After the letters ALB follows information as to wind at surface
After the letters ALC follows information as to wind at 1,000 m. (3,000 ft.)
After the letters ALD follows information as to visibility
The forecasts are given for different areas, the different parts commencing with the letters PARS

d,d₁ = direction of wind on the scale 01-32
v,v₁ = speed of wind in metres per second
The groups d,d₁v,v₁ relate to the following heights:—
500 m. 1,500 ft.
1,000 m. 3,000 ft.
1,500 m. 5,000 ft.
2,000 m. 7,000 ft.
3,000 m. 10,000 ft.
4,000 m. 13,000 ft.

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob- serv. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
FRANCE—continued.				FORECASTS—continued.		
				<p>Index.</p> <p>PARSA Paris to Abbeville</p> <p>PARSB Abbeville to English Coast</p> <p>PARSC Paris to Novon</p> <p>PARSD Novon to Brussels</p> <p>The letters PARS may be followed by one or by several letters, e.g., PARSABC indicating that the following sentence refers to the three districts A, B and C.</p> <p>When no change is anticipated in any particular division the word "NIL" is sent.</p> <p>The indices PARSL to PARSL relate to aerial routes from Paris other than to London, Brussels and Amsterdam. The following indices are used in the general forecasts for France —</p> <p>Index.</p> <p>PARSM North</p> <p>PARSN Brittany</p> <p>PARSO North-West</p> <p>PARSP Paris</p> <p>PARSQ North-East</p> <p>PARSR Central</p> <p>PARSS West</p> <p>PARSV East</p> <p>PARSU Central Plateau</p> <p>PARSX South-West</p> <p>PARSY South</p> <p>PARSZ South-East</p> <p>If the letters "PARS" are missing altogether, the forecast refers to the whole of France.</p> <p>The letters "AUTRES PARS" indicate that the following forecast refers to all districts not previously mentioned in the message.</p>		
Le Bourget ZM, 1.630 c.w.	0728 1028 1328 1628 1928 2228	0700 1000 1300 1600 1900 2200	S. S. S. S. S. UW	<p>[0700] "FLBA" (PA, P2, P5) InIn(Vs) BBBDD FwTt cbWVH "</p> <p>ALANb CaddF.S.</p> <p>(P3, P4, BV, CO) InIn(Vs) wwVbL NDDFW CaddF.S. "</p> <p>(Ob. at Paris just before transmission of message) InIn wwVbL</p> <p>[0900] "FLBA" InIn(Vs) wwVbL NDDFW</p>		<p>When an ascent has not been made, one of the following groups is sent: XXXXX meaning ascent not made for reasons independent of meteorological conditions</p> <p>PLUHE meaning ascent impossible owing to rain</p> <p>NEIGE meaning ascent impossible owing to snow</p> <p>ORAGE meaning ascent impossible owing to thunderstorm</p> <p>GRAIN meaning ascent impossible owing to line squall</p> <p>BRUME meaning ascent impossible owing to mist</p> <p>BROUI meaning ascent impossible owing to fog</p> <p>PLHHH meaning clouds too low, the three letters HHH being replaced by three figures giving the height of the cloud base in metres</p>

Reports omitted from this Synoptic form.

under
FL

0700
S.

III = longitude in degrees and tenth
K₁ = state of sea (see Eiffel Tower
synoptic)

AVIATION—GENERAL REPORTS.

The W/T stations of Cherbourg,
Brest, Lorient and Rochefort transmit
signals concerning the following
areas:—Manche, Bretagne, Océan
The W/T stations of Toulon and
Ajaccio transmit signals con-
cerning the Mediterranean area (for
details of areas see notes under Eiffel
Tower storm signals)
When the time of sending falls
outside the watch kept by ships
carrying a single operator, the message
is repeated at the commencement of
the succeeding watch

SYNOPTIC STATIONS—

05 Cherbourg ob.
55 The Hague

0950	F.	Forecasts for aerial routes other than Paris-London-Brussels ... (Reports from ships) QLLX ₁ ILLX ₂ BBDDX ₃ FVK ₁ DX ₄ wwGGX ₅	p.l. N.I.C. (mod.)
1530	S.		"
1250	F.	Forecast for aerial routes other than Paris-London-Brussels Y.YaYzZ	"
1450	F. S. U.W. O.	Occasional forecasts Reports omitted from 1420 synoptic message from Eiffel Tower	" See under FL
1650	F.	Occasional forecasts	synoptic p.l.
0630	S. U.W. }	" Météo Paris "	
0650	F.	" Avis matinée " forecast for whole of France see code above as in Aviation Synoptic Reports	p.l.
1150	F.	" Avis après midi " forecast for whole of France, Code as for 0650 message above	p.l.

Storm warnings preceded by the International Safety Signal
— — —
The storm signal is repeated three times at intervals of 10 mins.

Cherbourg, FUC
Brest, FUE
Lorient, FUN
Rochefort, FUR
Ajaccio (Corsica), FUI
Porquerolles, FUQ
(Hveres Is.)
(all 600 sp.)

W.

" Météo Cherbourg "

Same form as Eiffel Tower National Synoptic

0115	S. U.W. }	0100	
	O.	0100	
0715	S. U.W. }	0700	
	O.	0700	
1315	S. U.W. }	1300	
	O.	1300	
1815	S. U.W. }	1800	
	O.	1800	

Cherbourg, FUC,
3,300 cw.

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
FRANCE—continued Brest-Mengam, FUE, 2,800 cw.	0125 0725 1025 1325 1825 2145 0115 0715 1015 1315 1815 1230	— — — — — — — — — — — — —	— — — — — — — — — — — — —	These messages are sent in the same manner as for Cherbourg and commence "Météo Brest"	—	SYNOPTIC STATIONS— 11 Brest Naval College 61 St. Mathieu 62 Ushant
Lorient (Peri-Mané), FUN, 2,800 cw.	0125 0735 1025 1325 1425	— — — — —	— — — — —	As for Cherbourg (above) "Météo Lorient"	—	SYNOPTIC STATIONS— 17 Lorient (Gavres) 70 Er-Hastellie
Nantes—(Basse Landes), UA, 2,800 sp.	0125 0735 1025 1325 1425	— — — — —	S. F.	Broadcasts <i>en clair</i> the general meteorological situation in the North Atlantic together with a forecast	p.l. French	SYNOPTIC STATIONS— 01 Rochefort 03 Bordeaux 42 Angoulême 75 Chassiron 76 La Coubre 77 Cazaux 78 Arcachon
Rochefort, FUR, 3,300 cw.	0150 0750 1050 1350 1850	— — — — —	— — — — —	These messages are sent in the same manner as for Cherbourg "Météo Rochefort"	—	SYNOPTIC STATIONS— 02 Bayonne 12 Nîmes 14 Montpellier 16 Perpignan 20 Toulon 21 Toulouse 23 Antibes 25 St. Raphael 26 Ajaccio 31 Marnaghe 33 Montélimar 47 Pic du Midi 51 I. du Levant 55 Istres 58 Sauguinaires 59 Cap Corse 60 Portofino
Porquerolles (Hyères Is.), FUQ, 3,300 cw.	0150 0750 1050 1350 1850	— — — — —	— — — — —	As for Cherbourg (above) "Météo Toulon", Upper air ob. at 0900 or 1800.	— — —	SYNOPTIC STATIONS— 02 Bayonne 12 Nîmes 14 Montpellier 16 Perpignan 20 Toulon 21 Toulouse 23 Antibes 25 St. Raphael 26 Ajaccio 31 Marnaghe 33 Montélimar 47 Pic du Midi 51 I. du Levant 55 Istres 58 Sauguinaires 59 Cap Corse 60 Portofino

FRENCH INDO-CHINA
Mitho, FCA, 600 (2,000)

0400
1800
on
request

S.W.
S.W.

Weather report *en clair* followed by typhoon warnings (when necessary)
The weather report issued by Fu Lien Meteorological Ob. (Haifong) is also transmitted on request

Tourane, FLT, 600
(1,800)

on
request

S.W.

The weather report issued by Fu Lien Ob. (Haifong) is transmitted on request and also typhoon warnings

Hanoi, FAO ..

0230

—

GERMANY
(North Sea Coast)
Königswusterhausen,
LP, 5,250 c.w.

0840

S. I.

“Wetternachricht Vormittags”
In In BBBDD FWITW 8bbRR MMmmW”
Followed by ice report (winter months only). See Hydrographic Section.

1940

S.

“Wetternachricht Abends” In In BBBDD FWITW 8bb ..
Stations:
01 Borkum 08 Cassel 15 Fürth
02 Keitum 09 Berlin 16 Zugspitze (2,964 m.)
03 Hamburg 10 Dresden 17 Kahler Asten (852 m.)
04 Swinemünde 11 Breslau 18 Brocken (1,148 m.)
05 Danzig 12 Frankfurt 19 Fichtelberg, (5,213 m.)
06 Memel 13 Karlsruhe 20 Vienna
07 Aachen

SYNOPTIC

H = rel. humidity in N.I.C.
W = weather in past 24 hours in Nauen Code

O.I.C. (mod.)

O.I.C. (mod.)

0650

S. S.

O.I.C. (mod.)

INTERNATIONAL COLLECTIVE
Central European time is used in all these messages. See Note (2)

1800
(previous day)
0700
(previous day)

S. S.

“

“Funk obs. nacht” (03) In In BBBDD FWITW 8bbRR ..
(Great Britain, Poland and French Stations) In In BBBDD FWIT 8bb
In In BBBDD FWIT 8bb
(Finland, Prague, Budapest, Spain, Italy, N. Africa) “Nachtrag”
(76-79) “Nachtrag”, In In BBBDD FWIT 8bbRR
(Ship obs. are sometimes added. See code next page)

0850

S. S.

“

“Funk obs. I” (Holland, Denmark, Sweden, Norway, Great Britain, Estonia, Poland, France, Switzerland, Belgrade, Bucharest, Sofia), In In BBBDD FWIT 8bbRR
Followed by any stations omitted from 0900 synoptic message
(Ship obs. are sometimes added. See code next page)

W” in Nauen Code

CEL = CETO
CORS = Cap Corse
CROIS = Cap Croisette
LEV = l du Levant
PERT = Pertusato
RAPH = St. Raphael
SANG = Iles, Sanguinaires
SIC = Sicile

Meteorological Transmissions--Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
GERMANY (North Sea Coast)— <i>continued</i> Königswusterhausen, LP, 5,250, c.w.	1550	1300 1300	S. S.	"Funk obs. II" (01-10) InIn BBDD FWTTW", 8bb (Holland, Denmark, Sweden, Norway, England, Poland, France, Switzerland, Belgrade, Bucharest, Sofia) InIn BBDD FWTT 8bb "Nachtrag" (Finland, 68, 69, Spain, North Africa, Iceland, 93) InIn BBDD FWTT 8bbRR (Ship obs. are sometimes added. See code below) "Funk obs. III" (Same stations as for 1300 ob. (1850 message) above) InIn BBDD FWTT 8bb "Nachtrag" (Finland, 68, 69, Spain, North Africa) InIn BBDD FWTT 8bb Followed by ob. omitted from 1940 synoptic message (Ship obs. are sometimes added. See code below)	" " " " " "	W" = past weather between morn- ing and afternoon where o = mainly fine 1 = fair (high clouds preponder- ating) 2 = mainly overcast (low clouds preponderating) 3 = sheet lightning—more than one flash 4 = slight precipitation 5 = heavy rain 6 = heavy snowfall 7 = thunderstorm 8 = passing showers 9 = persistent precipitation ZZ = time of ob. (Central European time) LLL = lat. III = long. (If long. is East of Greenwich, 500 is added to III) tt = water temp. in whole degrees C.
	1950	1800 1800 1300	S. O. S. S. S.	Code for ship ob. (from the Atlantic): "Dampfer" or "Schiff" ZZLLL illit BBDD FWTT NOTE: (1) When ob. from stations not included in the list below are missing ob. from neighbouring stations are included with name of station in full (2) The time of ob. is indicated in the messages by prefixing two figures, giving the hour of ob. to the index number of the first station observing at this time, e.g., the group 1401 means that the ob. at station 01 and the following stations were made at 1400. Central European Time is used in all messages. Subtract one hour to obtain G.M.T.	Special O.I.C.	
	—	—	O.	Stations:— 01-20 as in synoptic message above 21 Helder 22 Flushing 23 De Bilt 24 Copenhagen 25 Skagen 26 Hantsholm 27 Haparanda 28 Hernösund 29 Stockholm above 43 Calshot 44 Scilly 45 Holyhead 46 Stornoway 47 Blacksod Point 48 Valencia 49 Helsingfors 50 Sortavala 51 Dorpat 66 Geneva 67 Lugano 68 Prague 69 Budapest 70 Belgrad 71 Bukarest 72 Sofia 75 Corunna 76 Madrid		

Station	Time	Wind	Bar	Temp	Humid	Cloud	Vis	Remarks
Borkum, KBM, 1,250	0635	0500	S.	U.W.	U.A.T.	U.A.T.	U.A.T.	U.A.T.
Wilhelmshaven, FUL, 1,250	0635	0500	S.	U.W.	U.A.T.	U.A.T.	U.A.T.	U.A.T.
Amrum Bank Light Vessel, KAF, 300	0705	0700	—	—	—	—	—	—
Cuxhaven, KCX ..	0705	0700	—	—	—	—	—	—
Borkum Riff Light Vessel, KBR, 600	0705	0700	—	—	—	—	—	—
List, KAL, 1,250 ..	0705	0700	—	—	—	—	—	—

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
GERMANY <i>(North Sea Coast)—continued</i>						
Norddeich, KAV, 600 and R/T.	1015 1630 2130	0700 — 1900	S.F. W. S.F.W.	Message contains (1) Surface obs. from stations given (2) General review of the weather (3) 12 hours' forecast for the North Sea W = storm warning for the North Sea sent <i>en clair</i> and repeated three times A special bulletin for the North Sea Coast prepared by the German Sea Observatory, Hamburg, at 0900, is transmitted on request Plain language W.R.	p.l.	Stations: Borkum Light Vessel List, Skudenesnaes, Lynemouth Storm warning is sent at time stated and also immediately on receipt from the Deutsche Seewarte A charge is made for this report
Norddeich, KAV, 600, 1,800 R/T.	—	0900	—	—	—	—
Northholz, KBN, 1,250	0510 0910	—	—	—	—	—
GERMANY (Baltic Coast) Königsberg, KO, 2,600	0805 1903 1140	0700 1300 —	S. S. W.	BBDD FwTPP obRR MMmmW BBDD FwTW' obb Storm warning for the Eastern Baltic	N.I.C. p.l.	Synoptic Stations : Königsberg, Memel Synoptic messages Stations: Pillau, Brusterort
Pillau, KAP, 600 sp.	0730 1330 1630 1130	— — — —	— — — —	"Wettervorhersage für die Ostliche See" The message contains a general review of the weather and a forecast for the Eastern Baltic, together with 0700 ob. at Memel and Visby "Sturmwarnungen für die Ostliche Ostsee" (storm warning for the Eastern Baltic) Storm warning as for 1130 message " " " " "En clair" message " " "	— — — —	Note: When this messages fail to reach the station to time the word "Verspatet" (bulletin delayed) will be sent at 1130 instead. It will, if delayed, be transmitted on arrival (W) Storm warnings also sent immediately upon receipt
Adler-Grund Light Vessel KAG, 300	0730 1030 1630	— — —	— — —	BBDD FwTTS BBDD FwTTS followed by ob. at 0900 from Marienleuchte, giving wind direction and force, state of sky and sea, visibility and weather	— — —	(Sea visibility in mi.) Note.—At the request of ships and on payment of a charge, weather reports exceeding 25 words sent
Litbeck, HMB, 800 Bulk KBK, 820 sp.	0830 0710 1010 1630	— — — —	S. S. — —	— — — —	p.l.	—

(iv) storm warnings are for the
A charge is made for this report

A special report for the Central and Western portions of the Baltic Coast, prepared by the German Sea Ob. at Hamburg, is transmitted on request.

Storm warnings also transmitted immediately upon receipt

BBDD FwTTP cbbRR MmMnW, followed by wind vel. and ob. from Adlergrund Light Vessel

Repeat of Adlergrund Light Vessel's ob.

"

BBDD FwTTW² cbbPA*

BBDD FwTTW¹ cbb

Followed by ob. from Adlergrund Light Vessel "Funkwetter". General forecast of weather at Bulsk, Adlergrund, Skagen and Visby and forecast for Western and Middle Baltic Storm warnings are preceded by the word "Funkturm"

Storm warnings for the Western and Central Baltic are transmitted twice in succession immediately upon receipt and then at the times given

Storm warnings are also broadcasted immediately upon receipt

A special bulletin for the central and western portions of the Baltic coast, prepared by the German Sea Observatory, Hamburg, at 0900, for which a charge is made, is transmitted on request.

At 1200, Swinemünde Weather Observatory (Deutscher Seewarte) issues a forecast for the Southern Baltic, which is transmitted on request.

- (1) mgmg = grass minimum temp. in whole degrees F.
- (2) Barometric tendency is not reported, xx is substituted for this
- (3) Reports not issued on Sundays

600 sp. for message	for 1100	on request	
Swiniemünde, KAW, 1,000 sp.	..	0725 1045 1045 1325 1825	— W. — — —
600 sp.	..	1030 2145 0530 1650	F.W. F.W. W. W.
Breslau, BÜ, 1,950	0750 1303 1830	—
Berlin, DK, 2,000	0745 1425 1835	—
Frankfort-a-M., FM, 1,850	..	0730 1335 1840	—
Munich, MU, 1,850	0805 1340	—
Freidrichshafen, FD, 1,950	..	0720 1815	—
GIBRALTAR			
BWV, 4,800 cw. (Sun. excepted)	..	0730 1840	S. 1800

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
GREAT BRITAIN Air Ministry, GFA 4,100 cw.	0850 1450	0700 1300 0700	S.S.S.	InIn BBDDF w.TTKR InIn BBDDF w.TTKW InIn BBDDF w.TTKR Synoptic stations: Col. (1) 01 Jan Mayen 02 Ingoy 03 Bronnoy 04 Lister 05 Kinn 06 Haparanda 07 Stockholm 08 Copenhagen 09 Blaavands 20 De Bilt 21 Helder 22 Brussels 23 Paris † 24 Brest † 25 Rochefort † 26 Bayonne † 27 Lyons † 28 Mayence † 29 Marignane † 30 Zurich † 41 Corunna × 42 Horta × 50 Berlin × † 51 Munich × † 52 Warsaw † 53 Posen † 54 Prague × 60 Genoa × † 61 Rome × † 80 Malta × 81 Helwan × 84 Gibraltar × (1) InIn BBDDF FwTTT cBwVH ALANh CddVY (92, 93, 94, 96) BBDDF FwTTT cBwVH ALANh CddVY (92, 93, 94, 96)	N.I.C. " "	INTERNATIONAL COLLECTIVE NOTES: (1) For stations marked † in the list of synoptic stations, w represents present weather in O.I.C. (Code 1, state of Sky W.) (2) The stations in Col. 2 are only used when the information for the corresponding station on the same line in Col. 1 is missing. (3) For stations marked × 7h. reports are issued at 1450 if not received in time for issue at 0850. No 13h. reports are issued for these stations (4) In the case of stations from which past weather W is not received a hyphen is inserted in its place in the group
				Col. (2) Bear Island 11 Vardo 12 Rost 13 Skuttsnaes 14 Valdersund 15 Harnosund 16 Wisby 17 Bornholm 18 Hanstholm 19 Flushing 31 34 St. Mathieu † 35 Ile d'Aix † 36 Bordeaux † 37 Dijon † 38 Strasbourg † 39 Toulon † 40 Bern † 43 Ponta Deigada × or 44 Funchal × † 55 Hamburg × † 56 Vienna × † 57 Lemberg † 58 Breslau × † 59 Koscice † 65 Leghorn × † 66 Taranto × † 69 Palermo × †		
Air Ministry (London), GFA, 1,400 cw. for	0200	0100	S.	(1) InIn BBDDF FwTTT cBwVH ALANh CddVY (92, 93, 94, 96) BBDDF FwTTT cBwVH ALANh CddVY (92, 93, 94, 96)	N.I.C.	SYNOPTIC STATIONS BELOW

NOTE:—In cases of breakdown, message will be transmitted on 1,400 cw. ten mins. after the routine time

0700	U.W. U.A.T. O.	(1) In In BBDD FwwTT cbWVH ALaNH RRSVsr C _{ddVV} (for Inland Stations) In In BBDD FwwTT cbWVH ALaNH RRSVsr C _{ddVV} (for Coastal Stations) (94, 95) In In B ₂ B ₂ cb'b' BBDD FwwTT cbWVH ALaNH (92, 93, 94, 96) In In B ₂ B ₂ cb'b' BBDD FwwTT cbWAN .. (2), (3) and (4) as for 0200 message	02 Wick (C) 03 Castlebay (C) 04 Na h-Eil (C) 07 ABERDEEN (C) 09 Leith (L) 10 MALIN HEAD (C) 11 RENFREW (L) 12 INCHKEITH (C) 13 Eskdalemuir (L) 15 TYNEMOUTH (C) 20 BLACKSD POINT (C) 22 Donaghadee (C) 25 Flamborough (C) 31 Birr Castle (L) 32 Baldonnell (L) 33 HOLYHEAD (C) 34 Liverpool (C) 35 Shotwick (L) 36 Manchester (L) 38 Spurn Head (C) 42 Castle Bromwich (L) 43 Nottingham (L) 44 CRANWELL (L) 45 YARMOUTH (C) 46 Pulham (L) 47 Felixstowe (C) 50 VALENCIA (C) 51 Roche's Point (C) 52 PEMBROKE (C) 54 ROSS-ON-WYE (L) 55 Benson (L) 56 Larkhill (L) 57 Andover (L) 58 Farnborough (L) 60 Kew (L) 61 CROYDON (L) 62 Biggin Hill (L) 63 Clacton (C) 64 Shoeburyness (C) 65 Grain (C) 66 Lymington (L) 70 SCILLY (C) 71 Falmouth (Penderennis) (C) 72 Plymouth (C) 73 Portland (C) 74 CALSHOT (C) 75 Beachy Head (C) 76 Dungeness (C) 77 GUERNSEY (C) 78 JERSEY (C)
1800	U.W. U.A.T. O.	(1) In In BBDD FwwTT cbWVH ALaNH RRMmr C _{ddVV} (for Inland Stations) In In BBDD FwwTT cbWVH ALaNH RRSVsr C _{ddVV} (for Coastal Stations) (92, 93, 94, 96) In In BBDD FwwTT cbWAN (2), (3) and (4) as for 0200 message	
1900	U.W. U.A.T. O.		

NOTES: (1) Stations regularly included are printed* in capital letters. If a regular station should be missing on any occasion a neighbouring station is inserted if available. Guernsey is only included at 0100 and 1300 G.M.T. Jersey at 0700 and 1800 G.M.T. (2) Nephusco observations (group C₁ddVV) of medium or high cloud do not always refer to the station to which the cloud group is assigned in the synoptic message, but may have been made at a neighbouring station, not included in the message, if no nephusco observations are available from the synoptic station itself. Nephusco groups are usually not given for more than 6 or 8 stations, which are normally sufficient to give a representation of the upper cloud motion over the British Isles (3) Reports received too late for inclusion in the 0800 and 1400 messages are added to the 0835 and 1435 G.M.T. hourly route messages (*q.v.*) (4) 1000 G.M.T. observations from Valencia, Plymouth and Calshot, 0700 G.M.T. observations from the Azores and additional ship reports are also added to the hourly route messages (*q.v.*) (5) At British Stations, for reports at the standard hours (0100, 0700, 1300 or 1800 G.M.T.), the figure W (past weather) always refers to the preceding period of 5, 6 or 7 hours since the last standard hour. For reports at other hours W refers to the period since the preceding report or the preceding standard hour, whichever is shorter. In the case of present weather (ww), code figures 05 to 09 and 15 to 19, the period of past weather is the last hour B₁P₂ = bar. pressure in whole mm. at 0700 cb¹/b² = characteristic of bar. tendency in half-mm. at 0100

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
GREAT BRITAIN— <i>continued.</i>				NOTES— <i>continued.</i> (6) The bar. pressure in reports from the Faeroes and Iceland are given in mm., and temperature in degrees C. (7) Ships messages not included in the issues at 0700, 1400, 1900 G.M.T., will usually be added to the next morning's issue at 0600 G.M.T.		
				"Meteor"		
	1,680 cw;	0335	S.	0300 (61, 62, 66) InIn (Vs) wwVhL NDDFW	N.I.C.	
		0335	S.	"CND" wwVhL	"	
		0435	S.	0700 (61, 66) InIn (Vs) BBDD FwvTT cbwVh ALANh CaddF.S	"	
		0735	U.W.	(62, 75) InIn(Vs) wwVhL NDDFW CaddF.S	"	
		1335	S.	61 or 66) InIn 49tt hddvV hddvV, etc.	"	
			S.	"CND" wwVhL	"	
		0835	S.	0800 (61, 62, 66) InIn(Vs) wwVhL NDDFW	"	
			F.	Followed by reports received too late for inclusion in 0800 synoptic message from Air Ministry and in same code "Forecast" (Forecast for S.E. England for period of daylight following the time of issue)	Forecast Code N.I.C.	
	0935	0900	S.	"CND" wwVhL	"	
			S.	0900 (61, 62, 66, 75) InIn(Vs) wwVhL NDDFW	"	
			U.W.	(76) InIn(Vs)	"	
			S.	61 or 66) InIn 49tt hddvV hddvV, etc. (only included if no pilot balloon ascent was available for the 0735 message and one has become available since)	"	
	1035	1000	S.	"CND" wwVhL	"	
			S.	1000 (61, 62, 66) InIn(Vs) BBDD FwvTT cbwVh ALANh CaddF.S	N.I.C.	
			S.	(50, 72, 74) InIn BBDD FwvTT cbwVh ALANh	"	
			S.	"CND" wwVhL	"	
	1135	1100	U.W.	1100 (61, 62, 66, 75) InIn(Vs) wwVhL NDDFW	"	
			S.	(61 or 66) InIn 49tt hddvV hddvV, etc.	"	

SYNOPTIC STATIONS

91 THORSHAVN (C)
92 SEDIS FJORD (C)
93 AKUREYRI (C)
94 ISA FJORD (C)
95 KEYKJAVIK (C)
96 VESTMANN (C)

Navigation warnings to airmen of a specially urgent nature are transmitted when necessary at the end of the 0600, 0800, 1400 or 1900 synoptic messages

AVIATION.

= ob. at Croydon 5 min. before time of transmission of message

tt = hr. (G.M.T.) of pilot-balloon ascent

(For stations see Air Ministry GFA synoptic issue). Ob. at 0800 from the Azores are added to the first route report sent after the reception of the ob.

Station.
Horta
"PD"

Ponta Delgada
Code used = N.I.C. (mod.)

BBDD Fwvmm cbwVh CNRRS where pressure is in mbs. and min. temp. in degrees F.

(2) Reports from ships at sea are added to the next report after reception of ob. Code: "Ships" as in synoptic messages (above)
(3) The word "battry" when it

1435	1400	S.	1400	61, 62, 60	InIn(Vs) wwVhL NDLFW	Forecast Code	
		F.			message from Air Ministry and in same code	N.I.C.	
					"Forecast" (same as 0835 F. message)		
1335	1500	S.S.			"CND" wwVhL		
		S.S.			1500 (61, 62, 66, 75) InIn(Vs) wwVhL NDDFW		
		S.S.			(76) InIn Vs		
1635	1600	S.			CND wwVhL		
		S.			1600 (61, 62, 66) InIn(Vs) BBBDD FwvTT cbWVH ALAnh		
					Caddf, S		
					"CND" wwVhL		
0915	0700	F.			"General Interference"	p.l.	
2000	1800	F.			The 2000 message is followed by a coded forecast Group 999 (see below)	Forecast Code	
0900	0700	F.			Coded forecasts for various districts in the British Isles	Special Forecast Code	
1500	1300	F.			Districts.—The area covered by the forecast is included in the message in each case. Normally the areas within which the different forecasts are applicable are, roughly, as follows:—		
2000	1800	F.			Group 111—Southern England (central part): Dorset, Wiltshire, Berkshire, Hampshire		
	approximate only				Group 222—South-east England: London, Middlesex, Essex, Surrey, Sussex, Kent		
					Group 333—Yorkshire, Lincolnshire, Nottinghamshire		
					Group 444—South-east Scotland (places within a 50-mile radius of North Berwick)		
					Group 555—South-west England: Devonshire and Cornwall.		
					Group 666—North-west district: Lancashire, Cheshire, Shropshire and North Wales		
					Group 999—England and Southern Scotland taken collectively.		
					The forecast for this group is appended to the "General Interference" issued at 2000 G.M.T. (see above)	p.l.	
0950	0700	F.S.			"Western"	Special Code	
2130	1800	F.S.			(1) Statement of general meteorological situation and forecast for 24 hours for the Western Seaboard of the British Isles.	(see notes)	
					(2) B ₁ B ₂ d ₁ F ₁ V ₁ B ₂ B ₃ d ₂ F ₂ V ₂ B ₃ B ₄ d ₃ F ₃ V ₃ B ₄ B ₅ d ₄ F ₄ V ₄		
					Note: (1) For missing ob. a hyphen is inserted in the place of each missing figure.		
					K ₁ K ₂ K ₃ K ₄ K ₅		
					Storm warnings are preceded by the International Safety Signal (— — — —) and repeated at short intervals ten times on full power	p.l.	
					Storm signal in plain language		
					Port Patrick, GPK		
					Niton (I. of W.) GNI		
					Lands End, GLD		

This message is sent twice, the first transmission being made at 10 words a minute for the benefit of amateurs

These reports intended especially for mariners
 Stations:
 Subscript 1 refers to Stornoway
 " 2 " Blacksoed Point
 " 3 " Holyhead
 " 4 " Scilly
 " 5 " Dungeness
 BB = bar. pressure in mb. (initial figure 9 or 10 omitted)
 d = direction of wind on scale 0-3
 F = wind force on Beaufort Scale
 V = visibility in N.I.C. for ships at sea
 K' = bar. tendency in N.I.C.
 A gale warning is issued when the strength of the wind is expected to reach or exceed 40 m.p.h. (= Force 8)

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 Storm signal in plain language

warnings sent when necessary

Clifden, MFT, 5,750 sp.

Air Ministry (London),
 GFA, 4,100 cw.

1,300 cw.

warnings sent when necessary

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob- serva- tion G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
GREAT BRITAIN— <i>continued.</i> Fishguard, GRL Seaford Wick, GLV (Liverpool), GKR Cullercoats Valencia, GCC (Newcastle), GCK Malin Head, GMH all 600 sp. Devizas, GKR, 2,100 cw.	— — — — — — — — On request	— 0100 0700 1800 1800	S. O.	These stations transmit weather reports to ships <i>on demand</i> , at the following charges:— (a) Where the information is supplied by the station itself, a charge of 5s. will be made for each message (b) Where the information is not available at the station, but has to be obtained specially from some other source (e.g., the Meteorological Office, London), the charge for each message will be 7s. 6d., which amount includes cost of inland transmission This station transmits weather reports to ships <i>on demand</i> (as above) <i>Reports sent to the Meteorological Office, Air Ministry, from ships at sea</i> NOTE: Ships transmit their reports to Devices on a wavelength of 2,100 cw. as soon after the ob. hours as possible	p.l. Ship's Code	on Beaufort Scale). The warnings are sent by the Meteorological Office, Air Ministry, to those stations which lie within about 150 miles of the area threatened Should these warnings be received and transmitted by a shore station during a period in which ships which carry a single operator are not keeping watch, they are repeated at the commencement of the next single operator period
GREECE Athens, X.G. 3,600 spk.	0705	0600	S.	"Météo Athènes" BBBDD FwWIT cbWVH ALANh RKMmr	N.I.C.	—
HAIN REPUBLIC Port au Prince, NSC, 2,250	—	—	W.	Hurricane warnings and advisory messages relating thereto are transmitted when issued by the Washington Weather Bureau, and repeated every four hours	p.l.	—
HAWAIIAN ISLANDS Pearl Harbour, NPM, 2,250 sp.	0630 1830 2230	— — —	S. F. F.S.	InInIn BBBDF W'bWAC — InInIn BBBDF W'bWAC	See U.S.A. special p.l. See U.S.A. special	At 0630: Barometric pressure, direction and force of wind, and state of weather at Honolulu. At 1830 and 2230: Forecasts for Hawaiian islands and neighbouring ocean areas. (N.B.—The 2230 message is followed by barometric pressure, direction and force of wind, and state of weather at Honolulu). The bulletins are also issued on

dd = day of month of ob.
tt = hr. of day, G.M.T. of ob.

NOTE: The figures in square brackets are different for different messages

AVIATION-SYNOPTIC - AND ROUTE WEATHER REPORTS:

weather repor

- Stations :
 1 Helder
 2 Flushing
 3 De Bilt
 4 The Hague
 5 Schiphol
 6 Rotterdam
 add = day of month

tt = hour of day (G.M.T.)
U.W. are from the result of a pilot
balloon ascent at De Bilt (for heights
up to 1,500 m. Vel. given in km. hr.)
U.T.A. are from results of aeroplane
obs. at Soesterberg and Helder
These are complete aerological
reports
dd = day of month
tt = hour of day (G.M.T.)

SPECIAL REPORT FOR

MARINERS:

- | | Stations: |
|---|------------|
| 1 | Helder |
| 2 | Flushing |
| 3 | Gris Nez |
| 4 | La Hague |
| 5 | Yarmouth |
| 6 | Tynemouth |
| 7 | Skudesnaes |
| 8 | Keltum |

These messages are also sent on request for which a charge is made

Sent daily throughout the year

NOTE: When a hurricane is in progress the Weather Bureau will issue advices regarding its location, direction, progress, and intensity at frequent intervals and these advices

1330	1300	U.A.T. S. U.W. U.A.T.	" " " "	"Temp" for and only in BBDD FwvTt cbwVh BBtTh, etc... In BBDD FwvTt cbwVh ALnH CddVv... Same as for 0730 U.W. U.A.T. message	N.I.C. " " " " p.l. N.I.C.
1680 cw 1900 cw. (for 0855 and 1505 messages only)	0745 1045 1345 0845 1245 0945	S. U.W. U.A.T. S. F. { S. F.	"Météo Holland" (Time G.M.T.) (1-4) [0700] In (Vs) BBDD FwvTt cbwVh ALnH CaddF,s (5, 6) [0700] In (Vs) wwVhL NDDFWs "Pilot" In hddvv hddvv, etc. "Temp" In ddtT BBtTh BBtTh (5, 6) [0820] In (Vs) wwVhL NDDFWs Forecast for London-Amsterdam air, route in English Forecast for Amsterdam-Paris air route in French (2, 5, 6) [0920] In (Vs) wwVhL NDDFWs Revised forecast as for 0845 F message	N.I.C. " " " " p.l. N.I.C.	
0855 1505	— } — }	U.W. U.A.T.	"Pilot" In hddvv hddvv, etc. "Temp" In ddtT BBtTh BBtTh	N.I.C. " "	
1115 2315	0700 } 1800 }	S. S. W. on request	"KNMI" (1-4) BBDD FwvTt (5-8) BBDD FwvTt Followed by storm signal (when necessary) and notice to mariners (in Dutch and English). See Hydrographic Section NOTES (1) No index numbers are transmitted, the above fixed order of stations being adhered to (2) "x" = missing ob. (3) The storm signal gives notice of shifting of centre of storm (4) Messages are sent three times in succession	O.I.C. " p.l.	
0445 on request	0100	F.	Wind and weather forecasts for western part of the Gulf of Mexico (West of long. 90°), eastern part of Gulf of Mexico (east of long. 90°), the Caribbean Sea (west of long. 73°) and for the Wind- ward Passage. Whenever the conditions warrant, forecasts will be preceded by storm or hurricane warnings and warnings re- garding "northers" during the winter months	p.l.	

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission on G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
HONDURAS—continued. Swan Is., US, 2,240 sp.	1730 on request	1300	S. F.	(Sent only during the hurricane season from June to November inclusive) In In BBBDF (Sent daily throughout the year) same forth as 0100 F. message See also under U.S.A., New Orleans	—	will be broadcasted from Swan Island every two hours and on the even hour (90th meridian time)
SYNOPSIS STATIONS SI = Swan BZ = Belize, Honduras BFD = Bluefields, Nicaragua W = Willemstadt, Curaçao SJ = San Juan, Puerto Rico PP = Port au Prince, Haiti CRG = Genesegos, Cuba LFE = La Fé, Cuba KN = Kingston, Jamaica TI = Turks I., Bahamas BBB = Bar. in inches, initial figure omitted D = Wind direction on scale 0-8 F = Beaufort wind force x = Missing ob.						
HONG KONG Cape d'Aguilar, VPS, 600 sp.	0500 0900 0400 (about and repeated every 2 hours	— — —	S. S. W.	A summary of meteorological conditions and forecasts " " " "	p.l. p.l.	If a later storm warning is issued during the day, the later warning will be substituted.
HUNGARY Csepel (near Budapest), HB, 3000, sp.	0920	0600	S.	"Meteor Hongrois" In In BBBDD TWTTC bbbRR MMmm Note.—This bulletin is issued by the Institute of Meteorology and Magnetism, Budapest	O.I.C.	01 Budapest 02 Szombathely 03 Kaposvár 04 Szeged 05 Debreczen SYNOPSIS STATIONS Reykjavik Grimsstadir Vestmanna Hafnarhöf. Isa Floid Holar i Hornafirdi Akureyre Coppenhagen
ICELAND Reykjavik	1000 on week days.	0800	S.	(Stations in order given in list) (First 6 stations only) TTDFv BBbW (all other stations) BBbW followed by short summary of weather conditions especially direction and force of wind during following 12 hours in S.E.	N.I.C. (ined.) p.l.	

INSTRUCTIONS.—(1) D = N, etc.]
 (2) v = Sky condition at time of ob.
 (3) b = bar. change in last 3 hours
 (4) W = condition of sky during period since previous message as for v (Note 2).
 (5) Temperature in degrees C Bar. in mm.
 (6) A hyphen replaces missing figures. If a station is missing the word "Vantar" (missing) is inserted in its place in the message. If a foreign station is omitted, a neighbouring station will be put in its place without any comment if the weather is likely to be similar at that place

(2) v = Sky condition at time of ob.

- Code
- 0 = blue sky
 - 1 = clouded
 - 2 = mist
 - 3 = drizzle
 - 4 = rain
 - (3) b = bar. change in last 3 hours

Code

- 0 = very little change
- 1 = bar. rising
- 2 = bar. rising quickly
- 6 = bar. falling
- 7 = bar. falling quickly

- (4) W = condition of sky during period since previous message as for v (Note 2).
 (5) Temperature in degrees C Bar. in mm.
 (6) A hyphen replaces missing figures. If a station is missing the word "Vantar" (missing) is inserted in its place in the message. If a foreign station is omitted, a neighbouring station will be put in its place without any comment if the weather is likely to be similar at that place

ITALY

Rome, IDO, 11,000 cw.

0930

0700

S.

2045

1800

U.W.
S.

Same as 0930 U.W. message

Note.—(1) "★" is used to denote missing information
 (2) U.W. are reported at six heights, i.e., 500 m., 1000 m., 1,500 m., 2,000 m., 3,000 m., 4,000 m., above m.s.l.

STATIONS

- 01 Turin
- 02 Milan
- 04 Padua
- 06 Genoa
- 07 Florence
- 08 Leghorn
- 09 Ancona
- 11 Rome
- 12 Maddalena
- 13 Naples
- 14 Brindisi
- 16 Messina
- 18 Vittoria
- 19 Taranto
- 20 Venice

O.I.C.
(mod.)
special
O.I.C.
(mod.)
special

SYNOPTIC.
F = force of S. wind.
Code No.,
Beaufort No.

- 0 = 0 or 1
- 1 = 2
- 2 = 3
- 3 = 4
- 4 = 5
- 5 = 6
- 6 = 7
- 7 = 8
- 8 = 9
- 9 = 10, 11 or 12

V = speed of U.W.
Code No.,
Speed in m/sec.
from 0 to 1

- 0 = 1
- 1 = 3
- 2 = 5
- 3 = 7
- 4 = 9
- 5 = 11
- 6 = 13
- 7 = 15
- 8 = 17
- 9 = above 17

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Note..
ITALY—continued. Centocelle (Rome), ICD, 2,250 sp.	0930 2045	0700 1800	—	Times and codes as for Rome (above)	—	D = Direction of U.W. Code to. Direction. 1 = N. 2 = N.E. 3 = E. 4 = S.E. 5 = S.W. 6 = W. 7 = W.W. 8 = N.W.
JAMAICA Christiania, BZQ, 1,200	0100 1300	—	—	Station closed June, 1922	—	
JAPAN Kikurum (Ke-lung), JFK, 600 sp.	1130 on request	—	S.W.	"QST QST QST" weather report followed by storm warning .. The messages are sent out in English and are transmitted three times in succession, each being preceded by the signal QST sent three times	p.l. English	Also transmits the warnings issued by the Central Meteorological Ob. at Tokyo, immediately after receipt
Choshi, JCS, 600 sp. ..	1200 following T.S. on request	—	S.W.	The warnings contain the following: Typhoon or low atmospheric pressure, date, time, position of centre, reading of barometer at centre, and direction of pro- gressive motion; or Locality, warning, and remarks		No charge is made, except when sent especially at the request of ships
Dairenwan (Kwang- Tung), JDA, 600 sp.	1200 on request	—	S.W.			
LATVIA Libau (Liepaja), KCB, 1,200 sp. Riga, KCA, 600 sp. ..	0755 1100	0700 } —	S. I W.	In BBDD FWTH #BBRR MMmmW" followed by ice report (see Hydrographic section) Storm (gale) warnings for the Baltic Sea in English	O.I.C. (mod.) p.l.	H = Relative humidity in N.I.C. W = Past weather in Nauen Code 0900 message Ob, made at Riga stations: 01 Riga 02 Libau 03 Malnova 04 Dwinsk

hours (except between 2100 and 0300) during the probable continuance of the cyclone.

If the warning signal only is sent out it will indicate, in the absence of precise information, that there is reason to expect the passage of a cyclone

ately by Zaudzi and Majunga station in the case of a cyclone affecting the region to the north-west of Madagascar or the Mozambique Channel, and alternately by the Zaudzi and Diego Suarez stations in the case of a cyclone affecting the regions to the north-east and east of Madagascar.

During the whole of this service the three stations will remain on the watch, outside the regular hours of working, during the first quarter of each hour, except between 2115 and 0300

MALTA

Rinella, BYZ 4,200 cw.

0900
2100

MEXICO

Mazatlan de Sinaloa, XAE
Salina Cruz, XAN
Payo Obispo, XAC
Campeche, XAB
Vera Cruz, XAA
* 600 sp.

1837

MOROCCO

Médiouna, CNM,
5,000 cw.

0845

Casablanca, CNP,
1,800 sp.

1300
1800

Casablanca, CNP,
600 sp.

0945
1615

when necessary

NEWFOUNDLAND AND LABRADOR

Cape Race, VCE, 600 sp.

0215
1415

on request

Point Amour, VCL
Point Ritch, VCH
Belle Isle, VCM, 600 sp.

0230
1430

on request

"Météo Rabat"

In In BBBDD FWTT 8bbu
(3 stations) In In D₁V₁D₂V₂D₃V₃ D₄V₄D₅V₅D₆V₆

In In BBBDD FWTT 8bb
In In BBBDD FWTT 8bb

(These messages are repeated at 0900, 1445, 2000 from Oran, q.v.)
Weather report *en clair*, giving particulars of ob. at Moroccan ports
(For the following day)

S.
U.W.

0700

S.
F.
W.

1300
1800
0700

when necessary

SYNOPTIC STATIONS:

- 01 Tangier
- 03 Rabat
- 04 Casablanca
- 07 Agadir
- 09 Mequinez
- 12 Taza
- 15 Bu-denib

O.I.C.

Eiffel Tower

Wind

O.I.C.

O.I.C.

p.l.

p.l.

On exceptional occasions (*i.e.*, when a gale is anticipated) forecasts are issued on a wavelength of 600 m. spark

(Compiled by the Canadian Meteorological Service, Toronto)

(Compiled by the Canadian Meteorological Service, Toronto)

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of report G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
NEW GUNEA Port Moresby, VIG ..	—	—	F.	—	—	—
	when requested by ships or when necessary					
NEW ZEALAND Awani, VLA, 600 sp. Wellington, VLV, 600 sp. Chatham Is., VLC	1030 0930 —	— — —	F. F. —	— — —	— — —	— — —
						Not sent on Saturday or Sunday unless the conditions are exceptional.
NORWAY Christiana, 8,000 cw. mbs.	0750	0700	S.	—	N.I.C.	SYNOPTIC: Fm = max. wind force since time of previous ob. Code figure. Beaufort No. 0 A. 10. 1 .. 11 2 .. 12 3 .. 0 to 3 4 .. 4 5 .. 5 6 .. 6 7 .. 7 8 .. 8 9 .. 9 dsds = ship's course on scale 01-32, 08 = E, 10 = S, etc. S = time of cessation of precipita- tion on same scale as for com- mencement in N.I.C. o = no rain or rain still falling bb = amt. of bar. tendency in ½ mbs. during preceding 3 hrs.

"Météo Norvègien"

(00) InIn BBBDD FwvTT cbWVH ALANh RRmmr CddVV
(12, 50) InIn BBBDD FwvTT cbWVH ALANh RRSVsr CddVV
(Other stations) InIn BBBDD FwvTT cbWVH ALANh RRSVsr
"Pilot" (97, 98, 99) InIn hddrv hddrv, etc.
PQLLL ILGG BBBDDF wwVkd ALANFm dsdsrW TTTHc bbit

U.W.
O.

(12, 50, 90) InIn BBBDD FwvTT cbWVH ALANh CddVV
(Other stations) InIn BBBDD FwvTT cbWVH ALANh
As 0750 message
As 0750 message
(90) InIn BBBDD FwvTT cbWVH ALANh RR--r CddVV
(12, 50) as 0750 message
(Other stations) as 0750 message
(Other stations) as 0750 message
As 0750 message
As 0750 message

U.W.
O.S.

U.W.
O.

S.

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U.W.
O.

S.

600, 1600 600, 1600	1370 1300 1800 As necessary.	W. W.	The signal is prefixed by the letters CQ, followed by the name of the area threatened and the warning "Polar Front" report	Special	—
600, 1000, 1600 Bergen, LGN, 600 2400 cw.	0955 2035 0700 1800	S.			
PACIFIC ISLANDS Fapete (Tahiti), FOP, 600 sp.	1100 2300	S. W.	"Tahiti observatoire" BBBDD FW ₁ "Tahiti III" followed by advice of cyclones, typhoons, etc. NOTE.—(1) Missing figures are replaced by "x" (2) The safety signal (III) will be transmitted at the times stated, or at any hour of the day or night, repeated at short intervals ten times on full power	O.I.C. p.l.	Reports are transmitted three times in succession, the first time rapidly, the second and third times slowly Station: Point Venus (W) Storm warnings repeated three times, with intervals of 10 mins.
PANAMA Colon, NAX, 1,500 Balboa, NBA, 2,400, 7,000, arc. Cape Mala, NNT, 600 sp.	1000 1800 1000 1800 0100 1300 1700 2100	— — —	— — —	— — —	— — —
PHILIPPINE ISLANDS Kavite, NPO, 952, 5,000 arc.	0300 1400	—	—	—	Follows time signal
POLAND Warsaw, WAR, 2,000 sp.	0300 0900 1500 1300	S. U.W. S. U.W.	"Météo Pologne" InIn BBBDD FCTT 8bb InIn BBBDD FCTT 8bbRR MMmm (for each station) D ₁ D ₁ V ₁ V ₁ D ₂ V ₂ V ₂ D ₂ D ₃ V ₃ V ₃ D ₃ D ₄ V ₄ V ₄ D ₄ D ₄ V ₅ V ₅ D ₅ V ₆ InIn BBBDD FWTT ddb As for 0830 message	N.I.C. N.I.C. Eiffel Tower code N.I.C. Eiffel Tower code	— — — —

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
POLAND—continued. Warsaw, WAR, 2,000 sp.	2000	1800	S.	<p>InIn BBBDD FWTT cbb STATIONS: 01 Posen (L) .. 02 Warsaw (L) .. 03 Vilna (L) .. 04 Lodz (L) .. 05 Lublin (L) .. 06 Cracow (L) .. 07 Tarnow (L) .. 08 Lemberg (L) .. 09 Kielce (L) .. 10 Bromberg (L) .. 11 Zakopane (L) .. 12 Pinsk (L) .. 13 Neufahrwasser (C) .. 14 Oxhöft (C) .. 15 Hela (C) ..</p> <p>.. Rixhöft (C) .. Konitz (L) .. Graudenz (L) .. Thorn (L) .. Teschen (L) .. Przemysl (L) .. Sniatyn (L) .. Rovno (L) .. Luck (L) .. Brest-Litovsk (L) .. Bielowiezch (L) .. Suwalki .. Baranovitschi (L) .. Tourmont (L) .. Bialystok</p>	N.I.C.	
PORTO RICO San Juan, NAU, 2,750	0200 1500	0100 —	S. W.	<p>"USWB" (United States Weather Bureau) InIn (or In), BBBDF .. Hurricane warning .. In the absence of a tropical storm, the words "weather normal" will be sent each day NOTE.—x = missing ob.</p>	American code p.l.	<p>Messages transmitted from June to November only (inclusive)</p> <p>Stations: S.J. San Juan ST. St. Thomas (Virgin Is.) BT. Bassesterre (St. Kitts) RS. Roseau (Dominica) BB. Bridgetown (Barbadoes) SD. Santo Domingo SL. Puerto Plata CA. Castries, St. Lucia LU. Willenstadt, Curaçao W. Port of Spain, Trinidad PS.</p>
PORTUGAL Lisbon, P ^{OL} , 1,000	0800 2000	— —	— —	HH DD $\mu\mu$ DD FF $\mu\mu$..	Special Special	<p>SYNOPTIC. HH = hour of ob. (0—24) DD = Wind direction NN = Wind force (figures repeated twice)</p>
Monsanto, CTV, 1,000	1350 1850	1300 1800	— —	<p>(Station) BBDDx₁ FwwHx₂ cbWVx₃ CNTTx₄ KdGGx₄ _{y₁y₂y₃y₄z} (Station) BBDDx₁ FwwHx₂ cbWVx₃ CNMmx₄ RRSrx₅ KdGGx₅</p>	N.I.C. N.I.C.	<p>SYNOPTIC (Azores Stations) Angra Funchal Ponta Delgada</p>

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob- serv. G.M.T.	Nature or report.	Form of Message.	Code used.	Notes.
SPAIN—continued. Carabanchel (Madrid) EGC, 2,000 sp.	1530	1300	S.	(SF, LC, MA) InIn BBBDD FwTW ₁ TT c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₁ d ₁ u ₁ .. (Other stations) InIn BBBDD FwTW ₁ TT c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₁ d ₁ N ₁ h ₁ .. "Precaution" C ₁ LL GG BB or "Precaution" Gr LL GG BB DD	" Special N.I.C. Special	bb = Amt. of bar. tendency (inbs., and tenths per three hours) C ₁ C ₂ = Forms of cloud to which d ₁ and d ₂ refer d ₃ = Direction of motion for high cloud Nh = Cloudiness of horizon. d ₁ d ₁ = Direction of U.W. v ₁ v ₁ = Speed of U.W. d ₁ = Direction of motion of low cloud u = Sea disturbance (O.I.C.) suffixes for d ₁ d ₁ and v ₁ v ₁ 1 = 250 m. 2 = 500 " 3 = 1000 " 4 = 2000 " 5 = 3000 "
	2030	1800	S.	Same form as 1000 (S) (no upper wind report) Notes—(1) "x" is inserted in place of missing ob. (2) If a complete set of ob. is missing the word "falta" is transmitted after the index letters of the station Stations: or MD Madrid 09 BD Badajoz 02 LC Coruna 10 CD Cordova 03 SF San Fernando 11 AL Alicante 04 BA Barcelona 12 AL Almeria 05 SA Santander 13 ME Melilla 06 VD Valladolid 14 TE Tetuan 07 ZA Saragossa 15 IZ Izana 08 MA Mahon (Teneriffe).		
				(W).—Special Code. The storm warning is preceded by the word "precaution," followed by either the letters Ci (indicating cyclonic depression) or Gr (indicating a squall). Where LL = lat. in degrees of the centre of the depression, GG = longitude (50 is added to the number for longitudes east of Greenwich) of the centre of the depression, BB = barometer in mb.; DD = direction in which squall is proceeding (scale 0-32).		
SWEDEN Karlsborg, SAJ, 4,200 CW.	0740	0700	S.	"Méteo Suede" (03) InIn BBBDD FwTT c ₁ bWVH ALANh RRmmr C ₁ ddVV .. (Other stations—inland) InIn BBBDD FwTT c ₁ bWVH ALANh RRmmr (Other stations—coastal) InIn BBBDD FwTT c ₁ bWVH ALANh RRmmr "Pilot" (03, 22, 32) InIn h ₁ ddvv h ₁ ddvv, etc. (03) InIn BBBDD FwTT c ₁ bWVH ALANh C ₁ ddVV .. (Other stations) InIn BBBDD FwTT c ₁ bWVH ALANh As for 0740 (S) message As for 0740 (S) message Note.—(1) Stations in capital letters alone are transmitted unusually. Should not be mistaken above stations from this list	N.I.C. (mod.) " " " " " " "	SYNOPTIC: VV. Speed given in metres per s. c. 01 Karesuando (L) 02 Riksgränsen (L) 03 ABISKO (L) 04 Kiruna (L) 05 Storvåjare (L) 07 Gällivare (L) 09 Jockmörk (L) 11 HAIARANDA (L) 14 Pitea (L) 15 STENSELE (L)
	1340	1300	U.W.			
	1840	1800	U.W.			

Charge: 6.25 fr. or 9.37 fr. per special enquiry
Navigation reports also supplied

request

Vaxholm, SAF
Gottland, SAE
Karlskrona, SAA
Göteborg, SAB
Härnösand, SAH
(All 600 sp.)

Karlsborg (Stockholm),
SAJ, 2,500 cw.

1215

0700

S.

S.

F.

W.

"Weather report"

(Station). BBBDD FVTTT

Bar. pressure and changes for Europe are sent *en clair* (English)

"Forecasts," ddynt

"Gale warning" *gigagagds*

NOTE (1). dd = Wind direction according to following code :

Wind.	Direction between—							
	N.-E.	N.	E.-S.	SE.	SW.	S.-W.	W.-N.	Var- able.
Light	01	06	11	16	21	26	31	36
Moderate	02	07	12	17	22	27	32	37
Fresh	03	08	13	18	23	28	33	38
Strong	04	09	14	19	24	29	34	39
Storm	05	10	15	20	25	30	35	40
								45

N.I.C.

(mod.)

p.l.

Special

code

Note (1)

Note (2)

- 25 Sveg (L)
- 26 Björnsör
- 27 SARNÄ (L)
- 28 SARNÄ (L)
- 29 Gävle (L)
- 30 Falun (L)
- 31 Gustafsors (L)
- 32 Upsala (L)
- 33 Västera (L)
- 34 KARLSTAD (L)
- 35 STOCKHOLM (L)
- 36 Örebro (L)
- 37 Strömstad (L)
- 38 Askersund (L)
- 39 Nyköping (L)
- 40 Linköping (L)
- 41 Skara (L)
- 42 Vänersborg (L)
- 43 Ulricehamna (L)
- 44 JONKÖPING (L)
- 45 Västervik (L)
- 46 Borås (L)
- 47 Göteborg (L)
- 48 WISBY (C)
- 49 Växjö (L)
- 50 Hamstad (C)
- 51 KALMAR (C)
- 52 Karlshamn (C)
- 53 Kristianstad (L)
- 54 Lund (L)
- 55 Malmö (L)
- 56 Björklubb (C)
- 57 OlandsNorra Udde
- 58 SYNOPSIS issued by the Statens Meteorologisk-Hydrografska Anstalt (Stockholm)
- 59 v = State of the sky or weather
- 60 = W in O.I.C.
- 61 Station.
- 62 R = Rost
- 63 K = Kinn
- 64 U = Utsire
- 65 Hm = Hansholm
- 66 V = Vinga
- 67 Hs = Hammershus (Bornholm)
- 68 G = Gotska Sandön
- 69 B = Bremö

Forecasts refer to the following areas :—

N = Eastern portion of North Sea

V = West Coast of Sweden

Oc = Baltic

B = Gulf of Bothnia

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission on G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
SWEDEN—continued				<p>oo = Very light wind or calm as follows:</p> <p>y = Forecast of alteration in the direction or force of the wind, as follows:</p> <p>0—No change. 1—Unchanged. 2—Increasing. 3—Decreasing. 4—Shifting to the right. 5—Shifting to the left. 6—Gradually increasing. 7—Gradually decreasing. 8—Gradually shifting to the right. 9—Gradually shifting to the left.</p> <p>n = Forecast regarding rain, as follows:</p> <p>0—Unchanging weather. 1—None or little rain. 2—Rain in some places. 3—Rain in several places. 4—Rain at most places. 5—Rain everywhere. 6—Showers in most places (snow squalls in winter). 7—Showers in several places (snow in winter). 8—Showers in some places (snow in winter). 9—Fog probable.</p> <p>"t" = Forecast regarding changes in temperature, according to the following scale:</p> <p>0—Unchanged 1—Rising 2—Gradually rising 3—Falling 4—Gradually falling 5—About mean tem- perature "x" = No information</p> <p>NOTE (2). Scale for (g)</p> <p>0—No storm warning 1—Gale (7-10 Beaufort) from a direction between north and west 2—Gale (7-10 Beaufort) from a direction between south and west 3—Gale (7-10 Beaufort) from a direction between north and east 4—Gale (7-10 Beaufort) from a direction between south and east 5—Gale (7-10 Beaufort) without given direction 6—Storm (11-12 Beaufort) from a direction between north and west 7—Storm (11-12 Beaufort) from a direction between south and west 8—Storm (11-12 Beaufort) from a direction between north and east</p>		<p>Districts for storm warnings:</p> <p>First symbol concerns the Skager- rak Second symbol concerns the Katteg- gat Third symbol concerns the southern part of the Baltic Fourth symbol concerns the nor- thern part of the Baltic Fifth symbol concerns the Gulf of Bothnia Storm warnings are valid until 0700 G.M.T. of the following day</p>

Region for Storm Warning	Station	Time	Frequency	Message	Remarks
Vaxholm, SAF, 600	W.	2200	—	—	—
	W.	1650	—	—	—
	W.	2150	—	—	—
	W.	1655	—	—	—
Hamösand, SAH, 600	W.	2155	—	—	—
	W.	2155	—	—	—
TONGA Nukualofa, USB	F.	On request.	—	—	—
TUNIS Bizerta (Sidi-Abdallah), FUA, 5,150 cw, 1,350 sp. for 1200 message	S.	0315	0100	" Météo Afrique "	(61 only). BBBD FwT Bbb
	S.	0920	0700	In BBBD FwT V bbbRR Mmmu	Repeat of 0900 message from Oran (see above—Algeria)
	U.W.	0920	0700	D ₁ V ₂ D ₂ V ₂ D ₂ V ₂ D ₂ V ₂	Repeat of 0900 message from Oran
	S.U.W.	1520 2020	1300 1800	In BBBD FwT bbb	Repeat of 1445 and 2000 messages respectively from Oran (See above).
TURKEY Constantinople, IQK, 3,000 cw.	S. F.	1200	0700	" Météo Alger "	Repeat of 1145 message from Oran (Algeria), with addition of ob. at remaining six stations.
	S. F.	0800	—	The Italian station transmits a local bulletin.	—
U.S.A. Atlantic Coast and Great Lakes	—	—	—	—	—
	—	—	—	—	—
Great Lakes (Naval Radio Station), NAL, 1,988 sp.	S.	0430 (evening bulletin)	0100	" USWB " (United States Weather Bureau)	In or In In BBBD FwT bWAC
	U.W. F.	—	—	—	—
(From 15 April to 20 Dec. inclusive)	—	—	—	—	—

EDmonton, Alberta
KAmlloops, B.C.
CYalgary, Alberta
SCwift Current, Sask.
PRince Rupert, B.C.

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
U.S.A.—continued Chicago, NUR, 700 sp.	0400	0100	F.S.W.	Wind and weather forecasts and storm warnings for Lake Michigan; advisory messages relating to storm warnings issued for the Great Lakes; and 0100 ob. of barometric pressure, wind direction and velocity and state of weather at Milwaukee, Grand Haven and Chicago	p.l.	
	1600	1300	F.S.W.	Wind and weather forecasts and storm warnings for Lake Michigan; advisory messages relating to storm warnings issued for the Great Lakes and 1300 ob. of wind direction and velocity and state of weather at Beaver Is., Plum Is., Mackinaw and Chicago (bar. pressure for Chicago included)	p.l.	
Cleveland, NRH, 1,080 sp. ..	0400 1600	—	F.S.W. F.S.W.	Wind and weather forecasts and storm warnings for Lake Erie; advisory messages relating to storm warnings issued for the Great Lakes; and barometric pressure, wind direction and velocity, and state of weather at Toledo, Cleveland and Erie	p.l. Ameri- can	
Duluth, NUX, 1,200 sp.	0345 1545	—	F.S.W. F.S.W.	Wind and weather forecasts and storm warnings for Lake Erie; advisory messages relating to storm warnings issued for the Great Lakes; and barometric pressure, wind direction and velocity, and state of weather at Toledo, Cleveland and Erie	"	
Eureka (California), NPW, 2,050 sp.	0130 1700	0100 1300	S.W. F.S. W.	F = Wind and weather forecasts and storm warnings for California coast north of San Francisco; and Sault Ste. Marie (barometric pressure at Duluth and Portage, Whitefish, and Sault Ste. Marie included) S = Barometric pressure, wind direction and velocity and state warnings for north Pacific Coast W = At 1700: storm warnings for coast of California north of San Francisco, and advices concerning storm warnings for North Pacific coast	p.l. Ameri- can	These messages are also issued on request
Galveston, NKB, 1,813 sp.	1630 2300	—	—	—	—	—
Miami, NGE, 1,620 sp.	1630 2300	—	—	—	—	—
New Orleans, NAT, 1,832 sp.	1600 2200	—	—	—	—	—
New York, NAH, 1,832 sp.	1530 2200	—	—	—	—	—
Norfolk, NAM, 1,851 sp. (507 sp. and cw. for	0100 0130*	—	—	—	—	—

2,700 sp.	0430 0530 1330 1730 2130	F.S.W. F. S. S.W. S.W.	High and low water advises concerning storm warnings issued for North Pacific Coast S = Current bar pressure, wind direction and velocity and state of weather at North Head W = Storm warnings for the coasts of Washington and Oregon and Columbia River entrance, followed by advices concerning storm warnings issued for the North Pacific Coast	Ameri- can p.l.	
Pensacola, NAS, 2,250 sp.	1645 2300	—	—	—	—
Philadelphia, NAL, 1,948 sp.	1545 2200	—	—	—	—
Point Isabel, NAY, 5,000 cw.	0000 0500 1700 0100 1700	S.W. " " —	—	—	—
Portland, NAB, 1,620 sp.	—	—	—	—	—
San Diego, NPL, 1,988 sp.	—	—	—	—	—
San Juan, NAU, 5,200 cw.	0200	—	—	—	—
San Pedro, NPX, 1,851 sp.	0430 1630	F.S. W. F.S. W.	F = Wind and weather forecasts and storm warnings for California coast, south of San Francisco; advices concerning storm warnings issued for California coast S = Barometric pressure, wind direction and velocity and state of weather at San Pedro (1300 ob. only), San Francisco and San Diego (1300 and 0100 ob.) W = Storm warnings for the coast of California south of San Francisco and advices concerning storm warnings for the coast of California	p.l. Ameri- can	Storm warnings are also trans- mitted on request
Savannah, NEV, 1,813 sp.	1600 2300	—	—	—	—
St. Augustine, NAP, 1,851 sp.	0000 1630	—	—	—	—
St. Petersburg, NGL, 2,700 sp.	0000 1030	—	—	—	—
Tatoosh, NPD, 1,654 sp.	0100 0400 1300 1700 2100	S.W. F.S.W. S. F.S.W. S.W.	F = Wind and weather forecasts and storm warnings for Wash- ington coast and Puget Sound; advices concerning storm warnings issued for North Pacific coast S = Current barometric pressure, wind direction and velocity, and state of weather at Tatoosh Island W = Storm warnings for coast of Washington and Puget Sound, followed by advices concerning storm warnings for the North Pacific Coast Weather report for Columbia, Maryland, Virginia, Pennsylvania and Ohio	p.l. Ameri- can	These reports are also issued on request
Washington, D.C., WWX (except Sundays and holidays)	1000 2150	—	—	—	—

Meteorological Transmissions—Continued

Country, Station, Call, Wavelength,	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of report.	Form of Message.	Code used.	Notes.
URUGUAY Carrito (Monte Video), CWA, 600	2200	—	—	The station sends out each day (Sundays excepted) between 2200 and 2300, a bulletin from the National Meteorological Institute containing the following information:— (a) The situation of the centres of atmospheric action in the southern part of the continent, <i>i.e.</i> , in the zone from latitude 22° to the extreme south (b) The observations made at 1220 by the Central Observatory, Montevideo, and by the National Service stations (c) The more important variations observed from 1220 to 2100 In transmitting the bulletin the International Code is employed		
VIRGIN ISLANDS St. Croix, NNI, 450 .. St. Thomas, NBB, 1,688	—	—	W. W.	Hurricane warnings and advisory messages relating thereto are transmitted when issued by the San Juan weather Bureau, and repeated every four hours	p.l.	
WINDWARD PASSAGE Navassa, NKC, 600 sp.	on request	—	Bar. readings correct- ed to sea level			

TIME SIGNALS.

INTRODUCTION

AS the practical outcome of efforts made by the French *Bureau des Longitudes*, a time signal service was established in 1909. Signals were first transmitted twice daily by the radiotelegraphic station at the Eiffel Tower, and were primarily intended for navigation purposes. Shortly afterwards the German wireless station at Norddeich established a time service, using a different code from that employed in the Paris transmissions. The practical value of these two services in relation to navigation, having been amply demonstrated, a conference was called in 1912 to consider the whole question and to devise an International Code for transmission. Accordingly a new system was drawn up and was first employed on July 1st, 1913, by the Eiffel Tower. This system, known as the International system, is still used by this station daily at 0923 G.M.T., and by other stations in different parts of the world. The original system, generally known as the French system, is, however, still used by the Eiffel Tower daily at 1044 and 2244 G.M.T.

Most of the time signals at present transmitted are sent by means of an automatic arrangement set in motion by the pendulum of a standard clock at the local astronomical observatory. In some cases the whole of the time signal is thus automatically controlled, and in other cases part is sent by hand by an operator, and the other part (which alone can be relied upon as accurate) by a pendulum. Either of these systems give G.M.T. with an accuracy of about $\frac{1}{4}$ sec. for a practised observer, but under the most favourable conditions and by employing a self-registering method of reception, a maximum accuracy of about $\frac{1}{100}$ sec. is attainable.

There are, however, many stations in the world which are very suitably situated geographically for transmitting time signals to ships (which could not otherwise receive), where it would be difficult or impossible to establish an automatic system. In such cases signals sent entirely by hand may be provided, but the accuracy of these signals is doubtful, and must not be trusted to within one or two seconds of time. The signals are intended to enable navigators to set their chronometers while at sea at least once a day to standard G.M.T. (or prime meridian time), thus entirely eliminating errors of rate among the individual chronometers on board ship or reducing such errors to a minimum. They are of great value when approaching shore or in danger of ice, while they are of sufficient accuracy for most of the ordinary time-keeping purposes of everyday life such as regulating town and railway clocks.

It is to be hoped that wireless time signals will eventually be standardised so that there shall be only two kinds of ordinary time signals transmitted: the automatic signals being all alike and quite distinctive from those sent by hand. It is further expected that arrangements will be made for all time signals to be transmitted at times so selected that a ship with only one wireless operator on board will be able to pick up these messages.

In the following pages will be found the current arrangements for the transmission of time signals throughout the world. The International system, the old French system and the system known as the American code are set out in chart form at the beginning of the tabulated information for the sake of easy reference.

SCIENTIFIC TIME SIGNALS OR RHYTHMIC BEATS

Rhythmic signals are sent out regularly by Paris (Eiffel Tower), Lyons, Bordeaux and other stations, and consist of a series of 300 dots, each formed of a single spark, the 60th, 120th, 180th and 240th dot being suppressed in order to establish the indication for counting purposes. They are automatically transmitted by a pendulum so adjusted that it beats $\frac{49}{50}$ second intervals. These signals, when brought together for comparison with the local time apparatus, serve the purpose of a time vernier, a reading being made on beats which are coincident (or as nearly so as possible). This series of

rhythmic beats is heard at the Paris Observatory, and compared with the tickings of the Observatory standard clock.

The exact times of the 1st and 300th beats are then calculated at the Observatory to the nearest 1/100th second, and are transmitted by the Eiffel Tower station in the form of a "correction group" later the same day. The accuracy of the method depends upon the spacing and the number of coincidences. The limit of accuracy is reached when it becomes difficult to judge the coincidences. With the present system of rhythmic beats spaced at intervals of 49/50 sidereal second,* an accuracy of 1/100th second is attainable using ear methods of comparison, and with self-registering apparatus an accuracy of the order 1/1000 seconds.

PROCEDURE ADOPTED IN SENDING SCIENTIFIC OR VERNIER SIGNALS.

1. *Preliminary Tuning Signals.*—During the first minute a series of trial signals are sent thus:

• • • • • etc.

Then, for 50 seconds, a series of calls — • — • — • — • — etc., followed by 10 seconds silence.

(2) *The rhythmic beats* are sent during the next five minutes:—

A series of 300 dots are transmitted, the spacing between successive dots being one beat of a clock so adjusted as to beat 50 times in 49 seconds (Greenwich Sidereal Time) = 49/50 seconds sidereal time = 44/45 seconds mean time approximately. In this series of 300 dots the 60th, 120th, 180th and 240th dots are suppressed in order to establish the indication for counting purposes.

3. *Corrections.*—The corrected times of the first and last dots are transmitted later the same day by the Eiffel Tower Station immediately before the commencement of the ordinary semi-automatic T.S. at 1045 and 2245 (G.M.T.), as follows:—

Two groups of six figures each sent three times in succession and separated by the "break signal."

Example:

"Temps sidéral"	— • • • —	302653	351971
	— • • • —	302653	351971
	— • • • —	302653	351971
		h.	m.

Signalled time of last dot	..	10	35	19.71
" " first dot	..	10	30	26.53

Time of whole series (difference)	=	—	4	53.18
	=	293.18	seconds.	

Average interval between any two dots	=	$\frac{293.18}{299}$	sec.
	=	.9805	sec.

* A more detailed explanation of "sidereal time" will be found in *The Wireless World and Radio Review*, Jan. 13, 1922, pp. 501-504.

NOTE.—As reference is made in this section to "Sidereal Time" the following explanation may be of use to readers:—

The celestial sphere apparently revolves once per day. As all time is measured by regularly recurring phenomena, the interval between two successive returns to a fixed point of this celestial sphere is called a sidereal day. Sidereal time is reckoned from the time when the first point of the constellation Aries passes the meridian.

Our ordinary affairs, however, are regulated by the solar day, which is the interval between two successive transits of the sun's centre over the meridian. If the orbit were not inclined to the equator, and the earth throughout its orbit not in any way influenced by other planets, the intervals between the two transits would be perfectly regular.

However, for reasons which can easily be discovered by the study of astronomical text-books, the intervals between these transits are not regular, and therefore an imaginary "mean sun" is used in astronomical calculations so that the length of the conventional solar day may be kept uniform. This "mean sun" may be supposed to move with uniform velocity, completing its circuit in the same time as the real sun. When the imaginary sun is on the meridian it is the "mean noon" and when the real sun is on the meridian it is "apparent noon."

The solar day is about four minutes longer than the sidereal day for the sun appears to move eastward among the stars at the rate of about one degree a day. About March 21st the solar clock agrees with the sidereal clock, but the sidereal clock gains nearly four minutes every day. At other times there will be considerable differences between the two clocks.

It should be noted that while the sending clock is kept adjusted so as to gain about 1 second in 50, this rate may vary slightly from day to day, and consequently the interval between two dots should invariably be calculated for any particular series from the signalled times of the first and last dots. In practice it will be found better and less confusing to record the chronometer time of every other coincidence, *i.e.*, those occurring at the whole seconds, disregarding those at half-seconds. In this manner, as a rule, six coincidences in every complete series of 300 dots should be obtained at intervals of about 50 seconds apart. Also, since the rate of a chronometer may have an appreciable effect on the results (a chronometer with a rate of six seconds a day would alter its error over 0.02 second during the series of 300 dots), the most accurate value will be obtained by using the first three coincidences to obtain the mean error at the time of the first dot, the last three to obtain it at the time of the last dot, and then by taking the mean of the two errors and their corresponding times :—

(1) Chronometer time of coincidences (at whole sec.).	(2) Number of dot at which coincidences occurred.	(3) Number of intervals between first dot and coincidence.	(4) Col. 3 multiplied by 0.9805 sec.	(5) Chronometer time of first dot (<i>i.e.</i> , Col. 1 minus Col. 4).
h. m. s.			sec.	h. m. s.
10 27 28	42	41	40.201	10 26 47.799
10 28 18	94	93	91.187	10 26 46.813
10 29 10	146	145	142.173	10 26 47.827
		Number of intervals between last dot and coincidence.		Chronometer time of last dot (<i>i.e.</i> , Col. 1 plus Col. 4).
10 30 00	197	103	100.992	10 31 40.992
10 30 50	248	52	50.986	10 31 40.986
10 31 40	299	1	0.981	10 31 40.981

	First three values.	Last three values.
	h. m. s.	h. m. s.
Chronometer time of $\frac{\text{first}}{\text{last}}$ dot ..	10 26 47.48	10 31 40.99
Signalled time of $\frac{\text{first}}{\text{last}}$ dot ..	10 30 26.53	10 35 19.71
Error by $\frac{\text{first}}{\text{last}}$ three coincidences	— 3 39.05	— 3 38.72

Mean error .. = — 3 38.89

Chronometer is 3 m. 38.89 s. slow on signalled time.

The times given above are Greenwich Sidereal Time; for converting these values to G.M.T. see tables on following pages:

TABLES FOR CONVERTING INTERVALS OF MEAN SOLAR TIME INTO EQUIVALENT INTERVALS OF SIDEREAL TIME.

HOURS.			MINUTES.				SECONDS.						
Hours of Mean Time.	Equivalents in Sidereal Time.			Minutes of Mean Time.	Equivalents in Sidereal Time.			Seconds of Mean Time.	Equivalents in Sidereal Time.				
	h	m	s		m	s		m	s		s		
1	1	0	9 ^h 56 ^s 5	1	1	0 ^h 16 ^s 43	31	31	5 ^h 09 ^s 25	1	1 ^h 00 ^s 27	31	31 ^h 08 ^s 49
2	2	0	19 ^h 71 ^s 30	2	2	0 ^h 32 ^s 86	32	32	5 ^h 25 ^s 68	2	2 ^h 00 ^s 55	32	32 ^h 08 ^s 76
3	3	0	29 ^h 56 ^s 94	3	3	0 ^h 49 ^s 28	33	33	5 ^h 42 ^s 11	3	3 ^h 00 ^s 72	33	33 ^h 09 ^s 04
4	4	0	39 ^h 42 ^s 59	4	4	0 ^h 65 ^s 71	34	34	5 ^h 58 ^s 53	4	4 ^h 01 ^s 10	34	34 ^h 09 ^s 31
5	5	0	49 ^h 28 ^s 24	5	5	0 ^h 82 ^s 14	35	35	5 ^h 74 ^s 96	5	5 ^h 01 ^s 37	35	35 ^h 09 ^s 58
6	6	0	59 ^h 13 ^s 88	6	6	0 ^h 98 ^s 57	36	36	5 ^h 91 ^s 39	6	6 ^h 01 ^s 64	36	36 ^h 09 ^s 86
7	7	1	8 ^h 99 ^s 53	7	7	1 ^h 14 ^s 99	37	37	6 ^h 07 ^s 82	7	7 ^h 01 ^s 92	37	37 ^h 10 ^s 13
8	8	1	18 ^h 85 ^s 18	8	8	1 ^h 31 ^s 42	38	38	6 ^h 24 ^s 24	8	8 ^h 02 ^s 19	38	38 ^h 10 ^s 40
9	9	1	28 ^h 70 ^s 83	9	9	1 ^h 47 ^s 85	39	39	6 ^h 40 ^s 67	9	9 ^h 02 ^s 46	39	39 ^h 10 ^s 68
10	10	1	38 ^h 56 ^s 47	10	10	1 ^h 64 ^s 28	40	40	6 ^h 57 ^s 10	10	10 ^h 02 ^s 74	40	40 ^h 10 ^s 95
11	11	1	48 ^h 42 ^s 12	11	11	1 ^h 80 ^s 70	41	41	6 ^h 73 ^s 53	11	11 ^h 03 ^s 01	41	41 ^h 11 ^s 23
12	12	1	58 ^h 27 ^s 77	12	12	1 ^h 97 ^s 13	42	42	6 ^h 89 ^s 95	12	12 ^h 03 ^s 29	42	42 ^h 11 ^s 50
13	13	2	8 ^h 13 ^s 42	13	13	2 ^h 13 ^s 56	43	43	7 ^h 06 ^s 38	13	13 ^h 03 ^s 56	43	43 ^h 11 ^s 77
14	14	2	17 ^h 99 ^s 06	14	14	2 ^h 29 ^s 88	44	44	7 ^h 22 ^s 81	14	14 ^h 03 ^s 83	44	44 ^h 12 ^s 05
15	15	2	27 ^h 84 ^s 71	15	15	2 ^h 46 ^s 41	45	45	7 ^h 39 ^s 24	15	15 ^h 04 ^s 11	45	45 ^h 12 ^s 32
16	16	2	37 ^h 70 ^s 36	16	16	2 ^h 62 ^s 84	46	46	7 ^h 55 ^s 66	16	16 ^h 04 ^s 38	46	46 ^h 12 ^s 59
17	17	2	47 ^h 56 ^s 00	17	17	2 ^h 79 ^s 27	47	47	7 ^h 72 ^s 09	17	17 ^h 04 ^s 65	47	47 ^h 12 ^s 87
18	18	2	57 ^h 41 ^s 65	18	18	2 ^h 95 ^s 69	48	48	7 ^h 88 ^s 52	18	18 ^h 04 ^s 93	48	48 ^h 13 ^s 14
19	19	3	7 ^h 27 ^s 30	19	19	3 ^h 12 ^s 12	49	49	8 ^h 04 ^s 95	19	19 ^h 05 ^s 20	49	49 ^h 13 ^s 42
20	20	3	17 ^h 12 ^s 95	20	20	3 ^h 28 ^s 55	50	50	8 ^h 21 ^s 37	20	20 ^h 05 ^s 48	50	50 ^h 13 ^s 69
21	21	3	26 ^h 98 ^s 59	21	21	3 ^h 44 ^s 98	51	51	8 ^h 37 ^s 80	21	21 ^h 05 ^s 75	51	51 ^h 13 ^s 96
22	22	3	36 ^h 84 ^s 24	22	22	3 ^h 61 ^s 40	52	52	8 ^h 54 ^s 23	22	22 ^h 06 ^s 02	52	52 ^h 14 ^s 24
23	23	3	46 ^h 69 ^s 89	23	23	3 ^h 77 ^s 83	53	53	8 ^h 70 ^s 66	23	23 ^h 06 ^s 30	53	53 ^h 14 ^s 51
24	24	3	56 ^h 55 ^s 54	24	24	3 ^h 94 ^s 26	54	54	8 ^h 87 ^s 08	24	24 ^h 06 ^s 57	54	54 ^h 14 ^s 79
				25	25	4 ^h 10 ^s 69	55	55	9 ^h 03 ^s 51	25	25 ^h 06 ^s 85	55	55 ^h 15 ^s 06
				26	26	4 ^h 27 ^s 11	56	56	9 ^h 19 ^s 94	26	26 ^h 07 ^s 12	56	56 ^h 15 ^s 33
				27	27	4 ^h 43 ^s 54	57	57	9 ^h 36 ^s 37	27	27 ^h 07 ^s 39	57	57 ^h 15 ^s 61
				28	28	4 ^h 59 ^s 97	58	58	9 ^h 52 ^s 79	28	28 ^h 07 ^s 67	58	58 ^h 15 ^s 88
				29	29	4 ^h 76 ^s 40	59	59	9 ^h 69 ^s 22	29	29 ^h 07 ^s 94	59	59 ^h 16 ^s 15
				30	30	4 ^h 92 ^s 82	60	60	9 ^h 85 ^s 65	30	30 ^h 08 ^s 21	60	60 ^h 16 ^s 43

FRACTIONS OF A SECOND.

Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.
	s		s		s		s		s
0 ^h 01	0 ^h 01 ^s 003	0 ^h 21	0 ^h 21 ^s 057	0 ^h 41	0 ^h 41 ^s 112	0 ^h 61	0 ^h 61 ^s 167	0 ^h 81	0 ^h 81 ^s 222
0 ^h 02	0 ^h 02 ^s 006	0 ^h 22	0 ^h 22 ^s 060	0 ^h 42	0 ^h 42 ^s 115	0 ^h 62	0 ^h 62 ^s 170	0 ^h 82	0 ^h 82 ^s 225
0 ^h 03	0 ^h 03 ^s 008	0 ^h 23	0 ^h 23 ^s 063	0 ^h 43	0 ^h 43 ^s 118	0 ^h 63	0 ^h 63 ^s 173	0 ^h 83	0 ^h 83 ^s 227
0 ^h 04	0 ^h 04 ^s 011	0 ^h 24	0 ^h 24 ^s 066	0 ^h 44	0 ^h 44 ^s 120	0 ^h 64	0 ^h 64 ^s 175	0 ^h 84	0 ^h 84 ^s 230
0 ^h 05	0 ^h 05 ^s 014	0 ^h 25	0 ^h 25 ^s 068	0 ^h 45	0 ^h 45 ^s 123	0 ^h 65	0 ^h 65 ^s 178	0 ^h 85	0 ^h 85 ^s 233
0 ^h 06	0 ^h 06 ^s 016	0 ^h 26	0 ^h 26 ^s 071	0 ^h 46	0 ^h 46 ^s 126	0 ^h 66	0 ^h 66 ^s 181	0 ^h 86	0 ^h 86 ^s 235
0 ^h 07	0 ^h 07 ^s 019	0 ^h 27	0 ^h 27 ^s 074	0 ^h 47	0 ^h 47 ^s 129	0 ^h 67	0 ^h 67 ^s 183	0 ^h 87	0 ^h 87 ^s 238
0 ^h 08	0 ^h 08 ^s 022	0 ^h 28	0 ^h 28 ^s 077	0 ^h 48	0 ^h 48 ^s 131	0 ^h 68	0 ^h 68 ^s 186	0 ^h 88	0 ^h 88 ^s 241
0 ^h 09	0 ^h 09 ^s 025	0 ^h 29	0 ^h 29 ^s 079	0 ^h 49	0 ^h 49 ^s 134	0 ^h 69	0 ^h 69 ^s 189	0 ^h 89	0 ^h 89 ^s 244
0 ^h 10	0 ^h 10 ^s 027	0 ^h 30	0 ^h 30 ^s 082	0 ^h 50	0 ^h 50 ^s 137	0 ^h 70	0 ^h 70 ^s 192	0 ^h 90	0 ^h 90 ^s 246
0 ^h 11	0 ^h 11 ^s 030	0 ^h 31	0 ^h 31 ^s 085	0 ^h 51	0 ^h 51 ^s 140	0 ^h 71	0 ^h 71 ^s 194	0 ^h 91	0 ^h 91 ^s 249
0 ^h 12	0 ^h 12 ^s 033	0 ^h 32	0 ^h 32 ^s 088	0 ^h 52	0 ^h 52 ^s 142	0 ^h 72	0 ^h 72 ^s 197	0 ^h 92	0 ^h 92 ^s 252
0 ^h 13	0 ^h 13 ^s 036	0 ^h 33	0 ^h 33 ^s 090	0 ^h 53	0 ^h 53 ^s 145	0 ^h 73	0 ^h 73 ^s 200	0 ^h 93	0 ^h 93 ^s 255
0 ^h 14	0 ^h 14 ^s 038	0 ^h 34	0 ^h 34 ^s 093	0 ^h 54	0 ^h 54 ^s 148	0 ^h 74	0 ^h 74 ^s 203	0 ^h 94	0 ^h 94 ^s 257
0 ^h 15	0 ^h 15 ^s 041	0 ^h 35	0 ^h 35 ^s 096	0 ^h 55	0 ^h 55 ^s 151	0 ^h 75	0 ^h 75 ^s 205	0 ^h 95	0 ^h 95 ^s 260

0:16	0:16044	0:36	0:36099	0:56	0:56153	0:76	0:76208	0:96	0:96263
0:17	0:17047	0:37	0:37101	0:57	0:57156	0:77	0:77211	0:97	0:97266
0:18	0:18049	0:38	0:38104	0:58	0:58159	0:78	0:78214	0:98	0:98268
0:19	0:19052	0:39	0:39107	0:59	0:59162	0:79	0:79216	0:99	0:99271
0:20	0:20055	0:40	0:40110	0:60	0:60164	0:80	0:80219	1:00	1:00274

EXAMPLE.—To convert 2h 25m 18.96s Mean Time at Greenwich, January 20th, 1922, into Sidereal Time. h. m.

For Mean Intervals $\left\{ \begin{array}{l} 2 \quad 0 \quad 0 \\ \quad 25 \quad 0 \\ \quad \quad 18 \\ \quad \quad \quad 0.06 \end{array} \right\}$ the Table gives the Equivalent Sidereal Intervals $\left\{ \begin{array}{l} 2 \quad 0 \quad 19.713 \\ \quad 25 \quad 4.107 \\ \quad \quad 18.049 \\ \quad \quad \quad 0.063 \end{array} \right\}$

The Sum is the Sidereal Time required — 22 22 2'41

HOURS.			MINUTES.				SECONDS.								
Hours of Side- real Time.	Equivalents in Mean Time.			Minutes of Sidereal Time.	Equivalents in Mean Time.		Minutes of Sidereal Time.	Equivalents in Mean Time.		Seconds of Sidereal Time.	Equiva- lents in Mean Time.		Seconds of Sidereal Time.	Equiva- lents in Mean Time.	
	h	m	s		m	s		m	s		s		s		s
1	0	59	50·1704	1	0	59·8362	31	30	54·9214	1	0·9973	31	30·9154		
2	1	59	40·3409	2	1	59·6723	32	31	54·7576	2	1·9945	32	31·9126		
3	2	59	30·5113	3	2	59·5085	33	32	54·5937	3	2·9918	33	32·9099		
4	3	59	20·6818	4	3	59·3447	34	33	54·4299	4	3·9891	34	33·9072		
5	4	59	10·8522	5	4	59·1809	35	34	54·2661	5	4·9864	35	34·9045		
6	5	59	1·0226	6	5	59·0170	36	35	54·1023	6	5·9836	36	35·9017		
7	6	58	51·1931	7	6	58·8532	37	36	53·9384	7	6·9809	37	36·8990		
8	7	58	41·3635	8	7	58·6894	38	37	53·7746	8	7·9782	38	37·8963		
9	8	58	31·5340	9	8	58·5256	39	38	53·6108	9	8·9754	39	38·8935		
10	9	58	21·7044	10	9	58·3617	40	39	53·4470	10	9·9727	40	39·8908		
11	10	58	11·8748	11	10	58·1979	41	40	53·2831	11	10·9700	41	40·8881		
12	11	58	2·0453	12	11	58·0341	42	41	53·1193	12	11·9672	42	41·8853		
13	12	57	52·2157	13	12	57·8703	43	42	52·9555	13	12·9645	43	42·8826		
14	13	57	42·3862	14	13	57·7064	44	43	52·7917	14	13·9618	44	43·8799		
15	14	57	32·5566	15	14	57·5426	45	44	52·6278	15	14·9591	45	44·8772		
16	15	57	22·7270	16	15	57·3788	46	45	52·4640	16	15·9563	46	45·8744		
17	16	57	12·8975	17	16	57·2150	47	46	52·3002	17	16·9536	47	46·8717		
18	17	57	3·0679	18	17	57·0511	48	47	52·1364	18	17·9509	48	47·8690		
19	18	56	53·2384	19	18	56·8873	49	48	51·9725	19	18·9481	49	48·8662		
20	19	56	43·4088	20	19	56·7235	50	49	51·8087	20	19·9454	50	49·8635		
21	20	56	33·5792	21	20	56·5597	51	50	51·6449	21	20·9427	51	50·8608		
22	21	56	23·7497	22	21	56·3958	52	51	51·4810	22	21·9399	52	51·8580		
23	22	56	13·9201	23	22	56·2320	53	52	51·3172	23	22·9372	53	52·8553		
24	23	56	4·0906	24	23	56·0682	54	53	51·1534	24	23·9345	54	53·8526		
				25	24	55·9044	55	54	50·9896	25	24·9318	55	54·8499		
				26	25	55·7405	56	55	50·8257	26	25·9290	56	55·8471		
				27	26	55·5767	57	56	50·6619	27	26·9263	57	56·8444		
				28	27	55·4129	58	57	50·4981	28	27·9236	58	57·8417		
				29	28	55·2490	59	58	50·3343	29	28·9208	59	58·8389		
				30	29	55·0852	60	59	50·1704	30	29·9181	60	59·8362		

* From Nautical Almanack.

TABLES FOR CONVERTING INTERVALS OF SIDEREAL TIME INTO EQUIVALENT INTERVALS OF MEAN SOLAR TIME.

FRACTIONS OF A SECOND.

Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.
	s		s		s		s		s
0.01	0.00997	0.21	0.20943	0.41	0.40888	0.61	0.60833	0.81	0.80779
0.02	0.01995	0.22	0.21940	0.42	0.41885	0.62	0.61831	0.82	0.81776
0.03	0.02992	0.23	0.22937	0.43	0.42883	0.63	0.62828	0.83	0.82773
0.04	0.03989	0.24	0.23934	0.44	0.43880	0.64	0.63825	0.84	0.83771
0.05	0.04986	0.25	0.24932	0.45	0.44877	0.65	0.64823	0.85	0.84768
0.06	0.05984	0.26	0.25929	0.46	0.45874	0.66	0.65820	0.86	0.85765
0.07	0.06981	0.27	0.26926	0.47	0.46872	0.67	0.66817	0.87	0.86762
0.08	0.07978	0.28	0.27924	0.48	0.47869	0.68	0.67814	0.88	0.87760
0.09	0.08975	0.29	0.28921	0.49	0.48866	0.69	0.68812	0.89	0.88757
0.10	0.09973	0.30	0.29918	0.50	0.49864	0.70	0.69809	0.90	0.89754
0.11	0.10970	0.31	0.30915	0.51	0.50861	0.71	0.70806	0.91	0.90752
0.12	0.11967	0.32	0.31913	0.52	0.51858	0.72	0.71803	0.92	0.91749
0.13	0.12965	0.33	0.32910	0.53	0.52855	0.73	0.72801	0.93	0.92746
0.14	0.13962	0.34	0.33907	0.54	0.53853	0.74	0.73798	0.94	0.93743
0.15	0.14959	0.35	0.34904	0.55	0.54850	0.75	0.74795	0.95	0.94741
0.16	0.15956	0.36	0.35902	0.56	0.55847	0.76	0.75793	0.96	0.95738
0.17	0.16954	0.37	0.36899	0.57	0.56844	0.77	0.76790	0.97	0.96735
0.18	0.17951	0.38	0.37896	0.58	0.57842	0.78	0.77787	0.98	0.97732
0.19	0.18948	0.39	0.38894	0.59	0.58839	0.79	0.78784	0.99	0.98730
0.20	0.19945	0.40	0.39891	0.60	0.59836	0.80	0.79782	1.00	0.99727

Mean Solar Time *required* = Mean Time at the *preceding* Sidereal Noon (Mean Time of Transit of the First Point of Aries,) + the Equivalent to the *given* Sidereal Time.

EXAMPLE.—To convert 22h 22m 2.41s Sidereal Time at Greenwich, January 20th, 1922, into Mean Time.

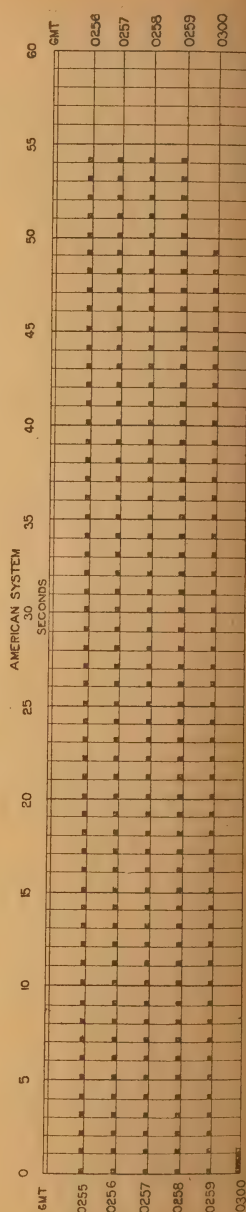
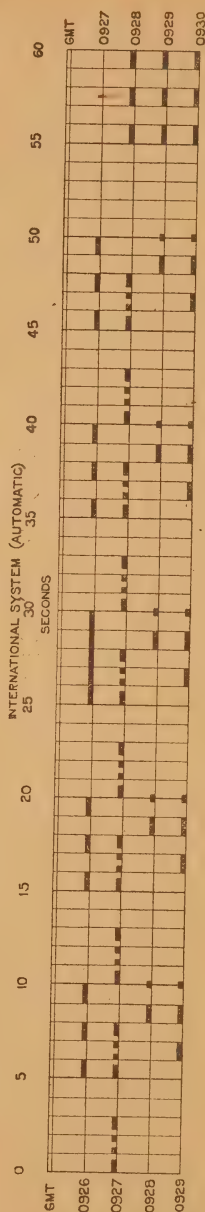
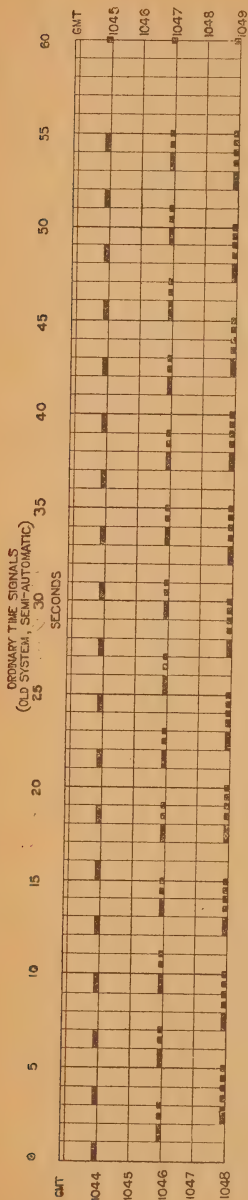
	h	m	s		h	m	s
Mean Time at the <i>preceding</i> Sidereal Noon, viz., January 19th	4	6	56.41*				
For	22	0	0		21	56	23.750
Sidereal	22	0			21		56.396
Intervals		2					1.995
		0.41					0.409
The Table gives the Equivalent Mean Intervals							
The Sum is the Mean Time required, January 20th				2 25 18.96			

* From Nautical Almanack.

STANDARD TIMES.

The following Standard Times, referred to the Meridian of Greenwich, have been adopted for railway and other purposes:—

h. m.	
11 30 E.	New Zealand.
11 0 E.	New Caledonia.
10 0 E.	Tasmania, Victoria, New South Wales, Queensland, New Guinea.
9 30 E.	South Australia.
9 0 E.	Japan, Korea.
8 0 E.	Western Australia, Portuguese Timor, British North Borneo, Philippine Islands, Macao, Hong Kong, China (Coast), Formosa.
7 0 E.	Straits Settlements, Federated Malay States, French Indo-China.
6 30 E.	Burma.
5 30 E.	India.
5 0 E.	Chagos Archipelago, Portuguese India.
4 0 E.	Mauritius, Seychelles.
3 0 E.	Somaliland, Madagascar.
2 30 E.	East African Protectorate.
2 0 E.	(East Europe).—Roumania, Bulgaria, Turkey, Greece. Egypt, Portuguese East Africa, South Africa.
1 0 E.	(Mid-Europe).—Germany, Luxembourg, Denmark, Sweden, Norway, Switzerland, Italy, Austria-Hungary, Bosnia, Servia, Malta, Portuguese West Africa, South-West Africa, Nigeria.
0 0	(Greenwich).—Great Britain, Ireland, France, Belgium, Spain, Portugal, Gibraltar, Algeria, Farøe Islands.
1 0 W.	Iceland, Madeira, Portuguese Guinea, Sierra Leone.
2 0 W.	Azores and Cape Verde Islands.
3 0 W.	Eastern Brazil.
4 0 W.	(Atlantic).—Part of Canada, Leeward Islands, Central Brazil, Chile.
5 0 W.	(Eastern).—Parts of Canada and United States, Western Brazil, Peru, Panama, Jamaica, Bahamas.
6 0 W.	(Central).—Parts of Canada and United States, Honduras.
7 0 W.	(Mountain).—Parts of Canada and United States.
8 0 W.	(Pacific).—British Columbia and Part of United States.
9 0 W.	Yukon, Alaska.
10 30 W.	Sandwich Islands.
11 30 W.	Samoa.



Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.	Notes.
ARGENTINE Buenos Aires (Norte)	LIH	800	h. m. s. h. m. s. 01 55 00-01 55 50 01 56 00-01 56 50 01 56 15-01 56 50 01 57 00-01 57 50 01 57 20-01 57 50 01 58 00-01 58 50 01 58 25-01 58 50 01 59 00-01 59 50 01 59 30-01 59 50 14 00 00	—, etc. • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.) • (T.S.)	Daily, except Sundays and holidays Controlled by Naval Ob. at Darsena Norte Duration of dot = $\frac{1}{4}$ sec.
AUSTRALIAN COMMONWEALTH Adelaide Melbourne Perth Sydney	VIA VIM VIP VIS	2,600 600 sp. 600 sp. 600 sp.	0227-0230 1427-1430 0157-0200 1357-1400 1057-1100 2257-2300 1057-1100 2257-2300	New International System (Eiffel Tower) " " " " " " " " " " " " " " " "	Signals transmitted automatically by the standard clock of the Adelaide Ob. Sundays excepted Controlled by Perth Ob.
BELGIAN CONGO	—	—	—	—	The following stations in this territory, viz.: Kinshasa, Coquilhatville, Umuangi-Lisala, Buta, Lusambo, Bumba-Kilo, Lukuga, Kindu, Stanley, ville and Elizabethville, have been organised to deal with T.S. as follows:— (1) Daily reception of T.S. from Lyons (France) (2) Emission of an approximate T.S. to stations within range
BRAZIL Rio de Janeiro (Ilha de Governador)	SOH	1,800	1357-1400 2357-2400	New International System (Eiffel Tower)	Signals sent 30 minutes later in case of accident preventing transmission at correct times
BRITISH INDIA Bombay Calcutta	VWB VWC	2,000 2,000	0057-0100 1257-1300 0127-0130 1327-1330	New International System (Eiffel Tower) " " " " " " " " Preliminary signals sent 2 min. before trans- mission of T.S. proper:— Call —●—●—●—●— repeated 3 times " Ordinary time signals" " Wait" (●—●—●—●—) (all sent by hand)	Signals automatically controlled from Colaba Ob., Bombay Signals automatically controlled from Alipore Ob., Calcutta. T.S. accurate to within $\frac{1}{5}$ secs. Should there be any inaccuracy the T.S. will be followed by the "erase" signal and the words "signal failed"

NOTE.—PKX is also the call signal of Bandung W/T station

Automatic
Semi-automatic
Automatic
Semi-automatic
Automatic

The T.S. are made precisely at 0215, 0217 and 0219 G.M.T. (*i.e.*, 2115, 2117, 2119 Standard mean times)

In the event of any inaccuracy occurring in the transmission of these signals the "erase" signal of 8 dots, repeated twice, will be sent out immediately after the message

Accurate to 0.2 sec. with San Francisco Naval Ob. time

Controlled by the Hong Kong Ob.
Dots about 0.2 sec. duration

• • • • • (T.S.)
— • • — • • • • etc.
• • • • • (T.S.)

New International System (Eiffel Tower)

New International Code	..	..	..
Rhythmic beats	..	..	..
Groups for correcting rhythmic beats	..	..	..
Old System	..	..	..
Rhythmic beats	..	..	..
Groups for correcting rhythmic beats	..	..	..
Old System	..	..	..
Rhythmic beats	..	..	..
Old System	..	..	..
Rhythmic beats	..	..	..

New International Code

American Code

Preliminary signals 2 mins. before transmission of T.S. proper:—
CO de BXY "Time wait."

The T.S. are dots sent at the even seconds from 0156-0200 G.M.T. and from 1256-1300 G.M.T. The dots are omitted at the 2nd, 28th, 50th, 52nd and 54th seconds of each min. for the purpose of identifying the signals

0057-0100

0927-0930
1000-1003
1038-1043
1044-1049
2200-2203
2236-2243
2244-2249
0850 (approx.)
0859-0904
2000 (approx.)

0215-0219

1157-1200
2357-2400

2355-2400

0156-0200
1256-1300

8,800
undamped

2,600 sp.

15,500
23,450
(undamped
musical)

600 sp.

3,000 CW.
3,100
(spark)

2,250 sp.
1,500 CW.

2,000

Malabar (Java)

TERANCE

Eiffel Tower

Lyons ..
Bordeaux ..

FRENCH INDO CHINA

Kien-Au

GERMANY

Nauen ..

HAWAIIAN ISLANDS.

Pearl Harbour

HONG KONG

Stonecutters

The old "provisional time signal service" in other than the actual I.S., are transmitted by hand
N.Z.M.T. is 11½ hr ahead of G.M.T.

Daily

Daily. Maximum error not more than 0.5 sec.; usual error not more than 0.1 sec

Daily

Operated under distant control from Balboa

Signals controlled from Manilla Observatory daily. Sundays and holidays included

T.S. controlled automatically from Ob.
Estimated range about 300 miles by day,
1,000 miles by night

Connected by land-line with Pulkova Ob.

The corrections to the T.S. are given at
19h. 05m. 10s.

The time of the first rhythmic signal is not communicated by wireless, but published at intervals

Connected by land line with Pulkova Ob.

The corrections to the T.S. are given at 22 h. 00 m. 20 s.

The time of the first rhythmic signal is not communicated by wireless, but published at intervals

I.S. (as above)
Six series of 31 signals, commencing at 22h. 02m. 30s., each set being separated by the omission of 9 signals. This is followed by a set of 121 signals. This is followed by six series of 31 signals similar to the previous set. The interval between contiguous signals is 48 to 40 sec.

Time—Continued

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.	Notes.
SOUTH AFRICA					
Capetown	VNC	600 sp.)	2059-2100	A series of 12 dashes (each about $\frac{1}{2}$ sec. duration) extending over half a minute, divided up into five groups, a dash commencing at each of the following G.M.T. :— Group I. h. m. s. 20 59 30 32 Group II. 34 20 59 38 Group III. 40 20 59 44 Group IV. h. m. s. 20 59 48 50 Group V. 20 59 54 56 58 00 Each signal may be used as indicating the exact G.M.T. recorded above; the beginning of the last dash of the series corresponding exactly with 21h. 00m. 00s. G.M.T.	Daily Controlled from the Cape Ob. The warning signal is commenced at 2055 G.M.T.
U.S.A.					
Annapolis	NSS	17,145 cw.	0255-0300 1655-1700	American Code	Daily The "lag" of the Annapolis T.S. is 0.08 sec. (constant)
Eureka	NPW	2,650 sp.	1955-2000	"	Daily. Controlled by Naval Ob., Marc Is.
Great Lakes	NAJ	1,988 sp.	1655-1700	"	Daily, except Sundays and holidays
Key West	NAR	1,988 sp.	0455-0500	"	Controlled by Naval Ob., Washington
New Orleans	NAT	1,832 sp.	1455-1500	"	Daily
North Head	NPE	2,700 sp.	1655-1700	"	The "lag" of the Key West T.S. is 0.28 sec.
San Diego	NPL	1,988 sp.	0425-0430 2125-2130	"	Daily
San Francisco	NPG	1,908 sp. 9,800 cw.	1955-2000	"	Daily. Controlled by Naval Ob., Marc Is.
Seattle	NVL	4,650 cw. 1,938 sp.	0325-0330 1655-1700	"	"
Washington (Arlington)	NAA	2,650 sp.	0155-0200 2055-2100 0255-0300 1655-1700	"	"
Charleston (S.C.)	NAO	2,250 sp.	0455-0500	"	Daily. Error generally less than 0.1 sec. The "lag" of the Arlington T.S. is 0.09 sec. (constant). Controlled by Naval Ob., Washington
Norfolk (Va.)	NAM	1,831 sp.	0455-0500	"	These stations transmit only when Washington NAA is out of action
New York	NAH	1,832 sp.	0455-0500	"	Daily. (transmits until daylight, except on)
Newport (R.I.)	NAP	1,068 sp.	0455-0500	"	

REGULATIONS FOR THE SAFETY OF NAVIGATION.

SAFETY SIGNAL.—The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, typhoons, cyclones, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power: — — — (T T T). In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress. The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes. The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character. When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
ALASKA Dutch Harbour, N.P.R., 600 sp. Juneau, NVD, 600 ..	0100 0500 1700 2100	—	Information concerning wrecks, derelicts, ice and other dangerous obstructions to navigation as received from the Hydrographic Office, Washington, or from a branch hydrographic office or other reliable source	Messages broadcast at times stated Naval W/T stations will furnish this information whenever practicable, to passing vessels on request,
ALGERIA Oran, FVO 1,350 ..	1800	—	—	The warning message will be repeated daily for a week if necessary
BELGIUM Ostende, OST, 600 ..	0800 1600	—	Messages preceded by the danger call (T T T) repeated at short intervals, 10 times on full power (As Ostende above)	Warnings are repeated three times at intervals of 10 minutes
Antwerp, OSA, 600 ..	0700 1500	—	.. .. .	do. do.
BRITISH INDIA Karachi, VWK Calcutta, VWC Port Blair, VTP (Andaman Is.) Bombay, VWB Madras, VWM Rangoon (Burma), VTK, all above 600 sp.	0115 1315 0105 1305	—	—	All warnings are broadcast as soon as possible after receipt; and then at the times stated for five successive days. The broadcast will be prolonged beyond the fifth day if considered necessary

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
CANADA Barrington Passage (Nova Scotia), VAL, 1,600 sp.	0130* 1330 following W.R.	(a) Ice reports. . . (b) N. (1) Bay of Fundy (2) Nova Scotia and New- foundland coasts (3) N. Atlantic (a) Ice reports . . (b) N. (1) Bay of Fundy (2) Nova Scotia and New- foundland coasts and N. Atlantic	—	Also sent <i>on request</i>
Cape Sable (Nova Scotia) VCU, 600 sp.	0200* 1400 following W.R.		—	Do.
Lurcher Lt-V. (Nova Scotia), VDR, 600 sp.	On request	—	—	Ice reports and navigational warnings sent <i>on request</i> . The station keeps watch for the first half of every odd hour from 1100 to 2300 G.M.T., and from 0200 to 0230 G.M.T. Also sent <i>on request</i>
Fame Point, VCG, 600 sp.	0145* 1345 following W.R.	(a) Ice reports . . (b) N. (1) Gulf of St. Lawrence and Straits of Belle Isle N. in— (1) The River St. Law- rence and (2) Gulf of St. Lawrence N. River St. Lawrence	—	The station will give the signal QRU after the general call QST if there is nothing to report Also sent <i>on request</i> . Station open only during season of navigation The station will give the signal QRU after the general call QST if there is nothing to report. Also sent <i>on request</i>
Quebec, VCC, 600 sp.	0130* 1330*	N. Lake Ontario	—	Also sent <i>on request</i>
Kingston (Ont.), VBH, 600 sp.	0400* following W.R.	Do.	—	Do.
Toronto (Ont.), VBG, 600 sp.	0340* following W.R.	N. Lake Erie . .	—	Do.
Port Burwell (Ont.), VBF, 600 sp.	0400* following W.R.	N. Lake Huron	—	Do.
Point Edward (Ont.), VBE, 600 sp.	0410* following W.R.	N. Georgian Bay and Lake Huron	—	Do.
Midland (Ont.), VBC, 600 sp.	0400*	N. Lake Superior and	—	Do.
Sault Ste. Marie (Ont.), VSSM, 600 sp.	0420*	N. Lake Superior	—	Do.
Port Arthur (Ont.), VPA, 600 sp.	0430*	N. Lake Superior	—	Do.

Campden-down, VCB, North Sydney, VCB, 600 sp.	Do.		Continuous watch is kept from December to March; and from 1200 to 0000, G.M.T. from April to November	Do.
Sable Island, VCT,	Do.		The station is open during the season of navigation only and keeps watch for the first half of every odd hour from 1100 to 2300 G.M.T. and from 0200 to 0230 G.M.T.	
Cape Bear (P.E.I.), VCP, 600 sp.	Do.		The station is open only during the season of navigation	
Grindstone Is., VCN,	Do.		The station is open only during the season of navigation	
Heath Point Lt.V. (Anti-Costi Is.), VCI, 600 sp.	Do.			
Clarke City (Quebec), VCK, 600 sp.	Do.			
Grosse Is. (Quebec), VCD, 600 sp.	Do.			
Montreal, VCA, 600 sp.	Do.			
St. John (New Brunswick), VAR, 600 sp.	Do.			
Tobemory, VBD, 600 sp.	Do.			
*GENERAL NOTE.—Especially urgent reports respecting dangers to navigation are also transmitted by these stations on 600 m. sp. immediately upon receipt, in addition to the routine times as stated				
CHILE Valparaiso, CCE, 1,000 sp.	0100 following T.S.)	—	The messages are preceded by the letters OHC (Oficina Hidrográfica de Chile)	Transmits notices to mariners of an urgent character containing information of immediate importance to seamen
CUBA Guantanamo, NAW	0100 1300 1700 2100	—		Messages en clair (in English)
DENMARK Blaavand, OXB, 600 sp.	1120 2120	Each message contains a short report on the ice conditions in the main Danish waterways compiled from information received by the Meteorological Institute	—●●●●● OXB OXB OXB. Ice report This is followed by the number of words comprising the message proper, and then the text of the latter, concluding with —●●●●● The text only is repeated, and the message ends with: OXB OXB OXB —●●●●● OXB OXB OXB. Ice Example: —●●●●● OXB OXB OXB. Ice report 26 w. Kattegat west channel : closed for sailing vessels east do. pack ice ; steamers beset do. southern part : open ice Sound and Belts : drift ice ; along west coast, pack ice All lightships removed (Repetition of foregoing) —●●●●● OXB OXB OXB —●●●●●	

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
DENMARK—continued. Copenhagen, OXA, 600 sp.	1100 2100	Do.	As for Blaavand (above) except for call sign of transmitting station	—
ESTHONIA Reval, ELN, 2,000 ..	0740	First Group— 1. Zard 2. Filsand 3. Dagerort Second Group— 4. Kynö 5. Werder 6. Worms Third Group— 7. Pakerort 8. Reval 9. Stenskar	Same codes as for German ice reports (see Königs- wusterhausen)	Only transmitted during winter
FINLAND Helsingfors, OJA, 2,000	1458 following W.R.	Coast of Finland (see Notes)	<p>Finnish ice report INININ INININ INININ INININ</p> <p>ICE CONDITIONS (I.).</p> <p><i>Navigation practicable</i></p> <p>0. Clear of ice</p> <p>6. Fixed smooth or nearly smooth ice</p> <p>7. Heavy ice, partly packed or screwed; open sea visible outside</p> <p>3. Fixed smooth ice; open sea visible outside</p> <p>4. Close slush or thin drift ice</p> <p><i>Navigation impossible</i></p> <p>5. Close drift ice; open sea visible outside</p> <p>1. Drift ice is called close even if there are openings to leeward of islands and shoals, or when there</p>	<p>Each pair (IN) concerns the conditions in the district or channel according to the following order:</p> <p>First group of signals—</p> <p>First pair—From sea to Trangsund (Viborg)</p> <p>Second pair—From sea to Kotka</p> <p>Third pair—From sea to Helsingfors past Grahara</p> <p>Second group of signals—</p> <p>First pair—Near Porkkala Light</p> <p>Second pair—From sea to Hangö</p> <p>Third pair—The channel from Hangö to Erstan</p> <p>Third group of signals—</p> <p>First pair—The channel from Aboto Lovskar</p> <p>Second pair—The channel from Lovskar past Uto to sea</p> <p>Third pair—The channel from Lovskar to Ledsund</p> <p>Fourth group of signals—</p> <p>First pair—From sea to Mariehamn</p> <p>Second pair from sea to Raumo</p> <p>Third pair—From sea to Mantykuroto (Bjorneborg)</p> <p>Fifth group of signals—</p>

FRANCE
Basse Lande (Nantes),
UA, 2,800

Toulon-Mourillon, FUI,
1,350

GERMANY
Königswusterhausen,
LP, 5,250

Mines or dangers or alterations to buoyage

1. Sea fog
2. Navigation only possible with the assistance of ice breakers
3. Navigation difficult, but possible for sailing vessels assisted by tugs
4. Navigation difficult; closed to sailing vessels
5. Navigation only possible with the assistance of ice breakers
6. Navigation difficult, but possible for sailing vessels assisted by tugs
7. Navigation continued
8. Navigation channel kept open by ice breaker
9. Navigation closed
- X. No information

For the German coasts in the North Sea and Baltic (See notes)

0000 (following I.S.)
1200 (following I.S.)
0900 (following W.R.)
1940 (following W.R.)

JKJKJK JKJKJK JKJKJK

J = ICE CONDITIONS

- 0 = Open water
- 1 = Thin loose ice
- 2 = Drift ice
- 3 = Thin covering of ice
- 4 = Close pack ice
- 5 = Difficult drift ice
- 6 = Thick covering of ice
- 7 = Heavy drift ice
- 8 = Heavy masses of ice
- 9 = Not known

K = EFFECT ON NAVIGATION

- 0 = Conditions not known owing to fog, snow, etc.
- 1 = Navigation practicable
- 2 = Navigation difficult for sailing vessels
- 3 = Navigation difficult, but practicable, for sailing vessels assisted by tugs
- 4 = Navigation very difficult; closed to sailing vessels
- 5 = Navigation only practicable for large steamers.
- 6 = Navigation only practicable with the assistance of ice breakers
- 7 = Navigation closed
- 8 = Navigation channel kept open by ice breakers
- 9 = Not known

The warning message will be repeated daily for a week if necessary

The warning will be repeated daily for a week if necessary

Areas covered by ice reports:—

Reporting station

Group No.

- First .. 1 Brusterort .. Off-lying sea area
- 2 Pillau .. Harbour and roadstead
- Second .. 3 Swinemünde .. Do.
- 4 Travemünde .. Do.
- 5 Holtenau .. Kiel Canal at Brunsbüttel
- 6 Brunsbüttelkoog Off-lying area in the Elbe
- Third .. 7 Hamburg .. Do.
- 8 Brake (Weser) .. Off-lying area in the Weser
- 9 Nesserland (Ems) Off-lying area in the Ems and harbour

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
GERMANY—continued.				
Borkum, KBM, 600 ...	0300 0700 1100 1500 1900 2300	—	Code as for Königswusterhausen (above)	—
Cuxhaven, KCX, 600 sp.	On request	Information concerning actual condition of outer navigational marks off the Baltic portion of the German coast	—	A charge is made for the message
Norddeich, KAV, 600..	1015 following W.R.	Warnings relating to the North Sea	Code as for Königswusterhausen These warnings will be preceded by the signal —•••— —•••— —•••— —•••— a minute, followed by the call sign of the station	Norddeich KAV also transmits messages concerning navigation to ships by wireless TELEPHONE, w.l. 600 m. and 1,800 m. A charge is made for the message During the winter the Norddeich W.R. is supplemented by an ice report, giving a brief description <i>en clair</i> of ice conditions in the entrances of the Rivers Ems, Jade, Weser and Elbe
Swinemünde, KAW, 600	1030 following W.R.	Warnings relating to the Baltic	The text of the message will then be repeated three times	During winter the Swinemünde W.R. is supplemented by an ice report giving a brief description of the ice conditions in the principal German harbours of the western and middle Baltic
Aussen Jade Lt. V., KAU, 450	—	—	—	Note.—Warnings from all the above German stations will be transmitted immediately the information is received, afterwards at the fixed times given for as long as necessary
HAWAIIAN IS.				
Honolulu, NPM, 2,250	0630	—	—	Broadcasts information concerning wrecks

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
GREAT BRITAIN <i>continued.</i>				
Wick, GKR	0200 0800 1400 2000	North Sea, also shipping approaching or leaving the Pentland Firth	—	Broadcasts at stated times, and also immediately upon receipt of information
Cullercoats, GCC ..	0330 0910 1530 2100	North Sea	—	do.
Malin Head, GMH (all above 600 sp.)	0200 0800 1400 2000	Atlantic	—	do.
NETHERLANDS Scheveningen, PCH, 1,800 sp.	1115 2315 both following W.R.	—	Advice to navigators (alterations to lighthouses, lightships and lightbuoys, the presence of derelicts, and the disappearance or displacement of light- ships, lightbuoys or important buoys) sent in Dutch and English; the advice in Dutch is preceded by the letters NBEZ	If there is no advice to navigators, the message will consist only of the W.R., preceded by KNMI completed where necessary by the storm signal. Urgent warnings are transmitted at other times, preceded by the International Safety Signal — — — —
NEWFOUNDLAND Cape Race, VCE, 600 sp.	0215 1415 following W.R.	(a) Ice report (b) N. for— 1. Gulf of St. Lawrence 2. Nova Scotia and New- foundland coasts and N. Atlantic	—	Also transmitted on request
Belle Isle, VCM, 600 sp.	0230 1430 following W.R. On request	(a) Ice report (b) N. for Gulf of St. Lawrence and Straits of Belle Isle	—	Also transmitted on request
Point Amour, VCL, 600 sp. St. John's, BZM, 1,600	—	Station to be closed end of May, 1922	—	—
NICARAGUA Managua, NAZ, 952 ..	0100 1300 — 1500	—	—	—

NORR.—Arrangements have been made with the United States Coastguard cutters on ice patrol, in the vicinity of the Great Banks of New-
foundland, to broadcast the ice and other reports respecting dangers to navigation hitherto transmitted by St. John's (Newfoundland) W/T
station

Mayen (lat. 70° 59' N. 8° 18' W.)	1100 2300 both following W.R.	PACIFIC ISLANDS Papeete (Tahiti), FOP 600 sp.
Caribbean Sea ..	1000 1800 both following T.S.	PANAMA Colon, NAX, 1,620 ..
Zone between the equator and lat. 20° 00' N.	1000 1800 both following T.S.	Baiboa, NBA, 10,100 cw.
—	0100 1300 1700 2100	PORTO RICO San Juan, NAU, 2,750
—	0730 2130	SAMOA ISLANDS Turulia, NPU, 600 sp.
The coast from Svart- klubben lighthouse to Salmis pilot station	1655 2155	SWEDEN Hernösand, SAH, 600 sp.
The coast from Olands Södra Udde lighthouse to Salmis pilot station do.	1650 2150	Vaxholm, SAF, 600 sp.
From Kullen lighthouse to Salmis pilot station	—	Gotland, SAE, 600 sp.
From Dyngö pilot station to Aspö pilot station	1700 2200	Karlskrona, SAA, 600 sp. Göteborg, SAB, 600 sp.

Only sent when necessary

Plain language message (in French and English) concerning alterations to lightships or lightbuoys, presence of derelicts and disappearance of light-buoys or important buoys

This information is also furnished to passing vessels on request

Ice warnings are issued by the Pilotage Department

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time, G.M.T.	Area covered by message.	Codes.	Notes.																																																												
SWEDEN—continued. Karlsborg (Stockholm), SAJ, 2500	1215 following W.R.	I.N. Coast of Sweden .. (see Notes)	<p>ICE SIGNALS</p> <p>The ice signals and the effects of ice conditions on navigation are transmitted according to the following code:—</p> <table><tr><td>Main Group AA.</td><td>Main Group BB.</td></tr><tr><td>Sub-Groups.</td><td>Sub-Groups.</td></tr><tr><td>I.</td><td>I.</td></tr><tr><td>AA IS IS IS</td><td>BB IS IS IS</td></tr><tr><td>II.</td><td>II.</td></tr><tr><td>IS IS IS</td><td>IS IS IS</td></tr><tr><td>III.</td><td>III.</td></tr><tr><td>IS IS IS</td><td>IS IS IS</td></tr><tr><td>Main Group CC.</td><td>Main Group DD.</td></tr><tr><td>Sub-Groups.</td><td>Sub-Groups.</td></tr><tr><td>I.</td><td>I.</td></tr><tr><td>CC IS IS IS</td><td>DD IS IS IS</td></tr><tr><td>II.</td><td>II.</td></tr><tr><td>IS IS IS</td><td>IS IS IS</td></tr><tr><td>III.</td><td>III.</td></tr><tr><td>IS IS IS</td><td>IS IS IS</td></tr></table> <p>The letter "I" replaced by either a number or the letter "x" indicating ice conditions, and the "S" replaced by either a number or the letter "x" indicating navigation conditions, have the following signification:—</p> <p>ICE CONDITIONS (I).</p> <p>0 = Clear of ice. 1 = Loose sludge and pan- cake ice. 2 = Spread drift ice. 3 = Packed sludge. 4 = Fixed ice. 5 = Drift ice. 6 = Heavy fixed ice. 7 = Heavy drift ice. 8 = Pack ice. 9 = Screw ice. x = No information.</p>	Main Group AA.	Main Group BB.	Sub-Groups.	Sub-Groups.	I.	I.	AA IS IS IS	BB IS IS IS	II.	II.	IS IS IS	IS IS IS	III.	III.	IS IS IS	IS IS IS	Main Group CC.	Main Group DD.	Sub-Groups.	Sub-Groups.	I.	I.	CC IS IS IS	DD IS IS IS	II.	II.	IS IS IS	IS IS IS	III.	III.	IS IS IS	IS IS IS	<p>DAILY DURING WINTER.</p> <p>The message is sent in code and is immediately preceded by a message <i>en clair</i> (in English) giving any important alterations to aids to navigation and sunken wrecks or derelicts reported. With the exception of that part relating to derelicts, this information is transmitted for four successive days. On the cessation of the ice service, navigation warnings will immediately follow the weather report</p> <p>List of channels and areas for which ice and navigation conditions are given.</p> <table><tr><th>Main group.</th><th>Sub-group.</th><th>Number or letter "x" in sub-groups.</th><th>Channels or areas.</th></tr><tr><td>AA</td><td>I</td><td>1st and 2nd 3rd and 4th 5th and 6th</td><td>Channel from the sea to Karlsborg Sea outside Rodkal- len Channel to Lulea through Tjufholm sund</td></tr><tr><td></td><td>II</td><td>1st and 2nd 3rd and 4th 5th and 6th</td><td>Sea outside Gasbren West Quarken</td></tr><tr><td></td><td>III</td><td>1st and 2nd 3rd and 4th 5th and 6th</td><td>Sea outside Skag Sea outside Hernö Angermanälven above Svanö</td></tr><tr><td></td><td>I</td><td>5th and 6th</td><td>Angermanälven below Svanö</td></tr><tr><td>BB</td><td>I</td><td>1st and 2nd 3rd and 4th 5th and 6th</td><td>Sea outside Bremö Channel: Bremö to Draghallen light</td></tr><tr><td></td><td>II</td><td>1st and 2nd 3rd and 4th</td><td>Alnö sund Sea outside Lill- jungfrun Sea around Egge- grund</td></tr></table>	Main group.	Sub-group.	Number or letter "x" in sub-groups.	Channels or areas.	AA	I	1st and 2nd 3rd and 4th 5th and 6th	Channel from the sea to Karlsborg Sea outside Rodkal- len Channel to Lulea through Tjufholm sund		II	1st and 2nd 3rd and 4th 5th and 6th	Sea outside Gasbren West Quarken		III	1st and 2nd 3rd and 4th 5th and 6th	Sea outside Skag Sea outside Hernö Angermanälven above Svanö		I	5th and 6th	Angermanälven below Svanö	BB	I	1st and 2nd 3rd and 4th 5th and 6th	Sea outside Bremö Channel: Bremö to Draghallen light		II	1st and 2nd 3rd and 4th	Alnö sund Sea outside Lill- jungfrun Sea around Egge- grund
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1 = Navigation unobstructed	CC	I	3rd and 4th	Visible area around vessel
2 = Navigation difficult for sailing vessels or possible with the help of tugs			5th and 6th	Sea outside Söderarm
3 = Navigation stopped for sailing vessels			1st and 2nd	Sea outside Sandhamn
4 = Navigation only possible for powerful steamers			3rd and 4th	Channel : Sandhamn to Stockholm
5 = Navigation only possible with help from ice breaker			5th and 6th	Sea outside Landsort
6 = Channel kept open by ice breaker	II		1st and 2nd	Channel: Landsort to Stockholm
7 = Navigation stopped			3rd and 4th	Channel : Häfringe to Oxelösund
8 = Navigation closed			5th and 6th	Kalmarsund, north of Kalmär
9 = Condition unknown on account of fog, snow, etc	III		1st and 2nd	Kalmarsund, south of Kalmär
x = No information			3rd and 4th	South entrance to Kalmarsund
When conditions are the same in all channels and areas under one main group (for example: clear of ice, open for navigation), only main group letters are given, followed by the figures, as "AA OO." If the conditions should be the same in all channels and areas in several main groups, the letters of the main group will be sent out followed by the figures indicating the conditions as "CC DD oo."	DD	I	5th and 6th	Sea outside Karls-
The information is given as follows : First, the attention signal (— — — — —) ; then the call signal for all stations from Karlsborg W/T Station (CQ CQ de SAJ SAJ SAJ) repeated three times, the words "Swedish ice report," and then the information as to ice and navigation conditions"			1st and 2nd	hann
			3rd and 4th	South entrance to Öresund
			5th and 6th	Flint rännan
			1st and 2nd	Sea outside Helsing-
	II		3rd and 4th	North entrance to Öresund
			5th and 6th	Sea outside Halmstad
			1st and 2nd	Sea outside Varberg
	III		3rd and 1 4th	Sea outside Vinga Channel : Vinga to Göteborg
			5th and 6th	Sea outside Smögen

NAVIGATIONAL WARNINGS

During that portion of the year when the ice signals are suspended, any information concerning alterations to Swedish lights and buoyage, sunken wrecks, derelicts, etc., will be broadcast *en clair* in English by Karlsborg W/T station, at 2000 G.M.T. (civil), on a wavelength of 2,500 metres, immediately before the press telegram for Swedish vessels.

Example

Example
 — • • • — CQ CQ CQ de SAJ SAJ SAJ CQ CQ CQ
 de SAJ SAJ SAJ CQ CQ CQ de SAJ SAJ SAJ
 Swedish navigational warning lightbuoy Rata
 Storgund disappeared

With the exception of the part relating to derelicts, this message is repeated for four successive days

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
SWEDEN—continued. Boden, SAI, 600 ..	—	—	—	This station transmits information concerning ice and navigation conditions on request. A charge of 5 kroner is made for each message if the information is available at the station. If it has to be obtained specially from some other source the charge is 7.50 kroner per message. The warning will be repeated daily for a week if necessary
TUNIS Bizerta, FUA, 1,350 ..	1730	—	—	—
URUGUAY Cerrito (Monte Video), CWA, 600	—	—	—	—
U.S.A. Seattle (Wash.), NVL..	0301 1701 2100	Zone N. of lat. 46° 00' N., including Vancouver and Queen Charlotte Sounds and Alaskan waters Zone included between lat. 42° 00' N. and 46° 00' N.	All hydrographic information, which includes reports on ice, wrecks, derelicts, floating obstructions, and important changes in aids to navigation, should be addressed to the Hydrographic Office and any of its branch offices by mail, and to any of the following naval radio stations by radio, addressed "Govt. Hydro"	General Note (applicable to all stations): UNITED STATES NAVIGATIONAL WARNINGS: PROCEDURE. The procedure, as far as masters of vessels are concerned, is divided into two parts: (a) Sending hydrographic information to the U.S. Naval W/T stations (b) Receiving information twice daily when within range of the distributing W/T station of its zone Information will not be broadcast unless danger to a vessel is involved, either from collision or a resulting inadequacy of aids to navigation
North Head (Wash.), NPE	—	Zone included between lat. 33° 00' N. and 42° 00' N.	U.S. naval radio stations	Call letters
San Francisco, NPG ..	—	Zone included between lat. 33° 00' N. and 42° 00' N.	U.S. naval radio stations	Call letters
Galveston (Texas), NKB, 1,813	1630 2300	Gulf of Mexico, W. of the line Ship Shoal Light (La.) and Cape Catoche (Yucatan)	Atlantic Ocean Boston .. New York .. Philadelphia .. Norfolk .. Baltimore .. Charleston .. New Orleans .. Galveston .. St. Thomas .. Virgin Islands .. San Juan .. Navassa Island .. Guantanamo,	NAD NAH NAI NAM NBZ NAO NAT NKB NAV NBB NAW
			Pacific Ocean Balboa .. San Francisco .. North Head .. Seattle.. ..	NBA NPG NPE NVL
			Great Lakes Duluth .. Chicago .. Buffalo .. Cleveland ..	NUX NVR NNZ NRH

Broadcasts at two-minute intervals, except when necessary, information received from coastguard cutter on the Ice Patrol

Zone S. of lat. 35° 00' N., including Cape Sable (Fla.) and Cay Piedras (Cuba)

1550

Charleston (S.C.), N.Y.C.

● Norfolk (Va.), NAM, 1,851	1545 2100	Zone included between the parallels of lat. 38° 30' N. and 33° 00' N., the entrance to Chesapeake Bay, Hampton Roads, Newport News and Norfolk	—	do.	do.
Washington (Arlington), NAA, 5,950, 2,650 sp.	1530 1700 0200 following W.R.	Chesapeake Bay, with the exception of Newport News and Norfolk	—	do.	do.
Baltimore, NBZ, 700 ..	1530 2100	Note.—This overlaps with Norfolk W/T on Hampton Roads and the entrance to Chesapeake Bay	—	do.	do.
Philadelphia, NAI, 1,948	1545 2200	Zone included between the parallels of lat. 39° 30' N. and 38° 30' N., including Delaware River and Delaware Bay	—	do.	do.
Boston (Mass.), NAD, 1,620	1600 2200	Zone S. of lat. 43° 00' N., and N.E. of a line joining Point Judith and Nantucket Shoal Lt. V. and N. of parallel of Nantucket Shoal Lt. V	—	Also broadcasts, at the times indicated, all information regarding ice and its movement in the North Atlantic (information received from the coastguard cutter on Ice Patrol)	
Buffalo (N.Y.), NNZ, 1,200	1545 2200	—	—		
Cleveland (Ohio), NRH, 1,080	1600 2230	—	—		
Chicago, NVR, 1,200 ..	1600 2230	—	—		
Duluth, NUX, 1,200 ..	1545 2145	—	—		
New York, NAH, 1,832	1530 2200	Zone included between the parallels of lat. 42° 00' N. and 39° 30' N. Note.—This zone intentionally overlaps the Boston zone	—		

Also broadcasts, at time indicated, all information relating to ice and its movement in the North Atlantic (information received from the coast guard cutter on Ice Patrol)

Hydrographic—Continued

Country, Station, Call, Wavelength.	Time G.M.T.	Area covered by message.	Codes.	Notes.
U.S.A.—continued New Orleans, NAT, 1,832	1600 2200	Gulf of Mexico, between the line Cape Sable (Fla.) and Cay Piedras (Cuba), and the line Ship Shoal Light (La.) and Cape Catoche (Yucatan), including the Yucatan channel	—	—
Key West, NAR, 600, 1,988	0300 following W.R.	—	—	—
Annapolis, NSS, 17,145 cw.	2200	—	—	—
United States Coast Guard Cutters: "Tampa," NITC or "Modoc," NIVD 600 sp.	0900 2300	—	—	—

REPORTING DERELICTS AND VESSELS IN DISTRESS
It frequently happens that masters of vessels, when sighting derelicts or vessels in distress, and in reporting them by radio, fail to observe and report essential data as to the condition of the craft, necessary before a search is begun by a United States Coastguard cutter. In consequence of this neglect it frequently becomes necessary for the searching cutter to send radiograms in an effort to obtain the necessary information. To be complete, information concerning a derelict should state:

- The general condition of the vessel
- Whether bottom up or awash
- Height of hull above water and any abnormal conditions as to buoyancy
- As to whether masts are standing, sails set, or otherwise
- Force and direction of wind
- Any observed current, its set and strength

Similar descriptive information should also be furnished of vessels in distress. This information is necessary in order to determine roughly the direction and speed of drift of the derelict or vessel, and also to give an idea of the appearance of the object sought.

All the U.S. Naval W/T stations mentioned in the foregoing schedule are open at all times to receive reports concerning hydrographic information from masters of vessels. The messages are to be endorsed "Govt. Hydro," and transmitted in plain language direct to the W/T station which disseminates

This message is sent three times, with intervals of two minutes between each

In preparing information for transmission, it is desired that messages be concise as consistent with exactness and clearness. The order of the message will be in the order of the importance of the items. To promote uniformity the following order of subjects is recommended:—

- Derelicts and sunken wrecks.
- Mines.
- Ice.
- Aids to navigation adrift.
- Floating rafts, logs, wreckage.
- Misplaced buoys in approaches to harbours.
- Other items considered sufficiently important to broadcast.

Note.—Vessels in the Caribbean Sea and West Indian waters north of the parallel of lat. 15° 00' N. should report to any of the under-mentioned W/T stations, which will transmit the information, via West Key, to Savannah and New Orleans W/T stations:—

Country.	Name of W/T station.	Call Signal.
Virgin Islands	St. Thomas	NBB
Porto Rico	San Juan	NAU
Cuba	Guantanamo	NAW

Broadcasts all information relating to ice and its movement in the North Atlantic, which is received from the United States Coastguard Cutter on the Ice Patrol

These stations will also transmit the latest information concerning ice to any ship upon request

0100
1300
1700
2100

St. Croix, NNI, 2750.
St. Thomas, NBB, 2750

WINDWARD PASSAGE

0100
1300
1700
2100

Navassa Island, NKC,
2750

UNION RADIO SCIENTIFIQUE INTERNATIONALE

U.R.S.I. Signals

Amongst the decisions arrived at by the International Conference on Radio Communications held in Paris during June, July and August, 1921, was the necessity for the transmission by a number of transmitting stations, of scientific signals for the purpose of observations relating to the *law of the propagation of energy*.

The *law of the propagation of energy* has not yet been established on a completely and rigorously scientific basis. The study of this question covers the choice of the most convenient analytical formula, the determination of its constants, the examination of the continuous variations that the phenomenon of propagation undergoes and of the causes which produce them, the definition of the methods suitable for the measurement of the very feeble reception currents and of the electromagnetic fields produced, the establishment of the direction along which the propagation of energy takes place, etc. In order to commence the attack upon the problems it has been proposed by the Paris Conference that a certain number of transmitting stations should execute at suitable hours some particular transmissions of which the wavelength (or frequency) and the intensity of the current in the antenna should be accurately measured. A certain number of observers, distributed in the receiving stations of different countries, should record the intensity of these signals, or better, that of the corresponding electromagnetic field and possibly also the direction of propagation.

The signals, to be transmitted under the direction of the Union Radio-Scientifique Internationale (U.R.S.I.), should last three full minutes; the first minute serving for the regulation of the receiving apparatus and consisting of the repeated emission of a signal composed as follows:—

“URSI of (name of the station)—(wavelength in metres of the emission made the day before)—(intensity of current in amperes during that same emission)” as, for example, “URSI of XY—18,500—230.” The succeeding two minutes should be occupied in the emission of a long dash. There should then be sent to the Central Bureau (at Brussels) the schedules of each transmitting station containing the largest possible amount of technical data upon the emissions carried out, on the antenna, on the apparatus, on the meteorological conditions, etc. Analogous data should be despatched also by the stations that send out signals at regular times because they also are able to serve for measurements of intensity of reception. All this data should be rapidly co-ordinated by the Central Bureau, and should be printed and distributed widely to those interested. Similarly, receiving stations should record all relative data for the purpose of co-ordination of results.

The study of atmospheric disturbances and research in the direction of their elimination is probably one of the most important subjects in connection with wireless telegraphy at the present day.

Since February 1st 1922, the following French stations have transmitted U.R.S.I. signals. The transmissions are made *daily* at the times indicated below:—

(1) *Eiffel Tower (FL)*

Station particulars:

Latitude	..	..	..	48° 48' N.
Longitude	..	..	..	2° 15' E.
Effective height of aerial	..	..	..	85 metres

Spark transmission :—

(1) Wavelength	.. ..	2,600 metres
(2) Frequency*	.. ..	115.300 K.C.
Intensity of current in aerial	.. ..	85 A.
Energy in aerial	.. ..	55 k.W.
Resistance of aerial	.. ..	7.6 Ω.

Procedure.

At 1034 G.M.T.	U.R.S.I. de FL . . . U.R.S.I. . . . (exact wavelength and energy in aerial of previous day's transmission).
At 1036 G.M.T.	Two minutes dash.
At 1038 G.M.T.	Preparatory signals preceding the ordinary semi - automatic T.S. of 1045.

(2) *Bordeaux (La Fayette).* (L.Y).

Station Particulars :—

Latitude	.. ..	44° 42' N.
Longitude	.. ..	0° 48' W.
Effective height of aerial	.. ..	170 metres
Poulson arc transmission :—		
(1) Wavelength	.. ..	23,450 metres
(2) Frequency*	.. ..	12.800 K.C.
Intensity of current in aerial	.. ..	480 A.
Energy in aerial	.. ..	300 k.W.
Total resistance of aerial	.. ..	1.17 Ω.

Procedure.

At 1955 G.M.T.	URSI de LY . . . URSI de LY . . . (Exact wavelength and energy in aerial of previous day's transmission).
At 1956 G.M.T.	Two minutes dash.
At 1958 G.M.T.	Preparatory signals preceding the scientific T.S. (rhythmic beats) of 2000.

(3) *Nantes.* (UA).

Station particulars :—

Poulson arc transmission wavelength . . 9,000 metres.

Procedure.

At 1415 G.M.T.	URSI de UA . . . URSI de UA . . . (Exact wavelength and energy in aerial of previous day's transmission).
At 1416 G.M.T.	Two minutes dash.

NOTE.—In the absence of accurate information as to the exact wavelength and energy in aerial of the transmissions of the previous day, a series of the letter "x" will be transmitted in place of these figures.

CALIBRATED WAVES.

Transmission of calibrated waves is made by the undermentioned stations :—

- (1) *Eiffel Tower* (FL) on the 1st and 15th days of each month.

Calibration wave = 5,000 metres.

Procedure : C.W. transmission (energy in aerial about 60 kw.).

From 1800-1801 (G.M.T.) • — • — • — • — • — etc.

At 1801 (G.M.T.) three-minute dash (5,000m. wave).

* Frequency is expressed in "kilo-cycles" (K.C.), this term denoting "thousands" of complete cycles per sec." The formula connecting wavelength and frequency is :—

$$\text{Wave (in metres)} = \frac{3 \times 10^8}{\text{K.C.}}$$

Calibration wave = 7,000 metres.

From 1810-1811 (G.M.T.) — . . . — . . . — . . .
etc.

At 1811 (G.M.T.) three-minute dash (7,000 m. wave).

It is impossible to ensure the transmission of rigorously exact wavelengths. Very precise measures of the waves as they are received are made in the laboratories of the "Invalides" at Paris, and the corrections to be applied are thus determined. The station at Lyons (see below) transmits the exact length of these waves at 1900 G.M.T.

(2) Lyons (YN) on the 1st and 15th days of each month.

Calibration wave = 10,000 metres.

Procedure: C.W. transmission (energy in aerial about 100 kw.).

From 1820-1821 (G.M.T.) — . — . — . — . — .
etc.

At 1821 (G.M.T.) three-minute dash (10,000m. wave).

Calibration wave = 15,000 metres.

From 1830-1831 (G.M.T.) — . . — . . — . . , etc.

At 1831 (G.M.T.) three-minute dash (15,000m. wave.)

TRANSMISSION OF CORRECTED VALUES FOR THE FOUR WAVES ABOVE (i.e., 5,000, 7,000, 10,000 and 15,000 metres).

Procedure: At 1900 (G.M.T.) a series — . — . — . , followed by — . — . — . — . (C.Q.) — . . . — (a group of figures giving the exact wavelength of first wave, approximately 5,000 m.); (a group approximately 7,000); (a group approximately 10,000); (a group approximately 15,000). The whole message is sent three times in succession.

The Air Ministry (GFA) transmits a series of calibrated waves daily at times shown.

Time G.M.T.	Wave- length C.W.	Call Signs.	Signal.	Correction.
0745	1400	CQV GFA	A series of figures 1 (. — — — —) for 30 sec., fol- lowed by a single dash (—) lasting 5 sec.	Immediately following the 5 sec. dash any necessary correction will be transmitted as follows:—
0800	1680	CQV GFA	A series of figures 2 (. . — — —) for 30 sec., fol- lowed by a single dash (—) lasting 5 sec.	Indicating figure for the wave (i.e., "1," "2," B.T., followed by a 4-figure group, indi- cating the actual wave- length transmitted.
0750	900	CQV GFA	A series of figures 3 (. . . — —) for 30 sec., fol- lowed by a single dash (—) lasting 5 sec.	If no correction is nec- essary, VA will be made after the 5 sec. dash.

A List of Calibrated Waves sent out by various stations is contained in the Regular Transmissions of Wireless Stations in the Amateur and Experimental Section.

TRANSMISSION OF EARTHQUAKE NEWS BY W/T.

Seismological Radiotelegrams.

It seldom happens that rapid communication of seismological observations is seriously needed, because the accurate location of an epicentre is best undertaken when all the information relating thereto is available. At present the role of W/T is that of providing a means of roughly checking the reliability of information in a report, which, from the records of local instruments, appears to be misleading.

(1) Details of Seismological reports transmitted by the Eiffel Tower (FL).

These reports give information regarding earthquake disturbances registered by the seismographs at the Geophysical Observatory at Strasbourg, or transmitted thereto by any of the co-operating seismological observatories at Algiers, Athens, Barcelona, Brussels, Coimbre, Oxford, Paris, Rome, Zurich and Wei-hai-Wei (China).

The messages are sent when necessary either (a) after the 1920 G.M.T. Synoptic Weather Report, or (b) at the end of the 1905 G.M.T. International Collective Report. Transmission is made on a wavelength of 2,600 metres (musical spark), and the energy in the aerial is approximately 60 kw.

Form of Message.

There are three forms of report varying with the nature and extent of the disturbance :—

- (a) Reports giving information regarding slight movements of the earth's crust or quakes of very feeble intensity. These reports are preceded by the words "Sismo Strasbourg," followed by a message *en clair* (in French) giving the particulars.

Example : "Sismo Strasbourg" le 28 mai, longues ondes vers 20h. 12m., maximum NS, 20h. 26m. Séisme lointain 21h. 05m., 46s. ; maximum 21h. 44m.

- (b) The message also frequently gives particulars of micro-seismic disturbances. These minute disturbances may be due to the passage of atmospheric depressions over the land or the breaking of waves against the cliffs or a combination of the two causes. Reports from other French observatories are often included.

Example : "Sismo Strasbourg" du 6 ou 7 juin, agitation croît légèrement. Briançon signale secousse du degré 4, durée 2 secondes à 8h. 20m.

- (c) Important earthquake disturbances are transmitted in the following code :—

ddaaap phhmm ssttt D₁D₁DDD.

where the symbols have the following meanings :—

dd = day of month.

aa = azimuth of epicentre from 10° to 10° counting from N through E (01-36), based on any *clair* indications of the trace on the seismograph(s). The addition of 50 (*i.e.*, figures 51-86) indicates that the azimuth is uncertain by $\pm 180^\circ$. The figures 91-98 are used to indicate that the direction is vague and estimated only to the nearest 45°; 99 means that no azimuth determination has yet been made; 00 that it seems impossible.

pp = refer to phases, P being the primary wave (code figures 1-4) and S the secondary wave (code figures 5 to 8).

	1	2	3	4
Phase P	iP very clear trace of P waves.	P and \bar{P} clear	P clear	eP beginning badly defined on trace.
	5	6	7	8
Phase S	iS very clear trace of S waves	S clear	eS beginning badly defined on trace	uncertain

For disturbances near at hand (*i.e.*, when the epicentre is less than 700 km. distant), waves represented by the symbol \bar{P} are noted. These waves travel in a different layer of the earth's crust from P waves and less rapidly. The figure 9 for either P or S indicates that the minute signal interferes with the beginning (the pen which makes the trace on the recording ribbon being out of contact at this moment).

hh, mm, ss are the hours minutes and seconds of the beginning of P.
ttt is the difference in seconds of the times of arrival of the S and P waves, *i.e.* (S-P) in sec.

D_1D_1 is the difference ($\bar{P} - P$) in seconds for close earthquakes ; if this difference is not clear on the trace, D_1D_1 is replaced by 99.

DDD is the distance in kilometres for close earthquakes.

D_1D_1DDD is the distance in kilometres for distant quakes.

NOTE.—The region of the epicentre is given *en clair* whenever possible together with an indication of the intensity of the disturbance.

Example :—2099I 5005I 33393 04830 Turkestan.

Translation : Disturbance on the 20th, azimuth of epicentre not yet determined, iP, iS beginning at oh, 51m. 33s., difference S-P = 393 sec. ; distance 4,830 km. ; epicentre Turkestan.

(2) Reports transmitted by Bordeaux (LY).

Important seismological radio-telegrams (*i.e.*, those in code (c) above) are repeated by Bordeaux on a wavelength of 23,450 m. CW., at the conclusion of the scientific T.S. (rhythmic beats) at 2,000 G.M.T.

AIRCRAFT.

Information with regard to Distress Signals by Day and Night.

Mariners and others are notified that when any aircraft is in distress and requires assistance, the following shall be the signals displayed by her, either together or separately :—

- I. The International Signal "S.O.S." by means of visual or Wireless Telegraphy.
- II. The International Code Signal of Distress indicated by N.C.
- III. The Distant Signal consisting of a square flag having above or below it a ball or anything resembling a ball.

IV. A continuous sounding with any sound apparatus.

V. A signal consisting of a succession of White Very's lights, fired at short intervals.

VI. A white flare from which at intervals of about 3 seconds a white light is ejected into the air.

Note.—The above signals are subject to such modification as shall be published from time to time.

Wireless Navigational warnings to Airmen.

Information of a specially urgent nature concerning aerial navigation *e.g.*, warning regarding the discontinuation of navigational aids or obstruction of landing areas at aerodromes, will be broadcast by W/T from the Air Ministry Station (GFA), in addition to being promulgated in the usual manner. Such notices issued by W/T will be added at the end of the Air Ministry synoptic weather reports transmitted on a wavelength of 4,100 m. C.W. at any of the following times (G.M.T.) daily :—

0600, 0800, 1400, 1900.

FOG SIGNALS.

SPAIN, NORTH-WEST COAST.

Cape Finisterre and Cape Villano—W/T Fog Signals

(1) Cape Finisterre lighthouse : (Lat. $42^{\circ} 53' N.$, long. $9^{\circ} 16' W.$ (*approx.*)).

Wireless fog signals on a wavelength of 1,000 metres are transmitted continuously during thick or foggy weather. The signals consist of a note tuned to 500 vibrations per second, of 0.5 second duration *every* $7\frac{1}{2}$ seconds, thus :—

Sound,	silent interval,
0.5 sec.	7.0 sec.

making in all 8 emissions per minute.

Range of signals.—30 moles.

(2) Cape Villano lighthouse : (Lat. $43^{\circ} 10' N.$, long. $9^{\circ} 13' W.$ (*approx.*)).

Wireless fog signals on a wavelength of 1,000 metres are transmitted continuously during thick or foggy weather. The signals consist of a group of sounds on a note tuned to 600 vibrations per second, *every* 30 seconds, thus :—

Sound,	silent interval,	sound,	silent interval,
1.0 sec.	7.0 sec.	1.0 sec.	21.0 sec.

Range of signals.—30 miles.

UNITED STATES, PACIFIC COAST—CALIFORNIA.

San Francisco Light Vessel—W/T Fog-Signals.

Position.—San Francisco light vessel, lat. $37^{\circ} 45' N.$, long. $122^{\circ} 42' W.$ (*approx.*).

Call signal.—NAKS.

Wavelength.—1,000 metres.

Wireless fog signals are operated daily from 1700 to 1730 and from 2300 to 2330 G.M.T. ; and continuously during thick or foggy weather.

The signals consist of a series of *double dashes every minute*, thus:—

(— — — — — c.), Silent interval,
30 seconds. 30 seconds.

Note.—Vessels equipped with direction finding apparatus can determine their bearing from the light vessel by the above signal.

FREE MEDICAL ADVICE TO SEAMEN BY W/T.

United States-Atlantic and Pacific Coasts.

Through the co-operation of the Seamen's Church Institute of New York with the United States Public Health Service, free medical advice for ships at sea is now available through the undermentioned coast W/T stations on the Atlantic and Pacific coasts of the United States, belonging to the Radio Corporation of America. The names of the hospitals furnishing the service are also designated:—

W/T Stations.	Call Signal.	Position. — Latitude. Longitude.	Hospitals.
Chatham, Mass. ...	WCC	41° 43' N. 70° 46' W.	U.S. Marine Hospital No. 70, 67, Hudson Street, New York. (Alternatively: Hospitals Nos. 38, 43 and 61.)
Siasconset, Mass. ...	WSC	41° 17' N. 69° 58' W.	
New York City ..	WNY	49° 39' N. 74° 00' W.	
Cape May, N.J. ...	WCY	38° 56' N. 74° 56' W.	U.S. Veterans' Hospital No. 49, Gray's Ferry Rd., and Twenty fourth St., Philadelphia. (Alternatively: U.S. Veterans' Hospital No. 56, Baltimore.)
San Francisco (Bolinas)	KPH	37° 54' N. 122° 42' W.	U.S. Marine Hospital No. 19, Fourteenth Avenue and Lake St., San Francisco. (Alternatively: U.S. Veterans' Hospital No. 24, Palo Alto, California.)

Ships desiring medical advice can secure prompt service by communicating with any of the above mentioned W/T stations. The message is to be signed by the master of the vessel, and should state briefly the symptoms of the person afflicted.

The reply containing the medical advice given by the hospital consulted will be sent in plain language (English) and so phrased as to be intelligible to a layman.

This free medical service has been established primarily for the benefit of ships not carrying physicians; however, should occasion arise, wireless consultation may be held by ships' physicians with the hospital staffs through the W/T stations referred to.

The United Fruit Co. has inaugurated a free medical radio service from its hospitals in the various countries of Central America, and from its passenger steamships to all ships at sea. This service is available without charge so far as the United Fruit Co., and subsidiary companies are concerned to ships

of all nationalities through the following radio stations operated by the United Fruit Co., or the Tropical Radio Telegraph Co. :—

<i>Radio Stations</i>	<i>Call Letters</i>
New Orleans, Louisiana	WNU
Burrwood, Louisiana	WBW
Fort Morgan, Alabama	WIO
Swan Island, Caribbean Sea	US.
Tela, Honduras	UC.
Puerto Castilla, Honduras	UA.
Tegucigalpa, Honduras (open November, 1922) ..	UG.
Port Limon, Costa Rica	UX.
Almirante, Panama	UB.
Santa Marta, Columbia	UJ

Radiograms should be signed by the Captain of the ship and should state briefly but clearly the symptoms of the person afflicted. Such radiograms should be addressed "Unifruitco" (name of place) and may be sent to any of the United Fruit Co.'s hospitals listed below :—

- Santa Marta, Columbia.
- Port Limon, Costa Rica.
- Almirante, Panama.
- Tela, Honduras.
- Puerto Castilla, Honduras.
- Puerto Barrios, Guatemala.



DIRECTION FINDING

- (A) **Résumé of Progress and Practice**
- (B) **Regulations and Procedure Relating to
Direction Finding of the Countries
of the World**

MODERN PROGRESS IN RADIO DIRECTION FINDING

By R. L. SMITH-ROSE, M.Sc., D.I.C., A.R.C.S., A.M.I.E.E.

INTRODUCTORY.

ALL modern systems of radio direction finding owe their successful development on a practical scale to the thermionic vacuum tube; since without the use of the amplifying properties of this device, the range of reception of closed circuit coil receivers is very limited. This is probably the sole reason that the early work of Hertz, Fessenden, Pickard, and Round in demonstrating the directive properties of the single closed loop receiver was followed by no immediate application. Although it was actually devised from a different stand-point, the Bellini-Tosi system is in effect identical with a large closed loop, utilising an instrument to produce a secondary field with similar directive properties to those of the original incoming waves. Chiefly on account of its larger dimensions and consequent greater power of absorbing energy from an electromagnetic wave, its range of reception was reasonable, and it had thus attained to commercial proportions prior to 1914.

THE THREE "ZERO" SYSTEMS OF DIRECTIVE-RECEPTION.

The Bellini-Tosi System. (Fixed Aerials).

This system will be dealt with first, because for the reason just given, it was the first to attain practical proportions although it was actually second in order of invention. This system utilises two large loops, fixed with their planes vertical and perpendicular to each other. The E.M.F's. induced in these loops, varying in magnitude according to the angle between the plane of each loop and the direction of the magnetic field of the incoming wave, cause currents in two small coils fixed together at right angles; the circuit formed by each loop and its corresponding coil may be tuned, by condensers, or left untuned. The currents flowing in these two coils produce a resultant magnetic field within them, which has a direction relative to the coils exactly corresponding to the direction of the magnetic field of the wave relative to the loops. The absolute direction of this secondary field, and hence of the incoming waves, may then be determined by a small rotating search coil which will give zero signal intensity in the telephones of the receiver to which it is connected when the plane of the coil coincides with the direction of the secondary magnetic field.

As an alternative to the setting of the coil to the zero signal position, it may be quickly swung between two points to give equality of signal strength. In this case the true direction or bearing is midway between the two points so found. In practice this latter mode of operation is almost universally employed, since the zero may be somewhat ill-defined or may extend over several degrees, due to various disturbing effects and weak signals respectively. With the introduction of the triode amplifier, the range of reception of this system was greatly increased, but only in comparatively minor points was the arrangement altered. The modern instruments are provided with a far greater wavelength range than formerly and the circuit arrangement has been somewhat simplified to give easier operation and freedom from certain instrumental errors. On these general lines, types of this system have been fully developed by the Marconi Company for use on land, on board ship, and for experimental purposes, on aircraft. By utilising the "open aerial" receptive properties of the loops employed, in addition to their directive properties, this system now enables not only the plane of reception, but the actual sense of the incoming waves, to be determined.

The Single Frame System.

With the gradual development of triode amplifiers it was found that quite reasonable reception ranges could be obtained with the original type of vertical closed loop, tuned to resonance with a suitable condenser. Such a loop if easily rotatable about a vertical axis can be used as a direction finder

by simply placing it in the position of zero signal reception when its plane will be perpendicular to the direction of the incoming waves. By the use of several turns of wire in place of the single-turn loops previously employed, practically the same energy reception could be obtained with loops of much smaller area. On these lines a direction finder was developed employing a single-frame coil of size as small as 2 or 3 feet square.

Although some work on this type of instrument has been carried out in this country its development has been chiefly confined to France and America. More especially in the latter country it has been made the subject of concentrated research, and a very successful type has been produced for use both on land and on board ship. The instrument is operated upon a minimum or zero of signal strength, and in the taking of bearings the whole coil is usually swung through the minimum in precisely the same way as the search coil of the former instrument is used. In the use of a radio direction finder on board ship, the readings of the instrument are necessarily dependent upon the direction of the head of the ship, and suitable adjustment must be made for the latter, obtained from the ship's compass. A convenient modification of the single coil in this case is to mount it immediately over the binnacle and arrange its pointer to move over the compass card, from which true radio bearings may then be read. By arranging suitable connections on this set also, the sense of the bearing can be indicated in addition to its plane direction.

The Robinson Crossed-Coil System.

In attempting to take a radio bearing in the presence of large external noise, the two previous systems become very difficult to operate accurately on account of the obscuring of the minimum by the interference. The remedy which is adopted in such cases is to swing the coil or loop through a comparatively large angle to obtain a distinctly audible signal under the prevailing conditions. In the Robinson system, however, an accurate observation of bearing may be made on an audible signal without the necessity of swinging the moving system. The usual type of this instrument employs two frame coils fixed together at right angles and rotating about their common vertical axis. The two coils are connected in series through a reversing switch to a variable condenser to tune the coil system to the incoming waves. According to the position of the switch the E.M.F. in one of the coils is either added to or subtracted from that in the other coil, so that in general a change of signal strength in the telephones results from the operation of the switch. When, however, the coil system is so set that the plane of one of the coils is perpendicular to the direction of the incoming waves, there will be no such change in signal intensity. A slight rotation of the coils in either direction will disturb this balance, and the direction of the incoming waves can thus be determined. The possible 90° ambiguity which might otherwise occur is eliminated by making one of the coils of much greater area-turns than the other, a factor which also increases the sensitivity of the instrument.

Consideration of the theory of this arrangement shows that the two coils perpendicular to each other are equivalent to a single coil of calculable dimensions and set at an angle intermediate between them. The operation of the reversing switch is equivalent in effect to the sudden rotation of this resultant coil through the minimum position of one of the component coils. The angle of swing is determined by the ratio of the area-turns of the component coils and so is fixed for any one instrument. In typical instruments of this type this angle is equal to 20° or 30° for good sensitivity. It is thus evident that this system is in effect equivalent to a single frame coil, which in the presence of considerable interference is swung through the minimum over 20° or 30° for the comparison of equality of signal strength.

THE ERRORS OF DIRECTIVE RECEPTION.

The preceding section is briefly descriptive of the three principal systems of directional radio reception, which crystallised from the large amount of

research carried out up till about 1918. Since that date the work on this subject has been almost confined to the gaining of practical experience in its application to navigation and other problems, and the increase of scope, accuracy and ease of operation of the instruments. Above all things a knowledge of the limits of accuracy of the systems under all conditions is necessary, and it is now proposed to treat this subject under the headings of (a) Instrumental errors, (b) Errors due to local surroundings, (c) Variable errors. It is to be remarked that since each of the systems employed depends upon the setting of part or all of the moving system in a position of zero signal strength, it is to be expected that errors (b) and (c) will affect each system to the same extent, other things being equal. This theoretical deduction has recently been verified experimentally by the author in an investigation, an account of which is shortly to be published.

(a) *Instrumental Errors.*

One of the largest instrumental errors to which the earlier types of apparatus were subject was due to mutual interference, inductive or capacitative, between the fixed and moving portions of the apparatus. The errors due to this cause usually increased with decrease of the wavelength used and varied with the direction of the incoming waves, while the use of multi-valve amplifiers to give increased receptive range certainly augmented the possibility and magnitude of these errors. The bad reputation which was earned for direction finding on continuous waves has been found to be almost entirely due to the errors introduced by inductive interference between the local oscillator employed and the moving system. All these errors can be avoided by judicious arrangement of the apparatus and particularly by adopting efficient methods of screening the various components employed. Electro-magnetic screening enters very largely into a successful direction finding installation as well as in other radio work, and it has recently been made the subject of much experimental research. The enormous sensitivity of modern apparatus requires very much more stringent precautions than were necessary formerly, and the mere use of a so-called Faraday cage is no longer sufficient. An efficient screen or shield to any piece of apparatus for ordinary purposes consists of a complete conductively closed metallic envelope, preferably of sheet iron and of a suitable thickness for the frequency employed. All apertures and movable portions of the envelope necessary for the adjustment of the apparatus within, should be reduced to the minimum.

Another common error in all direction finding instruments is that known as "antenna" effect. This arises from the tendency of the vertical loop or frame to behave as an ordinary open antenna in addition to its directive properties, and combined with the difference in capacity to earth of the grid and filament respectively of the first triode to which the movable coil system is connected, directly or otherwise. The most complete method of eliminating this error is to employ a small variable or "compensating" condenser, connected between the grid and earth, and adjusting it until the total capacity is exactly equal to that from filament to earth. This adjustment is carried out while the bearing is being obtained, and exact compensation is easily detected by the greatly increased sharpness of the zero signal which results. Unfortunately, this adjustment requires to be renewed for at least each change in wavelength, and hence somewhat retards the observation of bearings when searching over a range of wavelengths. An alternative method of nearly eliminating the error of "antenna" effect without the disadvantage just mentioned, is the placing of an earthed "capacity" plate either at a suitable point in the apparatus or else symmetrically over the top horizontal side of the receiving loops. A third method of overcoming the difficulty and also of avoiding any error due to the direct reception of signals on the connecting leads of the apparatus is to enclose the whole of the receiving apparatus, except the loops, inside an efficient metallic screen connected to earth. This latter arrangement has advantage in also screening the operator, who may otherwise contribute not a little to the antenna effect.

With the elimination of the two errors above described most of the difficulties experienced in the early days of direction finding due to a slight mistuning of the coil system have disappeared, although naturally to obtain the best conditions, all the tuned circuits involved are tuned as accurately as possible. In the Bellini-Tosi system exact identity of the electrical constants of the aerial circuits is required, and for ease of operation it is usual in practice nowadays to employ untuned aerials and obtain the necessary selectivity at other points in the circuit.

Other instrumental errors such as those due to the scale and the effect of the coil-shape are more a matter of design and accurate construction. On the whole it may be said that using precautions which are evident in the light of modern knowledge, the instrumental errors of the direction finding systems may be reduced to a quantity which is negligible compared with other errors which are at present beyond control.

(b) Errors due to local surroundings.

Much quantitative knowledge has been obtained during the last two or three years upon the effect of various surrounding objects on a radio direction finder. This knowledge is undoubtedly invaluable to those having the responsibility of erecting such installations on land and in some cases on board ship. To give even a summary of this data is beyond the scope of the present article, but a brief review may be given of the effects observed. In the majority, if not in all, instances, the effect on the direction finder is a secondary one due to the distortion of the field of the arriving waves by the currents set up in the disturbing objects.

Masses of metal-work commence to have a serious effect upon the readings of a direction finder when their dimensions become comparable with the coils of the latter concerned. With increasing size of the metal-work, the errors in reading become greater and the strength of the signals received is appreciably reduced. A somewhat rough rule which is, however, a useful guide in selecting sites, is that a metallic mass will not produce any serious effect on a direction finder if it is placed at a greater distance than its largest linear dimensions. In some of the author's experiments, errors ranging up to nearly 30° were produced by a small frame coil used in the neighbourhood of a large iron shed. An instance in which these errors due to metal-work are not easily avoided is that of working on board ship. In this case the hull and distributed metal-work produce an error of a quadrantal nature which may have a maximum value ranging from 10° to 30° . Fortunately, this error is independent of wavelength and by adopting reasonable precautions may be kept constant, so that a calibration curve may be made for the direction finder after its installation. By analogy with that of a ship it will be appreciated that any metal-work underground may produce serious errors at a land installation.

Tuned aerials, long stretches of overhead wires and trees may each be responsible for errors on a direction finder within several hundred feet, so that a comparatively clear site on land is essential for successful working. Sudden changes in the conductivity of the ground, such as in passing from sea to land, also produce errors in the observed directions of waves, which are however only appreciable on wavelengths below 2,000 metres.

(c) Variable errors.

If, at any installation, the errors mentioned in the two previous sections cannot be entirely eliminated they can usually be rendered fairly permanent in their effects and hence a previous calibration may be used to correct all bearings observed. There is now to be mentioned another class of error, which is extremely variable both from day to day and especially during the night. The existence of this class of error is only appreciated by taking repeated observations upon stations the true direction of which is known. The variations then experienced are so erratic in their nature that no definite law concerning them has yet been formulated and no method of eliminating them or compensating for them has yet been devised.

Considering the frequency with which this class of error is met with on any system of direction finding, the quantity of data which has been made public is comparatively small. Observations on a large scale are now in progress in several parts of the world, and the author has been largely concerned with the work in this country, being carried out under the auspices of the Radio Research Board.

Day Variations.

Definite variations in observed bearings take place in daylight, which cannot be ascribed to instrumental or observational errors. In some cases these may be due to changes in the conductivity of the ground, due to moisture, giving a variation in the error mentioned in the last paragraph of (b) above. On other occasions, however, variations from day to day take place under identical weather conditions. The magnitude of these variations is not usually large in daylight, the greatest difference from the mean amounting to about three or four degrees.

Night Variations.

When night conditions prevail over the portion of the earth between a transmitter and receiver, the variations assume a magnitude and frequency which make any radio bearings very unreliable. The general nature of night variations is very complex and their magnitude ranges from 10° to at least 60° . In some cases a practically steady deviation takes place for a considerable time; on other occasions observed bearings alter at the rate of several degrees per minute. The variations appear to depend upon a large variety of conditions from the transmitter to the receiver and from the surface of the earth up to the top of the atmosphere. Apparent laws have been made upon a few scattered readings only to be disproved by further continued observation. Variations observed at one portion of the earth appear to be quite different from those at another place at the same time and under exactly similar conditions. Observations made simultaneously at the same place on different transmitting stations frequently give errors which totally disagree among themselves.

The salient point which has arisen out of the work already carried out is that radio direction finding over any appreciable distance at night is very unreliable for navigation or other purposes. There is at present no certain means of determining whether any observed bearing is correct or otherwise at the time of recording. Much discussion of a theoretical nature has taken place on this subject, but even accepting the assumptions upon which this is based, no theory yet explains all the variations which have been observed. Many attempts have been made to avoid or eliminate these errors but so far without success. The wisest course to adopt in these circumstances seems undoubtedly to be to reserve opinions until sufficient accurate quantitative data, embracing as far as possible all conditions, is available for the testing and checking of the theories. Whatever may be the outcome of this and its effect on the present practice of radio direction finding, it will also undoubtedly add very materially to the knowledge of the more general problem of the transmission of electro-magnetic waves over the earth's surface, and so will benefit the theory and practice of radio communication in general.

DIRECTIONAL TRANSMISSION.

(i) *Closed Loop Radiators.*

The general law of radiation, viz., that a good absorber of electromagnetic waves is also a good radiator, holds equally for radio frequencies as for those of heat and light radiation. It will, therefore, be understood that a closed frame coil supplied with the necessary electrical power will radiate waves having similar distribution to the receptive properties of the coil. If the plane of the coil is vertical the radiation in different directions in a horizontal plane passes through a sharp zero in the direction of its axis. Hence, if the coil radiator is arranged to rotate about a vertical axis, the signal received at a distant station will pass through a sharp minimum, as the plane of the coil

passes through the position of perpendicularity to the line joining the two stations. If the transmitting station be arranged to send out a code signal when the coil is in some definite geographical direction, an observer at any receiving station can obtain the direction of the incoming signals by a simple time observation. This system possesses the advantage that any receiving station using any kind of antenna may obtain bearings by means of a stop watch, while the disadvantages for navigation purposes are that the observations are limited to those on the special directive transmitting stations, which latter also must be maintained in continuous operation, a somewhat bad feature from the point of view of interference. One modification of the simple rotating loop which has been in operation, is a series of large fixed loops spaced about a common axis, with a rotating switch interchanging the connections of each loop in turn. Other modifications that also have been used in at least the experimental stage are inversions of the Bellini-Tosi and Robinson systems respectively.

On the whole it cannot be said that these methods have led to great success so far for practical direction finding. The radiated energy from closed loops is comparatively small for any appreciable distance, and is necessarily limited by the power that can be fed to the loop. From the point of view of accuracy, also, it is doubtful if there is anything to gain over the directive receiver. The instrumental errors are practically entirely transferred to the transmitter, while any deviations suffered by the waves *en route* will also exist to the same extent.

While not denying the possibility, sufficient evidence is not yet available to state whether the abnormally large variations in bearings will still be present when using directive transmission.

(ii). *Rod Oscillators with reflectors.*

In the early days of radiotelegraphy, attempts were made to use reflectors to concentrate the radiated waves in the required direction, from the view of economy rather than for any direction-finding applications. On account of the increased wavelengths employed to obtain the necessary power, the corresponding size of such mirrors became impracticable. That most useful device in modern radio, the triode vacuum tube, has, however, provided a means of generating short wavelengths of 20 metres or less in quite appreciable powers. Demonstrations of remarkable experiments in this direction by Marconi and Franklin have been recently given in both this country and America. Using a simple Hertzian rod oscillator coupled to a small triode generator, waves of as short as 1 or 2 metres are produced, and these are easily concentrated into a parallel beam by means of a parabolic reflector. The fundamental properties of electromagnetic waves are easily demonstrated in experiments which are very reminiscent of the classical researches of Hertz.

In the practical use of these waves, it will be evident that no receiver which is not within the limits of the beam will give any response. This provides in effect partial secrecy to any communication carried out in this manner; and although atmospheric absorption becomes very large at these short wavelengths, successful telephone transmission has been carried out over distances exceeding 60 miles using reflectors at each end. For directive purposes an oscillator is set up with its parabolic reflector and arranged to rotate about a vertical axis. A radio beam is thus sent out, which sweeps over the 360° in a horizontal plane, in exactly the same way as the visible beam from a lighthouse rotates. Using a rod receiver and suitable detecting apparatus, the flashing of the beam past any distant object, *e.g.*, a ship, may be detected. It is then an easy matter for code signals to be sent out from the transmitter which indicate at every few degrees the precise direction of the beam. Experiments on these lines have already been carried out using a 4-metre wave and a revolving reflector. With a single valve receiver on board a ship, a working range of seven nautical miles was obtained, bearings being determined to within 3° .

LAWS, REGULATIONS AND PROCEDURE RELATING TO DIRECTION FINDING

Note.—Special regulations affecting aircraft for direction and position finding, in addition to those printed below, are contained in the Aviation Section.

THE following is an extract of the Laws, Regulations and Procedure adopted by the various countries of the world and obtained in some instances from publications issued by them.

Wireless direction-finding stations (W/T D.F.) are either existing wireless telegraph stations or stations especially constructed for the purpose on shore, which are equipped with apparatus enabling them to ascertain the direction from which wireless signals transmitted by other stations emanate, and particularly from ships at sea.

The procedure to be generally adopted varies to some extent with different stations, both regarding the wavelength to be used and the general procedure for requesting and acknowledging bearings. In general, a ship requiring its position calls up a direction-finding station or stations either singly, or as is often the case when one station controls one or more others, collectively, requesting, in the proper procedure laid down, its position. The station or stations called again in proper procedure, reply with the true bearing of the ship from that station. The accuracy of these bearings so obtained depends largely on certain conditions which are outlined below, but generally speaking, they can be considered accurate to within two degrees.

Administrations of the various countries controlling such direction-finding stations accept no responsibility for the consequences of any bearing being inaccurate, but where three direction-finding stations can be employed suitably situated to give intersecting bearings, almost complete reliance can be placed on the results so obtained, provided that the triangle of error ("cooked hat") formed by the intersection of bearings is small.

To obtain the greatest possible degree of accuracy, it is important that the ship station should use low power to transmit. Signals should be fairly strong and clear, and the signal strength be kept steady with strict attention to spacing. Any instructions for procedure given by the countries in which direction-finding stations are situated should be strictly adhered to.

In direction finding there is always a possible error of 180° . Darkness, fog, stormy weather and coast line errors have also to be taken into account. Nothing should be left to chance when obtaining bearings; every possible precaution should be taken to ensure their accuracy.

It is expected that before long an international agreement will standardise the procedure to be adopted for the requesting and giving of bearings and the wavelengths to be used for such communications. Meanwhile, each country has rules and regulations governing the use of its own direction-finding stations.

There are three systems of direction finding at present operating, viz. :—

- (a) Where each direction finding station is fitted with transmitting and receiving apparatus and works independently.
- (b) Where several direction finding stations (usually situated near a harbour entrance or difficult passage) are linked together by special telegraph cables and are all controlled by one telegraph station, which alone is fitted with transmitting apparatus. Controlling stations in such cases are usually not direction finding stations at all, but the ordinary coast stations.
- (c) Where a ship requires a single bearing only. In this case the vessel calls the wireless stations nearest to the direction finding station, which calculates the bearing, and it is then transmitted by the wireless station.

A large number of ships are now fitted with direction finding apparatus and can obtain their own position by operating on one or more fixed position transmitting stations. In such cases the ship is, of course, independent of

shore direction finding stations and can obtain its position at more or less any point of the globe.

Direction finding is also being considerably developed in regard to aviation particularly with the cross-channel airways. It has, on several occasions, in adverse weather conditions, been exceedingly useful and is getting to be more and more to be relied upon. With aircraft direction finding is usually carried out by means of radiotelephony. The position can normally be given within two minutes. In the case of both ship and air vessels, direction finding should be practised in clear weather, in order that proficiency and reliability may be obtained.

FIXING POSITION BY WIRELESS DIRECTIONAL BEARINGS.

(N.B.—The W/T stations referred to in this article are fictional.)

I.—GENERAL.

Fixing position by directional wireless is very similar to fixing by cross bearings from visible objects, the principal difference being that, when using a chart on Mercator's Projection, true bearings have to be changed into mercatorial bearings, the wireless stations being generally at very much greater distances than the objects used in an ordinary cross bearing fix.

Although fixing position by wireless directional bearings is dependent for its accuracy upon the degree of precision with which it is at present possible to determine the direction of wireless waves, subsequent confirmation of the course and distance made good, by the receipt of additional bearings, would afford confidence to those responsible in the vessel as the land is approached under weather conditions that preclude the employment of other methods.

At the present time, from shore stations with practised operators and instruments in good adjustment, the average error in direction should not exceed 2° for day working, but it is to be noted that errors at night may be larger, although sufficient data on this point is not at present available.

III.—CONVERGENCY.

Meridians on the earth's surface not being parallel but converging towards the poles, it follows that a great circle will intersect meridians as it crosses them at a varying angle. The difference in the angles formed by the intersection of a great circle with two meridians (*i.e.*, convergency) depends on the angle the great circle makes with the meridian, its middle latitude between the meridians, and the difference of longitude between the meridians.

This difference is known as the convergency, and can be approximately calculated from the formula:—

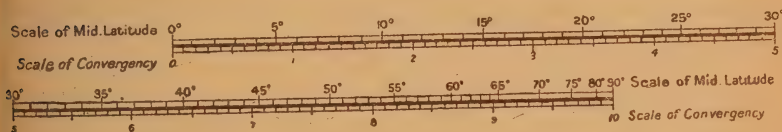
Convergency in mins. = diff. long. in minutes $\times \sin$ mid. lat.

Convergency may be readily found from the Convergency Scales (Fig. 1) or it may be found by traverse table entering the D. long. as distance and mid lat. as course; the resulting departure being the convergency in minutes

IV.—TRUE AND MERCATORIAL BEARINGS.

Meridians on a Mercator's chart being represented by parallel lines, it follows that the *true bearing* of the ship from the station, or *vice versa*, cannot be represented by a straight line joining the two positions, the straight line joining them being the *mean mercatorial bearing*, which differs from the true bearing by $\pm \frac{1}{2}$ the convergency. As it is this mean mercatorial bearing which we

Scales for obtaining the Convergency for 10' Diff. Longitude in different Latitudes



Example:— Mid Lat. 50°30', diff. long. 282; To find the Convergency.
Under 50°30' on Mid. Lat. scale read 7.7 on scale of Convergency
which multiplied by 28.2 gives 217" the Convergency

Fig. 1.

II.—TRACK OF WIRELESS WAVE.

The track of a wireless wave being a great circle is represented on a chart on Mercator's Projection by a flat curve, concave towards the equator; this flat curve is most curved when it runs in an east and west direction, and flattens out as the bearing changes towards north and south. When exactly north and south it is quite flat and is then a straight line, the meridian. The true bearing of a ship from a W/T station, or *vice versa*, is the angle contained by the great circle passing through either position and its respective meridian.

require, all that is necessary when the true bearing is obtained from a W/T station is to add to or subtract from it $\frac{1}{2}$ the convergency and lay off this bearing from the station.

V.—SIGN OF THE $\frac{1}{2}$ CONVERGENCY.

Provided the bearings are always measured in degrees North 000° to 359° (clockwise) the sign of this $\frac{1}{2}$ convergency can be simply determined as follows:—

N. lat. .. $\frac{1}{2}$ convergency is + to the bearing given by the W/T station when ship is E. of station.

N. lat. ... $\frac{1}{2}$ convergency is — to the bearing given by the W/T station when ship is W. of station.

S. lat. ... The opposite.

When the W/T station and the ship are on opposite sides of the equator, the factor $\sin \text{mid. lat.}$ is necessarily very small and the convergency is then negligible. All great circles in the neighbourhood of the equator appear on the chart as straight lines, and the convergency correction as described above is immaterial and unnecessary.

VI.—EXAMPLE.

A ship is by D.R. in lat. $48^{\circ} 45' \text{ N.}$, long. $25^{\circ} 30' \text{ W.}$, and obtains wireless bearing from Sea View $244\frac{1}{2}^{\circ}$ and from Ushant $277\frac{1}{2}^{\circ}$. What is her position?

Sea View Lat. $55^{\circ} 22' \text{ N.}$ Long. $7^{\circ} 19\frac{1}{2}' \text{ W.}$
D. R. „ $48^{\circ} 45' \text{ N.}$ „ $25^{\circ} 30' \text{ W.}$

Mid. lat. $52^{\circ} 03' \text{ N.}$ Diff. long. $1090.5'$
Convergency = $1090.5' \times \sin 52^{\circ} = 859'$
or $\frac{1}{2}$ convergency = $7^{\circ} 09'$

The true bearing signalled by Sea View was $244\frac{1}{2}^{\circ}$, as ship is west of the station (North lat. see paragraph V.), the $\frac{1}{2}$ convergency will be “minus” to the true bearing signalled.

Lat. $48^{\circ} 27\frac{1}{2}' \text{ N.}$, long. $25^{\circ} 05' \text{ W.}$, which is the ship's position.

Note.—In plotting the positions the largest scale chart available that embraces the area should be used. A station pointer will be found convenient for laying off the bearings where the distances are great.

The chartlet (Fig. 2), drawn on the Mercator's Projection shows the above positions and the error involved by laying off the true bearings as signalled from Sea View W/T and Ushant W/T.

The solid lines are the great circles passing through Sea View and ship's position and Ushant and ship's position.

The pecked lines are the true bearings laid off as signalled, their intersection (B) being in lat. $50^{\circ} 14' \text{ N.}$, long. $25^{\circ} 46' \text{ W.}$, or approximately $110'$ from the correct position.

The dotted lines are the mean mercatorial bearings laid off from Sea View and Ushant and their intersection (C) gives the ship's position very nearly, i.e., lat. $48^{\circ} 27\frac{1}{2}' \text{ N.}$, long. $25^{\circ} 05' \text{ W.}$

Position A is the ship's D.R. position, lat. $48^{\circ} 45' \text{ N.}$, long. $25^{\circ} 30' \text{ W.}$, which was used for calculating the $\frac{1}{2}$ convergency.

Note.—As the true position of the ship should

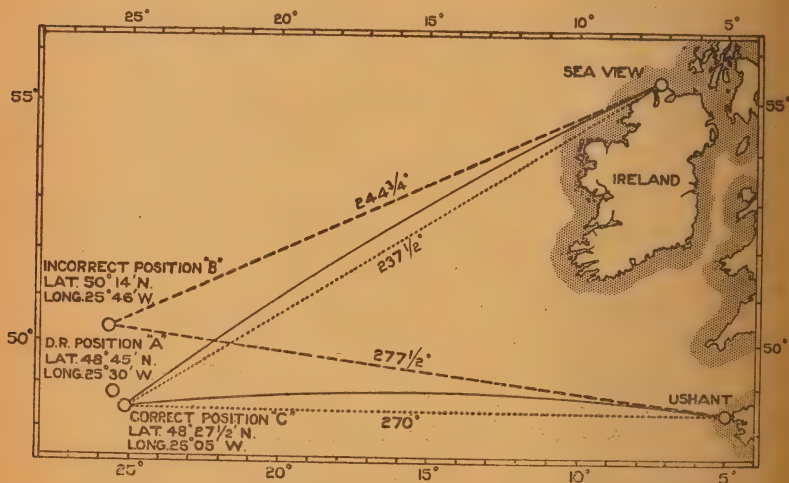


Fig. 2.

Therefore the mercatorial bearing will be $237\frac{1}{2}^{\circ}$ nearly.

Similarly with Ushant.

Lat. D. R. $48^{\circ} 45' \text{ N.}$ Long. $25^{\circ} 30' \text{ W.}$
„ Ushant $48^{\circ} 26\frac{1}{2}' \text{ N.}$ „ $5^{\circ} 05\frac{1}{2}' \text{ W.}$

Mid. lat. $48^{\circ} 36' \text{ N.}$ Diff. long. $1224.5'$
Convergency $1224.5' \times \sin 48^{\circ} 36' = 919'$
or $\frac{1}{2}$ convergency = $7^{\circ} 40'$

The true bearing signalled by Ushant was $277\frac{1}{2}^{\circ}$, as ship is west of the station (North lat. see paragraph V.), the $\frac{1}{2}$ convergency will be “minus” to the true bearing signalled. Therefore the mercatorial bearing will be 270° nearly.

Laying off $237\frac{1}{2}^{\circ}$ and 270° on the chart from Sea View and Ushant respectively the intersection will be in:

have been used to obtain the $\frac{1}{2}$ convergency the quantity found is not correct, but it could be recalculated using lat. and long. (c) and a more correct value found. This, however, is only necessary if the error in the ship's assumed position is very great.

VII.—ACCURACY OF THIS METHOD OF PLOTTING.

Although this method is not rigidly accurate, it can be used for all practical purposes up to 1,000 miles range, and a very close approximation found to the position lines upon which the ship is at the moment the stations receive her signals.

VIII.—USE OF W/T BEARINGS WITH OBSERVATIONS OF HEAVENLY BODIES.

It follows that W/T bearings may be used in conjunction with position lines obtained from

observations of heavenly bodies, the position lines from the latter being laid off as straight lines (although in this case also they are not strictly so), due consideration being given to the possible error of the W/T bearings. Moreover, W/T bearings can be made use of at short distances as "position lines," in a similar manner to the so-called "Summer line" when approaching port, making the land, avoiding dangers, etc.

CANADA

Direction finding wireless stations are maintained by the Dominion at St. John, N.B., Chebucto Head, N.S., Canso, N.S., and Cape Race, Newfoundland. These are of the Bellini-Tosi type, stationary aerial. All bearings are given on the 800 metre wave. For the present no charge is made for bearings supplied.

1. A ship wishing to obtain her bearings should call the D.F. station required on 800 metres and transmit the signal QTE? using commercial procedure as follows:—

EXAMPLE:

Ship (call sign CHR) calls up station required (call sign VAV):—

— • • • — VAV VAV VAV — • • • CHR
CHR CHR QTE? — • • • —

The D.F. station on acknowledgment the receipt of the signal QTE? will say whether it is ready to take the bearing at once, or whether the ship is required to wait.

If the D.F. station is ready to take the bearing, it will make:—

CHR R QTE VAV — • • •

2. On receiving this acknowledgment of the signal QTE? and the signal — • • • (go) the ship will make: — • • • — etc. (— • • • — repeated 30 times) — • • • — CHR.

3. If the D.F. station is not satisfied with the bearing it will make — • • • — to the ship, which will repeat — • • • — 20 times (as above); otherwise the D.F. station does not answer until the bearing has been worked out, when the station will immediately call the ship and transmit the TRUE bearing of the ship from the station in degrees from 000° to 359°, in Government message form, all angles being measured clockwise from true North (000°).

4. Should a ship be within range of and wish to obtain her bearings from more than one D.F. station, she should, if possible, call up the individual stations required, and carry out the above procedure simultaneously with all stations in order to avoid undue interference.

5. Well tuned, clear signals, of medium or fair strength are essential for accurate direction finding. The D.F. station will, if necessary, direct the ship to increase or decrease power so that signals are not stronger than desirable. Care must be taken to keep the note and strength of signals steady, and pay proper attention to spacing. The sharper the tuning, the more accurate will be the bearing; therefore, coupling should be as loose as possible, consistent with the required strength of signals.

6. It must be understood that D.F. station bearings are susceptible to errors at night, and also when the bearing lies roughly along the coast line.

Under normal conditions errors are not likely to exceed 2°.

If conditions are such that the error may exceed 1°, then the bearing will be given as approximate, this being denoted by the suffix

IX.—CONVERSE METHOD.

When ships are fitted with apparatus by which they record the wireless bearings of shore stations whose positions are known, the same procedure for laying off bearings from the shore stations can be adopted; but it is to be remembered that in applying the $\frac{1}{2}$ convergence to these bearings it must be applied to the converse way, in both hemispheres, to that laid down in paragraph V.

"app" to the bearing, e.g., "App 148 degrees." The error in these approximate bearings is not likely to exceed 4°, and will generally not exceed 2½°.

Ships should note that a D.F. station cannot distinguish between the bearing of the ship and its reciprocal, unless the reciprocal bears inland. In the case of doubt, the station will give the ship the two possible angles from true North the decision being left to the ship as to which is her correct bearing. When two angles are given they will not necessarily differ by the theoretical 180°, since there may be deviation corrections applied by the D.F. station, which vary slightly at opposite points of the compass.

7. With a view to checking up the work of D.F. stations, a record of the actual position of a ship at the time a bearing has been obtained will be of the greatest assistance to the department, and if the circumstances are such that the ship's officers can determine fairly accurately by back reckoning or otherwise, such position a brief report should be forwarded to the Canadian Government Wireless Inspector at the nearest Canadian port at the first opportunity, containing:—

- (a) Name of ship.
- (b) Name of D.F. station.
- (c) Date and G.M.T. at which bearing was given.
- (d) Bearing given by D.F. station.
- (e) Estimated position or bearing of ship at above time and date by methods other than D.F. bearings.
- (f) The probable degree of accuracy of the above-mentioned estimated bearing or position.
- (g) Weather conditions at above time.
- (h) Remarks, if any.
- (i) Signature of Master or responsible Navigating Officer.

Forms for this purpose may be obtained upon request from the:—

Deputy Minister, Department of the Naval Service, Ottawa, or from the Government Wireless Inspectors at:—

H.M.C. Dockyard, Halifax.
Old Custom House, 1, Common Street Montreal (during summer).
Old Post Office Building, St. John, N.B. (during winter).

8. The operator must not ask for a bearing except when instructed to do so by the master of the vessel.

9. No charge will be made by the Canadian Government for the above service until further notice.

FRANCE AND ALGERIA

Acts and decrees affecting direction finding are to be found under France and Algeria in the Laws and Regulations Section.

A.—Low Power W/T D.F. STATIONS.

1. French low power W/T D.F. stations keep watch on a wavelength of 600 metres (damped), which must be used for calling by ships desirous of obtaining their bearings.

The D.F. station called replies on the same wave.

The bearing wave (*i.e.*, the wave on which the ship transmits the signal permitting the station to make the observation for the bearing) is either 800 metres or 450 metres, at the option of the ship. The wavelength of 600 metres can be used by ships which cannot transmit either on 450 or 800 metres.

The result of the observation is transmitted by the D.F. station on the same wavelength. Toulon and Casablanca, however, always transmit the result on 800 metres, whatever the bearing wave may be.

2. The abbreviations used are:

QTE?—What is my true bearing relatively to you (or to)?

QTE—Your true bearing relatively to me (or to) is

The bearings are indicated by a number consisting of three figures. They are reckoned from 000 to 359 clockwise, thus: North=000°; West=270°.

3. A ship desires to obtain bearings from a single station or simultaneously from several stations.

The procedure to be observed is as follows:

(a) The ship calls the station (or stations) on the 600 metres wave, and transmits the signal "QTE?" followed by the call signals of all the stations from which he requires observations, and a number indicating the wavelength to be used. She then listens on 600 metres.

(b) The D.F. stations called prepare to take the bearings, and, when ready, reply in the alphabetical order of their call signals, directing the ship by the signal K to commence transmission; this signal is followed by a figure giving the intensity of the signal (scale=1 to 9) to be made by the ship.

(c) On receiving the signal K the ship adjusts her transmitting gear accordingly, and sends her own call signal for 50 seconds. She then listens on the same wave.

(d) The stations, replying in the alphabetical order of their call signals, give the results of their observations by the signal QTE followed by a group of three figures indicating the bearing; or may, if necessary, ask the ship to repeat the preceding message.

EXAMPLE.

A ship ABC requires bearings from the D.F. stations Brest—Moulin du Seigneur (FEI) and Ouessant—Pen-ar-Roch (FEO), on a wavelength of 450 metres.

The various operations are effected in the following order:

(a) ABC calls on 600 metres the two stations:

VE FEI FEI FEO FEO V ABC QTE?

FEI FEO 450 AR.

ABC having transmitted this signal listens on 600 metres.

(b) FEI replies on 600 metres:

VE ABC V FEI 450 K 6

FEO replies on 600 metres:

VE ABC V FEO 450 K 7

(c) FEI and FEO adjust their receiving apparatus to 450 metres.

ABC also adjusts her receiving apparatus to 450 metres, and signals:

VE FEI FEO V ABC ABC ABC.....(for 50 seconds) AR

ABC then listens on 450 metres.

(d) Both shore stations having made the necessary observations, find that at 1545 G.M.T. (civil):

FEI 330° FEO 070°

FEI thereupon signals on 450 metres:

VE ABC V FEI 1 BT 1545 QTE 330 AR

FEI

ABC acknowledges receipt by making:

VE FEI V ABC R II VA

FEO then signals on 450 metres:

VE ABC V FEO 3 BT 1545 QTE 070

AR FEO

ABC acknowledges receipt by making:

VE FEO V ABC R II VA

All stations concerned after repeating VA resume their normal service.

NOTE.—(1) The figure 1 and 3 before the signal BT give the registered number of the bearing on the station register; 1545 refers to the civil mean time of the meridian of Greenwich (the first two figures representing the hours, and the last two the minutes).

(2) If one of the stations (*e.g.*, FEO) desires to repeat the message the bearing not having been made correctly at the first transmission, it makes the signal:

VE ABC V FEO UD

The ships again repeats her call signal for 50 seconds as in (c); the remaining portion of the message is then sent as stated.

B.—HIGH POWER W/T D.F. STATIONS.

The procedure to follow for obtaining bearings is analogous to that indicated for low power stations.

The wavelengths for watchkeeping and for the bearing are the same, *viz.*, 2,100 metres (continuous wave).

If the D.F. station is connected to a W/T station keeping permanent watch on 2,400 metres (C.W.), a ship can ask for the bearing on 2,100 metres (C.W.) by applying to the D.F. station on 2,400 metres (C.W.), (*e.g.*, Trinité W/T D.F. is connected to Brest—Mengan W/T).

In this case the wavelength of 2,400 metres (C.W.) is used for calling only; and the wavelength of 2,100 metres (C.W.) is used for all the signals that follow.

CHARGE.—A charge of six francs is made for each bearing.

CAUTION.—When the bearing between the ship and the D.F. station is parallel, or nearly so, with the general trend of the coast, its accuracy cannot be relied on. The error under such conditions may be as large as 10°. It is necessary, therefore, to warn ships against the use of D.F. bearings, when the angle between the line of bearing and the coast is less than 20°. If, however, circumstances necessitate the acceptance of a bearing under these conditions, the amount of possible error must always be taken into account.

NOTE.—The French Government decline all responsibility so far as the accuracy of the bearings transmitted is concerned.

GERMANY

Radio compass stations belong to the State Marine, but are also available for public use.

For the radio direction finding service there are, on the German coasts, the radio direction finding stations of Borkum F.R.A., Nordholz F.R.A., List F.R.A., Stolpmünde F.R.A., and Warnemünde F.R.A., which are supported by the directional indications of the wireless stations of Borkum F.S., Nordholz F.S., List F.S., Stolpmünde F.S., Warnemünde F.S. and Wilhelmshaven III, Einfahrt F.S. The directional indications are given free of charge. Further installations of this kind will, it is anticipated, be erected at Cuxhaven and Norddeich. The radio directional stations of Stolpmünde F.R.A. and Warnemünde F.R.A., are used for naval service traffic only. Further particulars as to the geographical position, etc., are to be found in the Nomenclature Officielle des stations radio-télégraphiques, etc.

A ship requiring bearings should call Wilhelms-haven Radio Compass Station (KAN) according to International Regulations, on wave of 600 metres. That station makes the necessary arrangements with the radio compass stations, and communicates the position ascertained in latitude and longitude to the vessel concerned.

The signals employed are:

QTE—What is my true wireless bearing?
Your true bearing is degrees.

QTF—What is my ship's position by wireless bearing?

Ship's position is

KAN thereupon signals the ship concerned to wait, and, on another wave, requests the D.F. stations to give the bearings. As soon as the latter are ready, KAN requests the ship to send VVVs. This the ship does for one minute (first of all transposing the transmitter to the 800 metres wave), frequently interspersing the signal with her own call signal.

When Send VVVs is signalled for the first time, and the bearing fails to reach the D.F. station, the latter replies "No bearing." In this case the vessel is ordered to repeat. This signal need not last longer than a minute. After VVVs have been sent, the transmitter should be altered back to 600 metres.

Bearings are reckoned true from the D.F. station concerned. Errors in the individual bearings may amount to 2°. From bad tuning, indifferent transmission and other causes, errors may sometimes be increased. Bearings running nearly in the direction of the coast line are subject to greater variation, as are also those passing alternately over water and land. When intermittent fog occurs, fog banks lying in the line of bearing can occasion divergence, and thereby give rise to corresponding errors in the bearings.

Large ships are recommended generally to use example (a), as in fixing the ship's position on board, any errors in the individual bearings are more easily recognised and can be adjusted.

Example (b) is intended mainly for smaller vessels on which in heavy seas accurate plotting on the chart is attended with difficulty.

As a third case it may happen that a vessel only obtains a single bearing from one D.F. station; in this case she calls up the nearest station (see under example (c)).

For ships which are unable to alter the transmitter to the 800 metres wave, it is possible for bearings to be given on 600 metres. In this case the signal "QSY 600" should be added to the signal "QTE?" or "QTF?" when asking for bearings; for method see under example (d). It should be observed, however, that, judging from experience, the 600 metres wave does not give such good results as the 800 metres.

EXAMPLES.

Wilhelmshaven contro: station call signal—KAN

S.S. "Kleist" call signal—DST

Borkum W/T—KBM

Nordholz W/T—KBN

List W/T—KAL

Borkum W/T D.F.—KBO

Nordholz W/T D.F.—KBQ

List W/T D.F.—KAO

(a) S.S. "Kleist" requires bearings from each of the three D.F. stations (on 800 metres wave).

1015 (600 m.) —•—•—•— KAN KAN

KAN DE DST —•—•—•—

1016 (600 m.) —•—•—•— DST DST DST

DE KAN —•—•—•— K

1016 (600 m.) —•—•—•— KAN DE DST

—•—•—•— QTE —•—•—•—

1017 (600 m.) —•—•—•— DST DE KAN

VE EB

1017 Call to the D.F. stations on another wave: "Bearing β DST λ 600 m."

1018 (600 m.) —•—•—•— DST DE KAN

—•—•—•— Please send VVVs 800 m.

—•—•—•—

1018 (800 m.) —•—•—•— KAN DE DST

—•—•—•— VVVs, etc. DST —•—•—•—

(The call signal of the ship must be frequently interspersed in the VVs sent).

(1020-1022. The stations transmit the results on a different wave to KAN.)

1023 (600 m.) —•—•—•— DST DE KAN

—•—•—•— QTE 1018 β KBO α β KBQ γ ,

β KAO α VE UD —•—•—•— K

1024 (600 m.) —•—•—•— KAN DE DST

VE VE —•—•—•— SK

1024 (600 m.) —•—•—•— DST DE KAN

VE VE SK

(1025 Advice from the stations on completion of the bearing.)

NOTE.—Communication between KAN and the D.F. stations is carried on a different wave, so as not to interfere with the messages on 600 metres.

(b) S.S. "Kleist" requires her position by wireless bearing (on 800 metres wave).

The method employed is similar to (a), except that the ship asks for "QTF?" not "QTE?," and obtains her position by latitude and longitude.

(c) The ship (DST) requires only a single bearing from a D.F. station (on 800 metres wave). She calls the W/T station belonging to the W/T D.F. station concerned, with which she exchanges signals. The bearing in this case also is reckoned from the D.F. station

1030 (600 m.) —••••• KBM KBM
 KBM DE DST —•••••
 1031 (600 m.) —••••• DST DST DST
 DE KBM —••••• K
 1031 (600 m.) —••••• KBM DE DST
 —••••• QTE —•••••
 1032 (600 m.) —••••• DST DE KBM
 —••••• Please send VVs 800 m.
 —•••••
 1032 (800 m.) —••••• KBM DE DST
 —••••• VVs, etc. DST —•••••
 (The call signal of the ship must be frequently interspersed with the Vs sent.)
 1034 (600 m.) —••••• DST DE KBM
 —••••• QTE 1032 x° —••••• K
 1035 (600 m.) —••••• KBM DE DST
 VE VE —••••• SK
 1035 (600 m.) —••••• DST DE KBM
 VE SK
 (d) The ship (DST) requires only a single bearing from a D.F. station, but cannot employ the 800 metres wave.
 1030 (600 m.) —••••• KBM KBM
 KBM DE DST —•••••
 1031 (600 m.) —••••• DST DST DST
 DE KBM —••••• K

1031 (600 m.) —••••• KBM DE DST
 —••••• QTE —••••• QSY 600
 —•••••
 1032 (600 m.) —••••• DST DE KBM
 —••••• Please send VVs 600 m.
 —•••••
 1032 (600 m.) —••••• KBM DE DST
 —••••• VVV etc. DST —•••••
 (The call signal of the ship must be frequently interspersed with the Vs.)
 1034 (600 m.) —••••• DST DE KBM
 —••••• QTE 1032 x° —••••• K
 1035 (600 m.) —••••• KBM DE DST
 VE VE —••••• SK
 1035 (600 m.) —••••• DST DE KBM
 VE SK

REMARKS.—Should bearings or the ship's position be required through the three D.F. stations on the 600 metres wave according to examples (a) and (b), the procedure should be as above. In these cases the Control stations signals the D.F. stations as follows:—

Bearing B DST λ 600 m.

NOTE.—Mid-European time is used, the hours and minutes being expressed in four figures from 0000 to 2359.

GREAT BRITAIN*

Acts and laws affecting direction finding are to be found under Great Britain in the Laws and Regulations Section.

All D.F. stations keep watch and take bearings on the 450 metres wave; the use of any other wave is strongly to be deprecated. They work as independent stations and can transmit, as well as receive, on 450 metres.

Ships with Marconi apparatus can adjust their transmitting gear very nearly to this wave (using reduced power) by cutting out half the primary transmitting condenser and adjusting the A.T.I. till the earth lamp shows maximum current in the aerial. The primary slider should be "all in."

The actual procedure to be adopted by ships requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave, bearings should be asked for separately. If on the other hand the stations to be called all keep watch on the same wave, they should be called up together and the bearings taken in one operation. If, however, two or more stations are linked by special land lines, only one of them should be called up. In such cases, however, the ship must specify in the preliminary signal the D.F. stations which are required to supply bearings.

The following signals are to be used:—

Signal.	Meaning.
QTE ?	"What is my true bearing from you (or from)?"
QTE	"Your true bearing from me (or from) was degrees."

(a) The ship calls the station or stations on the appropriate wave, making "QTE ?" in conjunction, if necessary, with the call signals of the stations from which bearings are required and also (if the call is *not* made on 450 metres) by the figures "450," signifying that the ship will shift to 450 metres for the taking of the bearing. The ship then awaits instructions.

EXAMPLE 1.

A ship whose call is XYZ requires bearings from BXV and BZW.

The ship, having first shifted to 450 metres, calls BXV thus:—

CT BXV BXV de XYZ QTE BXV BZW ?
 She then awaits instructions.

EXAMPLE 2.

The ship (XYZ) requires a bearing from BXK. The ship has to use 600 metres to call GMH. She calls on 600 metres, thus:—

CT GMH GMH de XYZ QTE BXK ? 450.

She then gets ready to shift to 450 metres and awaits instructions.

(b) The station or stations called then make the necessary arrangements and, when ready, answer in alphabetical order of their call signals (if more than one was originally called) and make "K" (go on) preceded by "450" if 450 has been made in the original call.

EXAMPLE 3.

BXV, in Example 1 above, warns BZW by land line and, when both are ready, makes on 450 metres:—

CT XYZ de BXV K.

EXAMPLE 4.

GMH, in Example 2 above, warns BXK by land line and then makes on 600 metres:—

CT XYZ de GMH 450 K.

GMH then shifts to 450 metres so as to be ready to give the result when received by wire from BXK.

(c) On receiving "K," the ship, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 60 seconds and awaits the result.

EXAMPLE 5.

The ship (XYZ) in Example 1 above, makes on 450 metres:—

CT BXV de XYZ XYZ XYZ etc. (for 60 seconds) XYZ.

EXAMPLE 6.

The same as Example 1, reading GMH for BXV.

(d) The station or stations then reply (in alphabetical order if more than one) either asking the ship to repeat (?) or giving the result. The result is given by the signal QTE followed as necessary by the call signal

* At present including Ireland.

and by a group of *three* figures (000 to 359) indicating the true bearing from 000° to 359° of the ship *from* the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time (civil) for all messages giving bearings to merchant ships.

EXAMPLE 7.

BZW, in Example 1 above, is not satisfied with the bearing and informs BXV. BXV makes on 450 metres:—

CT XYZ de BXV?

The ship at once complies by making on 450 metres:—

CT BXV de XYZ XYZ XYZ, etc. (for 60 seconds) XYZ.

BZW is then satisfied that the bearing is 340° and informs BXV, while BXV finds that its own result is 37°. BXV therefore makes on 450 metres:—

CT XYZ XYZ de BXV 1 9.45 M (time)
=QTE BZW 340 BXV 037 + BXV.

EXAMPLE 8.

BXK, in Example 2, above, gets a satisfactory bearing of 329° and informs GMH. The latter makes on 450 metres:—

CT XYZ XYZ de GMH 2 10.46 S (time)
=QTE BXK 329 + GMH.

EXAMPLE 9.

Had the ship (XYZ) merely asked BVY for a bearing. BVY, finding it to be 246°, would make on 450 metres:—

CT XYZ XYZ de BVY 1 7.6 M (time)
=QTE 246 + BVY.

(e) In order to confirm to the D.F. station that the message has been received correctly, the ship on receiving the result will repeat back the message. The station will then acknowledge or repeat if necessary, and when satisfied that the ship has received the message correctly will make the "end of work" sign. This sign is then repeated by the station or stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

The stations are operated by the Royal Navy, but are available for the use of the Mercantile Marine.

A charge of five shillings (5s.) will be made for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

The accuracy with which bearings can be taken depends on certain conditions already referred to, but although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given, from any failure in the service, or from any other cause whatever.

(Notice No. 952 of 1920.)

AIR MINISTRY NOTICE TO AIRMEN,

No. 103, DATED SEPTEMBER 30TH, 1920.

ROYAL NAVY WIRELESS DIRECTION FINDING STATIONS.

It is hereby notified:—

1. Aircraft may use the Wireless Direction Finding Stations operated by the Royal Navy, under the conditions laid down for the use of these stations by the Mercantile Marine, in Admiralty "Notice to Mariners," No. 524, of March 25th, 1920.

Note.—(a) Rhyl is not fitted with transmitting apparatus, and is controlled by Amlwch.

(b) Seaview has no transmitting apparatus, and is controlled by Malin Head (GMH), which keeps watch on 600 metres.

2. The actual procedure to be adopted by aircraft requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (e.g., Lizard and Carnsore), they should be called up together, and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (e.g., Amlwch and Rhyl) only one of them should be called up. In such cases, however, the aircraft must specify in the preliminary signal the D.F. stations which are required to supply bearings.

3. The following abbreviations are to be used:—

Signal.	Meaning.
QTE? ..	"What is my true bearing from you (or from —)?"
QTE ..	"Your true bearing from me (or from —) was — degree."

4. The aircraft calls the station or stations, on the appropriate wave, making "QTE?" in conjunction, if necessary, with the call signals of the stations from which bearings are required; and also (if the call is NOT made on 450 metres) by the figures "450," signifying that the aircraft will shift to 450 metres for the taking of the bearing. The aircraft then awaits instructions.

Example 1.

An aircraft whose call signal is XYZ requires bearings from Amlwch (BXV) and Rhyl (BZW).

The aircraft, having first shifted to 450 metres, calls Amlwch thus:—

CT BXV BXV de XYZ QTE BXV BZW?
The aircraft then awaits instructions.

Example 2.

The aircraft requires a bearing from Seaview (BXK). The aircraft has to use 600 metres to call Malin Head (GMH).

The aircraft calls on 600 metres, thus:—
CT GMH GMH de XYZ QTE BXK? 450
The aircraft then gets ready to shift to 450 metres and awaits instructions.

5. The station or stations called then make the necessary arrangements, and, when ready, answer in alphabetical order of their call signals (if more than one was originally called), and make "K" (go on) preceded by "450" if 450 had been made in the original call.

Example 1.

Amlwch, in Example 1 above, warns Rhyl by land line, and, when both are ready, makes on 450 metres:—

CT XYZ de BXV K.

Example 2.

Malin Head, in Example 2 above, warns Seaview by land line and then makes on 600 metres:—

CT XYZ de GMH 450 K.

Malin Head then shifts to 450 metres, so as to be ready to give the result when received by wire from Seaview.

6. On receiving "K," the aircraft, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 45 seconds, and awaits the result.

Example 1.

The aircraft, in Example 1, para. 4, makes on 450 metres:—

CT BXV de XYZ XYZ CYZ, etc. (for 45 seconds) XYZ.

Example 2.

The same as Example 1, reading GMH for BXV.

7. The station or stations then reply (in alphabetical order if more than one) either asking the aircraft to repeat (?) or giving the result. The result is given by the signal QTE, followed, as necessary, by the call signal and by a group of three figures (000 to 359) indicating the true bearing from 0° to 359° of the aircraft from the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time for all messages giving bearings to aircraft.

Example 1.

Rhyl, in Example 1 above, is not satisfied with the bearing and informs Amlwch. Amlwch makes on 450 metres:—

CT XYZ de BXV ?

The aircraft at once complies by making on 450 metres:—

CT XYZ de XYZ XYZ XYZ, etc. (for 45 seconds) XYZ.

Rhyl is then satisfied that the bearing is 340° and informs Amlwch, while Amlwch finds that its own result is 37°. Amlwch therefore makes on 450 metres:—

CT XYZ XYZ de BXV 1 9.45 M (time)
=QTE BZW 340 BXV 037+BXV.

Example 2.

Seaview, in Example 2 above, gets a satisfactory bearing of 329° and informs Malin Head. The latter makes on 450 metres:—

CT XYZ XYZ de GMH 2 10.46 S (time)
=QTW BKK 329+GMH.

Example 3.

Had the aircraft merely asked Lizard (BVY for a bearing, Lizard, finding it to be 246° would make on 450 metres:—

CT XYZ XYZ de BVY 1 7.6 M (time)
=QTE 246+BVY.

8. The aircraft, on receiving the result, acknowledges receipt in the ordinary way, and makes the "end of work" sign. This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

9. Further information on this subject is contained in Admiralty "Notices to Mariners," Nos. 363 of February 25th, 1920; 524 of March 25th, 1920; and 838 of May 22nd, 1920, which should be consulted.

By Command of the Air Council,

W. F. NICHOLSON.

Air Ministry, London, W.C. 2,

September 30th, 1920.

ITALY

Vessels wishing to obtain bearings from a D.F. station must call up the control station, and the latter, having obtained the required information, will duly transmit it to them. The bearings are true, and are given in degrees from 000° to 359°.

The procedure is as follows:—

A ship whose call signal is ABC wishes a bearing.

On a wave of 600 metres she will signal:—

CT ICZ ICZ de ABC QTE ?

The D.F. control station will answer:—

CT ABC de ICZ AS.

The control station then wires the D.F. station and when ready replies:—

CT ABC de ICZ K 6.

ABC after 30 seconds signals:—

CT ICZ de ABC ABC ABC, etc., for 45 seconds.

If dissatisfied with the bearing, the D.F. station, through the control station, will ask the ship to repeat.

Control station signals:—

CT ABC de ICZ UD.

ABC repeats the signal as given above.

When satisfied with the bearing (which in the case of Murano is assumed to be 170°, at 9.45), the D.F. station will wire it to the control station, whence it is passed to the ship as follows:—

CT ABC de ICZ de IRM 9.45 M BT QTE
170 AR ICZ.

ABC acknowledges receipt:—

CT ICZ de ABC R SK.

A charge of six francs is made for each bearing transmitted by an Italian W/T D.F. station. The charges are collected in the same manner as for wireless telegrams originating from ships.

NEWFOUNDLAND AND LABRADOR

(See under CANADA)

NORWAY

FIVE Norwegian coast stations are equipped with direction finding apparatus of the Marconi type. One of them will, in the near future, be opened for official use. The wavelength to be employed is 600 metres.

Two radio-beacons are in course of construction, one at Marstenen (the entrance of the port of Bergen), and one at Faerder (the entrance of the Kristiania Fjord). The wavelength to be used is 1,000 metres.

SWEDEN

A vessel which requires a bearing should call up the control station, on a wavelength of 600 metres, and send the signal:—

"QTE? = What is my true bearing from ?"

The vessel should then await instructions while the requisite information is being obtained by the control station, which will signal the result of the observations by sending:—

"QTE = Your true bearing from SAL was degrees."

The bearing is given by a group of three figures from 000 to 359, corresponding to 000° (North) to 359°

Immediately the information has been received the vessel should acknowledge the receipt in the usual manner, concluding with the "end of work" sign, which will be repeated by the control station.

Until further Notice the bearings will be transmitted free of charge.

Although every care will be taken to ensure the accuracy of the bearings transmitted, the Swedish authorities accept no responsibility whatever for damage incurred, either directly or indirectly, through any inaccuracy, or from any other cause.

In order that the operations of the D.F. station may be checked, mariners are requested to forward to Kungl. Telegrafstyrelsens Radiobyra, Stockholm 2, a brief report, giving the results of observations thus obtained.

- (a) Vessel's name.
- (b) Radio compass station's name.
- (c) Date and time (G.M.T.) when vessel received bearing.
- (d) Bearing given by radio compass station.
- (e) Vessel's position when bearing was received, determined in some other manner.
- (f) The probable accuracy of the calculated position.
- (g) Weather conditions at the time.
- (h) Eventual remarks.
- (i) Captain's or observer's signature.

UNITED STATES OF AMERICA

Acts and laws affecting direction finding are to be found under U.S.A. in the Laws and Regulations Section.

THE most recent and probably the most valuable aids to navigation in a fog are the radio compass stations.

While the use of these radio bearings should not lead a mariner to neglect other precautions, such as the use of the lead, etc., during a fog, these bearings will greatly reduce the dangers to navigation for mariners who are compelled for any reason to proceed during foggy or misty weather.

These radio compass stations are provided primarily to assist the mariner in closing the land during fog or poor visibility, but they may also be used to obtain the positions of vessels at sea in radio compass range, about 150 miles, when for any reason positions cannot be obtained by other means.

The maximum distance for which bearings from these stations are accurate is 150 miles. But accurate positions cannot be plotted when more than 50 miles from the shore on Mercator charts, for the Mercator projection introduces a distortion of the true bearing. Charts based on the Gnomonic projection are essential to plot correctly long-distance radio bearings.

Such charts are now under construction by the Hydrographic Office; until they are available mariners may use the Mercator chart for long distance bearings, applying necessary corrections which may be obtained by various methods, one of which is fully explained on the backs of H. O. Pilot Charts of the North Atlantic Ocean for February, 1921; North Pacific Ocean for May, 1921; Indian Ocean for June, 1921; and Central American Waters, for March, 1921.

Radio Compass Stations are divided into two classes:

(a) Single stations, operating independently and furnishing a single bearing. These stations are located with the view of giving service to ships at a distance of not over 150 miles from the station.

(b) Harbour entrance groups. All stations in harbour entrance groups are connected to and controlled by the master station; all stations of the group take bearings simultaneously and these bearings are transmitted to the ship requesting them by the control station. The purpose of these stations is to lead mariners to the light vessels off harbour entrances.

Where only one radio compass station is available, the mariner may fix his position by two or more bearings from the station with the distance run between, or may use the bearing as a line of position, or as a danger bearing. Or the bearing may be crossed with a line of position obtained from an observation of an astronomical body to establish a fix.

The following instructions have been issued by the United States Naval Communication Service concerning the W/T D.F. stations maintained by them:—

The U.S. Naval Communication Service will furnish bearings to all vessels equipped with W/T transmitters.

Wavelengths.—All independent and group D.F. stations keep watch on 800 metres. Only this wave should be used to call and work with the stations.

Calling a W/T D.F. station.—To obtain a bearing from independent stations, call the station from which the bearing is desired in the usual manner and request bearings by means of the conventional signal given below. Simultaneous bearings from two or more stations can be obtained by making the call include the other stations desired.

To obtain bearings from the harbour entrance stations carry out the procedure previously given. The Control Station only will answer.

Conventional signals.—The following signals will be used:—

Signal.	Meaning.
QTE ?	What is my true bearing?
QTE	Your true bearing is _____ degrees from D.F. station.

DETAILS.

(a) A ship calling the D.F. station or D.F. Control Station should make the abbreviation "QTE ?" This request will be answered by the station or Control Station, and when ready to observe the bearing it will send the signal "K," indicating to the ship to repeat its distinguishing signal for a period of 50 seconds. The signal should be made slowly with the dashes considerably prolonged.

(b) The testing should be made on 800 metres, upon the completion of which the ship should await reply from the D.F. station.

(c) The station or Control Station will then reply, repeating the signal "QTE," followed by the bearing in degrees given by a group of three figures 000 to 359, indicating the true bearing in degrees of the ship station from the D.F. station, and then the time group giving the time of observations in local Standard Time. In the case of more than one D.F. station connected by land line only, the station originally called will answer. This station will combine all the bearings taken by itself and associated station into one message, which gives each bearing observed immediately after the name of the station making the observation.

All D.F. stations transmit on 800 metres.

EXAMPLE.

A ship (call letters KVA) desires to get bearings from the Delaware Bay entrance group (call letters NSD). The following procedure is used:—

```

- - - - - NSD NSD NSD - - - - - KVA
KVA KVA - - - - - QTE - - - - - AR
- - - - - KVA - - - - - NSD K.
- - - - - NSD - - - - - KVA
- - - - - QTE - - - - - KVA KVA
KVA (making call letters for KVA for 50 seconds
prolonging the dashes) - - - - - KVA AR
- - - - - KVA - - - - - NSD
- - - - - QTE
Cape May 120 Cape Henlopen 110 Bethany
Beach 085 at 0126 - - - - - NSD AR
- - - - - NSD - - - - - KVA
- - - - - 120 110 085 at 0126 - - - - -
AR
- - - - - KVA - - - - - NSD R
- - - - - NSD

```

This method is the only authorised procedure for obtaining the bearings and should be followed exactly. Such signals as MO = V = and other test signals are not authorised for D.F. work. The testing period of 50 seconds should not be exceeded.

Mariners who do not follow the prescribed procedure exactly occasion delay to themselves in obtaining bearings, and to others who may be waiting for an opportunity to use the stations.

Danger from reciprocal bearings.—Attention is invited to the fact that when a single bearing is furnished there is a possibility of an error of approximately 180°, as the D.F. station cannot always determine on which side of the station the vessel lies. Certain stations, particularly those on islands or extended capes, are equipped to furnish two corrected true bearings for any observation. Such bearings when furnished vessels may differ by approximately 180°, and whichever bearing is suitable should be used.

Caution.—Mariners receiving bearings which are evidently the approximate reciprocal of the correct bearing should never attempt to correct these bearings by applying a correction of 180° as such correction would not include the correction necessary on account of deviation at the D.F. station.

An error of as large as 030° may be introduced by applying an arbitrary correction of 180° to such bearings. Vessels receiving bearings manifestly requiring an approximate 180° correction should request the other bearing from the D.F. station if not previously furnished.

Bearings, except in the case of approximate reciprocal bearings, should be accurate within 002° of arc provided the ship's W/T transmitting equipment is tuned sharply to 800 metres. Operators should use sufficiently wide coupling to obtain low decrement. If transmitters are not tuned sharply it is difficult to obtain bearings that are sufficiently accurate for navigational purposes.

When bearings from three or more D.F. stations are not over 002° of arc in error, but do not meet at a fixed point, the geometrical centre of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

Mariners until thoroughly familiar with the system are advised to use the D.F. stations frequently, especially in clear weather when positions of vessels can be accurately fixed, in order to accustom operators to the procedure and to acquaint themselves with the degree of accuracy and dependability of bearings furnished by the stations.

Reports.—In order that the operation of the D.F. stations may be checked, mariners obtaining bearings are requested to forward a brief report to the Director, Naval Communications, Navy Department, Washington, D.C., U.S.A., containing the following particulars:—

1. Name of ship.
2. Name of D.F. station.
3. Date and local Standard time at which D.F. bearing was taken.
4. Bearing given by D.F. station.
5. Estimated position of ship at above time and dates by methods other than W/T.
6. The probable degree of accuracy of the estimated position.
7. Weather conditions at above time.
8. Remarks, if any.
9. Signature of master or responsible navigating officer.

There is no change for bearings furnished by the U.S. Naval W/T D.F. Stations.

INFORMATION WITH REGARD TO BEARINGS

The Director, U.S. Naval Communication, states that considerable difficulty is being experienced with merchant ships asking for D.F. bearings on very broad tunes, and that "bearings obtained by wireless should be accurate within 2 degrees, provided that the transmitting equipment on board vessels is tuned sharply to 800 metres. Wireless operators are cautioned to use sufficiently wide coupling to obtain low decrement. If transmitters are not tuned sharply it is difficult to obtain bearings that are sufficiently accurate for navigational purposes."

Masters of vessels are advised to use the D.F. stations frequently, particularly in clear weather and when the vessel's position is definitely fixed in order that the degree of accuracy and dependability of the wireless compass may be established.

Masters of vessels are invited to make use of the U.S. naval radio compass (direction finding) stations to fix positions. They will be found especially useful during thick weather.

The following U.S. naval shore radio compass stations are now in operation for the purpose of furnishing bearings in the Western Atlantic and the Gulf of Mexico. For the present there will be no charge for bearings furnished.

RADIO COMPASS STATIONS ON ATLANTIC AND PACIFIC COASTS ALPHABETICALLY BY NAMES OF STATIONS.

ATLANTIC COAST.

Name of Station.	Call Signal.	Name of Station.	Call Signal.
Amagansett, N.Y.	NBM	Hog Island, Va.	NCZ
Anacostia, D.C.	NSF	Jupiter, Fla.	NAQ
Bar Harbour, Me. (Otter Cliffs, Me.)	NBD	Key West, Fla.	NAR
Bethany Beach, Del.	NSD	Mantoloking, N.J.	NAH
Cape Elizabeth, Me. (Portland)	NAB	North Island, S.C.	NZW
Cape Hatteras, N.C.	NDW	North Truro, Mass.	NAE
Cape Henlopen, Del.	NSD	Pensacola, Fla.	NAS
Cape Lookout, N.C.	NAN	Poyners's Hill, N.C.	NCZ
Cape May, N.J.	NSD	Price's Neck, R.I.	NAF
Chatham, Mass.	NXA	Takehunt, N. J.	NLL
Deer Island, Mass.	NAD	Sandy Hook, N. J.	NAH
Fire Island, N.Y.	NAH	Surfside, Mass. (Nantucket)	NBS
Folly Island, S.C.	NZV	Tyhee, Is. Ga.	NEV
Fourth Cliff, Mass.	NAD	Virginia Beach, Va.	NCZ
Gloucester, Mass.	NAD		

U.S. PACIFIC COAST.

The following stations on the Pacific Coast are completed and in commission to give continuous service to shipping :—

PACIFIC COAST.

Name of Station.	Call Signal.	Name of Station.	Call Signal.
Bird Island, Calif.	NLD	Point Arguello, Calif.	NPK
Cape Hichenbrook, Alaska	NRM	Point Fermin, Calif.	NPX
Cattle Point, Wash.	NFN	Point Hueneme, Calif.	NMD
Empire Oreg.	NPF	Point Loma, Calif.	NPL
Eureka, Calif.	NPW	Point Montara, Calif.	NLH
Farallons Island, Calif.	NPI	Point Reyes, Calif.	NLG
Fort Stevens, Oreg.	NPE	Port Angeles, Wash.	NFT
Imperial Beach, Calif.	NPL	Smith Island, Wash.	NFH
New Dungeness, Wash.	NFT	Soapstone Point, Alaska	NUW
Ocean Park, Wash.	NPE	Tatoosh, Wash.	NPD

Masters of ships are informed that in making use of the San Francisco Harbour entrance group they are requested to call the Farallon Island Station, who will obtain bearings from the remaining stations in the group and furnish them to the ship, after corrections have been applied.

ACCURACY OF RADIO BEARINGS.

The following information was furnished by the Director of the U.S. Naval Communication Service under date of October 10th, 1919 :—

"The reliance that can be placed in bearings

furnished by shore radio compass stations will be governed by the following conditions :—

"(a) When two sets of bearings are received which do not agree, a third set should immediately be requested.

"(b) In thick weather, bearings should be requested at least every half-hour.

"(c) Bearings that pass over intervening land or that are tangent to the shore line are not as reliable as those that have a clear sweep over the sea.

"(d) Navigators receiving a set of bearings should immediately investigate the approximate fix indicated and determine whether or not they are being furnished with bearings from the stations that should be most reliable.

"(e) When the position of the ship as indicated by the radio bearing differs materially from the position of dead reckoning, a second set of radio bearings should be requested in order to check the first radio position."

NOTE.—While the Navy Department states that at the present time radio compass bearings have reached a high degree of accuracy, it must be understood that the Government incurs no liability for any consequences resulting from any inaccuracy in the taking or transmission of radio compass bearings. These bearings are provided free of charge, as aids to navigation, to be used at the discretion of the master of the vessel.

Radio Compass Stations—Calibrated Arcs of.

Bearings are only reliable in the arcs of the circle for which stations have been calibrated.

Stations.	Arc of Calibration.
Empire*	230-360 (true).
Fort Stevens†	185-295 (true).
Ocean Park‡	205-345 (true).
Tatoosh	230-90 (true), clockwise
New Dungeness†	255-95 (true), clockwise
Smith Island‡	0-360 (true), complete circle.
Cattle Point‡	130-275 (true), clockwise
Soapstone Point‡	253-50 (true), clockwise
Cape Hinchinbrook‡	112-294 (true), clockwise

* Not in commission.

† In commission for continuous service.

‡ Limited commission available for bearings during foggy weather.

Note.—All of the above sectors must be understood as being of the circle of which the compass coil is at the centre, and are observed from the listed position of the compass stations.

SPECIAL ARTICLES

- (A) "Recent Progress in High Speed Wireless Telegraphy."
- (B) "Aerials."
- (C) "Valve Design and Manufacture."
- (D) "Multiple Aerial Arrangements."

RECENT PROGRESS IN HIGH SPEED WIRELESS TELEGRAPHY.

By G. M. WRIGHT.

IN looking over the work which has been done recently in the development of the art of reception in Wireless Telegraphy, one is most impressed by the notable absence of proposals for circuits, etc., having for their object the complete elimination of atmospherics. The decade prior to the War produced a multitudinous array of "X stoppers"—a good number of which appeared to rest on solid facts—but our increasing knowledge of the subject has gradually enabled us to understand the fundamental fallacies involved. An interesting case is that of "balancing out" atmospherics. In this arrangement two circuits are arranged in such a manner that whereas one is receiving both signals and X's, the other is receiving X's alone. If then the second circuit is arranged so that its effect on the ultimate receiver (recorder or telephone) subtracts from the effect due to first, it would appear that the X's should vanish leaving the signal undisturbed. It has, however, been shown that no such balance can exist even in the most plausible case when the power from one circuit is balanced against the power from the second. The destruction of the "balance" theory has done much to cripple the resources of the devisers of X stopping circuits, who seemed to have turned their attentions to the problem of patenting all the available combinations of capacity inductance and resistance with the three electrodes of a valve.

Under these circumstances progress has mainly consisted in:—

- (1) The development of directional receiving aerials.
- (2) The scientific application of tuning (band filters, etc.).
- (3) The attainment of a continuous wave transmitter which will radiate a wave of constant frequency.
- (4) The evolution of circuits which will possess certain desired characteristics and at the same time be practicable.

The most potent weapon we have to use against X's is that provided by directional receiving systems. Take the case of the reception of signals from New York in England. The direction from which the signals are arriving lies a little North of West (the bearing of the high-power station on Long Island is N. 288 E. at London). On the other hand the predominating direction of atmospherics in England is between South and South-East. Consequently any aerial system which possesses the property of unidirectional reception will at once give a marked improvement in the readability of the American signals, for we can direct the "blind eye" of the system to the atmospherics and at the same time retain New York in a sector having good receiving properties. This is a most valuable asset and it is very fortunate for Transatlantic working that Nature has arranged the X direction in this manner. Even if atmospherics are arriving more or less uniformly from all directions a unidirectional receiver will give an advantage, since X's arriving from the sector of low receiving power do not disturb the circuits or are weakened, and consequently the total number of X's received is reduced.

Directional reception has received considerable attention in England, and C. S. Franklin has worked out a system of spaced frame aerials with very definite directional properties. In this system the directional effect is obtained by making use of the fact that the E.M.F.'s induced in two aerials spaced a fraction of a wavelength apart and geographically lying in the direction of the transmitting station differ in phase. This phase difference is simply due to the fact that the arriving wave strikes the aerial nearest to the transmitter prior to its arrival at the most distant aerial, and consequently the

E.M.F. in the nearest aerial has a leading phase relative to that in the other aerial. By combining the currents due to these E.M.F.'s in a common circuit, in conjunction with additional controllable phase shifts introduced by the circuits themselves, a variety of polar curves of reception can be produced. Fig. 1. is an example of a characteristic diagram obtained in this manner. It will be observed that there are three completely blind spots, at 90° , 180° and 270° from the maximum direction of reception, and that in the 90 - 180° and 180 - 270° sectors the receiving power is relatively small. In fact we may say that from 80 - 280° the receiving power is low generally and in three directions in this sector it is zero. It will be readily understood that such a polar curve of reception will give a very marked reduction in the X intensity when receiving American signals in England on account of the large difference in azimuth between the arriving signals and the prevailing atmospherics. The advantage to be gained from a carefully adjusted polar curve is most remarkable. Signals may be so badly mutilated by X's when received on a plain open aerial, as to be unreadable, when the substitution of a system with a correct polar curve at once makes the ratio of signal to X intensities sufficiently favourable for fast working. A very large number of polar curves of reception for various combinations of multiple spaced aerals (both frame and open aerals) have been worked out theoretically.

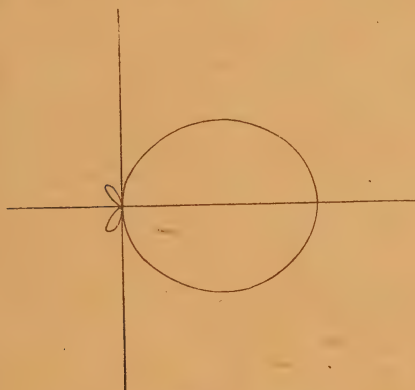


Fig. 1.

The subject is nevertheless by no means exhausted and it is known that the angle of reception may be made as narrow as we please by extending the territory covered by the aerial systems. This area covered is very large for sharp diagrams and the difficulty of combining the currents becomes so great as to render the scheme almost impracticable. It seems therefore that future development will lie in the direction of improvement in the methods of combinations of aerals, together with the determination of the most economical way of placing the aerals for the best polar curve.

In America work is also being carried out on directional reception, and H.H. Beverage has devised a type of aerial which makes use of transmission phenomena in a novel manner. The aerial consists of a low horizontal wire lying in the direction of the arriving waves and earthed at the end nearest to the transmitting station through a resistance. This resistance is of such a value that no reflection of an electric wave along the wire can occur from the earthed end. The aerial is very long, being generally about equal in length to the wavelength of the received signal. Owing to the resistance of the earth or sea over which electromagnetic waves must travel the wave

front is tilted forwards. This tilt gives a small horizontal component to the electric force in the wave lying in the direction of propagation. If then such an electromagnetic wave is incident on one end of a long wire lying in the direction of propagation, the horizontal component of the electric force in the wave will induce an E.M.F. (and consequently a current) in the end portion of the wire. The disturbance will immediately be propagated along the wire with a velocity nearly equal to that of light, and therefore as the wave in the ether moves along it will be accompanied by the current wave set up when it first encountered the end of the wire. Now the rate of flow of energy from the field of the wave to the wire is equal to the product of the applied E.M.F. and the current at the place under consideration. Under these circumstances it can be seen that the current will steadily increase as the wave proceeds along the wire, since both the wave in the conductor and the wave in the ether have nearly the same velocity. If, however, the ether wave is incident at an angle relative to the direction of the wire, then the phase angle between the current in the aerial and the applied E.M.F. will change as the disturbance moves and the additive effect will not be so marked. This change in phase, which varies very rapidly with the angle of incidence, results in a pronounced directional diagram.

It was stated that one end of the wire is earthed through a terminal resistance of such a value that no reflection of the wave can occur. In Fig. 2 consider a wave incident in the direction B to A. A small E.M.F. is set up by the horizontal electric field in the ether wave at B, the resulting disturbance passes along the wire together with the ether wave and continues to grow in intensity until its arrival at A. Owing to the presence of the terminal

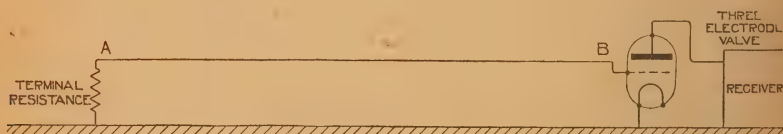


Fig. 2.

resistance no reflection can occur and consequently the energy in the conductor wave is dissipated as heat in the resistance. The end B is shown connected to the grid of a three electrode valve, and therefore the plate current of this valve will be a function of the potential of B and can be used to operate the receiving circuits. Under the conditions just stated (*i.e.* wave from B to A) practically no change in potential will occur at B and therefore no signal will be received. Now consider the case of the ether wave travelling in the direction A to B. The additive effect will again occur and on arrival of the conductor wave at B it will be reflected and a potential will be set up which will operate the receiving circuits. The reflected wave travels back along the wire and re-reflection is prevented by the resistance. It will thus be seen that the aerial, besides being fairly sharply directive also is unidirectional. A polar diagram of the receiving power of such an arrangement is shown in Fig. 3. In practice the circuit is not quite so simple since means are adopted to bring the resistance at A to the receiving end B in order that it may be adjusted at the receiving station. The diagram of Fig. 3 is that given by a wire one wavelength long, and it will be observed that although the diagram is good, nevertheless there is a certain receiving power at the back. It is possible to reduce the area of the back loop and means are usually adopted in practice to do so.

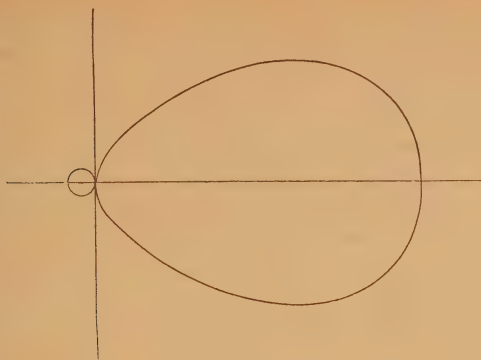


Fig. 3.

The well-known cardioid (Fig. 4) polar diagram given by the combination of a frame and open aerial is also very effective in dealing with directional atmospherics. An advance has been made in the means for combining the aeralis which improves the directivity for X's. For the purpose of balancing, the usual method employed was to adjust the phases of the currents flowing in the frame and open aeralis by suitable mistuning of the circuits. Any such adjustment can be critically exact for one frequency only, and the departure from a true balance for a small change in applied frequency is very considerable if the dampings of the circuits be small. In the modern method the phase adjustment is obtained by the use of a so-called "aperiodic" radiogoniometer, and vertical aerial being very heavily damped by an added series resistance. It is not necessary to enter into details here, but it is obvious that at the minimum the relative phases of the currents in the two aeralis will remain substantially constant over a broad band of frequencies, since the aeralis are nearly aperiodic. Since an X-pulse can be analysed into a spectrum of frequencies, the balance for X's is better than that given by the mistuning method.

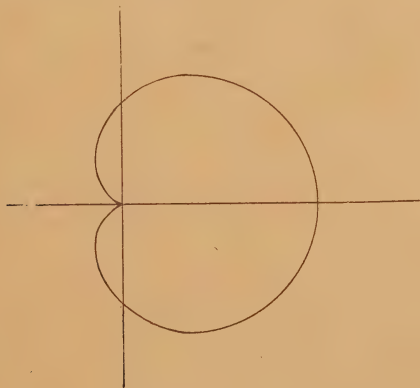


Fig. 4.

The second method of attack on the X problem has lain in the careful development of tuning or filter circuits. If a signal is sent by means of a continuous wave of perfectly steady frequency, then it is theoretically possible to eliminate all atmospherics by narrowing down the band covered by the

resonance curve of the receiving circuit until all frequencies except that of the transmitter are filtered out. Although it is possible to approach near to this ideal in practice, nevertheless, such a receiver would be quite useless since, for reasons which will be made clear, the speed of sending would fall to zero.

Intelligence is conveyed from the transmitter to the receiver by modulation of the continuous wave ("carrier wave") emitted by the former. This modulation is performed in telephony by the voice, in telegraphy by a key or automatic sender of some kind. It can be shown that any such modulation has the effect of producing a series of side waves differing in frequency from the fundamental or carrier wave. The frequencies and intensities of these side waves are governed by the frequencies and intensities of the components in the modulation. Take the case of a carrier wave modulated, by means of an automatic sender, by square dots at a frequency of 50 per second. Now a sequence of square dots can be resolved into a series of sine waves of the following nature:—

$$\sin pt + \frac{1}{3} \sin 3pt + \frac{1}{5} \sin 5pt + \frac{1}{7} \sin 7pt + \dots$$

where n is the fundamental frequency of the dots and $p = 2\pi n$. It can also be shown that if a carrier wave of frequency p is modulated by a sine wave of frequency q then in the composite wave there exist the frequencies $(p - q)$, p and $(p + q)$ forming the so-called "side bands" of a modulated carrier wave. Now in the case of our modulation by square dots at 50 per sec., from the series given above the side waves composing the modulation frequency, must have frequencies of 50, 150, 250, 350 and so on. And since the carrier wave is modulated by all these frequencies; if we suppose the carrier frequency to be 50,000 (6,000 metres wavelength) then the complete band will be:—

..... 49650 : 49750 : 49850 : 49950 : 50000 : 50050 : 50150 : 50250 : 50350, etc., and therefore if the ideally square formation is to be preserved in the received signals, then the resonance curve must be wide enough to embrace all these frequencies produced by modulation. Narrowing down the band covered by the receiving filters produces a rounding off of the corners of the square dots by removing the higher component frequencies in the modulation. This rounding is the essential factor which imposes a limit on the amount of filtering which is allowable in the receiving circuits.

The tendency therefore in a modern automatic receiver is to provide a filter having a resonance band of such a width that at a given speed of working the signals are just sufficiently clear cut to be readily transcribed. When this state of affairs exists, then the maximum reduction of atmospherics is obtained. It is also apparent that the amount of this reduction is dependent upon the speed of working; the slower the speed, the narrower the permissible band to give readability and consequently the greater the weakening of interference from X's. It can be shown that the least rounding of the Morse signals for a given filtering out of X's is produced by a filter having a resonance curve approximating to a square topped band with nearly vertical sides falling sharply to zero. Development has therefore been more or less constrained to the evolution of a filter system which will give the required square band. It is also essential to have the width of the band readily adjustable, since the width controls the speed of working. When conditions improve the decreased intensity of atmospherics allows the band to be opened out and the speed of sending to be raised at the transmitter.

In America work has been done with the object of developing a band filter on the lines of an artificial line. Such a line can be constructed which attenuates all frequencies lying on either side of a certain band very rapidly.

A series of tuned oscillatory circuits in cascade, coupled by means of valves, can also be constructed to give a fairly square resonance curve. Work has been done in England on this idea, resulting in the development of a practical filter system which is at present in use on the Continental and Transatlantic stations of the Marconi Company.

It is important to notice that there is no fundamental difference in the result whether the filtering takes place before or after heterodyning. The only difference is that the equivalent width of band of a beat tone filter is narrowed by the change of frequency when viewed from the standpoint of the original high frequency arriving wave. Consider for instance a wave of 3,000 metres, corresponding to a frequency of 100,000 cycles. If we decide that the band to be covered by the receiver is 100 cycles wide, then a change of 50 cycles per second on either side of the point of resonance must cause a reduction of the received current to a negligible value. If this result is to be obtained by high frequency filtering only, then the band must be so narrow that a change of only 0.05 per cent. results in a complete cut-off. A set of filter circuits to give such a close tuning must necessarily involve a considerable expenditure in stranded copper wire. If, however, the original 3,000 metres wave be heterodyned to give a beat tone of say 2,000 frequency, and the filter be applied to this beat tone then the band must extend over $2,000 \pm 50$ frequency. In this case a change of ± 2.5 per cent. must give a complete cut-off. Such a circuit is obviously more easily constructed. Under these circumstances filtering of the beat tone current is more generally employed. It should, however, be remembered that the heterodyne will give a double beat tone with X's. Those frequencies in the atmospheric pulse which lie both above and below the heterodyne frequency by the required amount will give a beat tone lying in the band of the low frequency filters. Therefore for the best reduction of atmospherics it is necessary in any case to make the band of the high frequency circuits narrow enough to eliminate the second set of X frequencies which would otherwise affect the recorder.

It will be apparent from the foregoing that the success of any band filter system depends entirely upon the emission of a wave of very constant frequency by the transmitting station. Much work has been done in connection with this problem, which presents considerable difficulty in the case of a high frequency alternator. For example, it is necessary to keep the speed of the machine giving a 15,000 metre wavelength so accurately controlled that a frequency variation of 0.1 per cent. shall never occur. Difficult as it may appear, practical means have been developed for very accurate speed control allowing of the use of filters in reception. The whole question, has, however, been very much simplified by the development of the valve transmitter. The simplest type of valve transmitter consists of a bank of three electrode valves controlling the energy supplied to a tuned aerial from a source of high voltage. In such a case the frequency of the pulses applied to the aerial is governed by the frequency of the aerial itself, since the aerial current is made to apply the high frequency controlling voltage to the grids of the transmitting valves. Consequently any variation in the natural period of the aerial circuit will reflect themselves in corresponding variations in the length of the emitted waves. If, however, the high frequency alternating voltage on the grids is controlled by means of a master oscillator instead of by the aerial current, then variations of the natural period of the aerial circuit can no longer effect the frequency of the wave. In this way, the wavelength may be entirely governed by oscillations in a closed circuit, which are extremely constant in frequency and a steadiness can be attained which is all that can be desired from the point of view of the receiver.

The subject of keying the transmitter has also received its share of attention. In America, the development of the magnetic amplifier has simplified the problem, which had hitherto been approached by the use of various types of high speed switch operating in the main power supply to the transmitter. Such switches were either operated by powerful solenoids or by compressed air engines. The use of the magnetic amplifier in connection with high frequency alternators has resulted in a big reduction in the size and an increase in the reliability of the keying apparatus. The keying problem has also been cleared up by the before-mentioned use of a master oscillator

to control a high power valve transmitter. In this case the key may operate on the master oscillator which is of comparatively small power. By this means the control of the power radiated by a high power transatlantic station is provided by a small relay such as is used on normal telegraph lines.

The advances in the art have resulted in a complete change in the whole method of operating wireless circuits. It is now possible to relay the received signals to an ordinary telegraph line and so to dispense with the operating staff which was formerly a necessity for manual retransmission from the receiving station to the point of distribution of the received messages. In the same way the advances made in keying have made it possible to control a distant transmitter reliably from a central office, and no operators are necessary at the transmitting station. In this way all the services of the Marconi Company, both Continental and Transatlantic, are operated direct from London via landlines to the transmitting and receiving stations. The speed of working has also risen very much and this rise has brought in its train the need for keyboard perforators and on Continental services, type-printing receivers.

The whole atmosphere of a wireless telegraph office now resembles that of a landline telegraph office, and wireless services are able to compete with line telegraphs not only from the point of view of lower cost per word, but are also able to offer an equal rapidity of service. Until recently the factor controlling the speed of working was that intangible, but nevertheless very real, quantity known as "conditions." It is satisfactory to note that the speed is now nearly entirely governed by the volume of traffic to be handled.

AERIALS.

By T. L. ECKERSLEY.

THE recent development of aerials has been so extensive that it is hardly possible, in the course of a short article, to do justice to all its aspects. I therefore propose to deal with the subject from the electrical point of view rather than from the mechanical, which is a large subject in itself.

An aerial may be designed (a) for the purpose of sending signals of the required strength to one or more known stations or (b) for the purpose of receiving them. The conditions required in the two cases are very different, and it will be well to consider them separately.

Let us first take the case of transmitting aerials, these being perhaps the most important on account of their necessary size.

The erection of a modern high-power aerial system is a very considerable undertaking, and one that warrants a very careful consideration of all the factors which make towards success. In the first place, it is necessary to ensure that sufficient energy is radiated, so that the signals received are strong enough to overcome all natural atmospheric disturbances. This is a matter of what may be called "radiogeography," and does not concern the designer further than in fixing for him the "ampere-metre" factor to which he must work. This factor is the quantity $\frac{h}{\lambda} \frac{I}{\lambda}$ where h is the effective height, I the transmitting current, and λ is the wavelength used. The energy radiated in watts is 1,580 times the square of this. It will be obvious from this formula that the greater the height, and the greater the current, the greater will be the energy radiated.

At present there is a natural limitation to the height of an aerial. Structures of more than 800 feet are found to be too costly and impracticable to use. Hence, when this limit is reached, it will only be possible to increase the "ampere-metres" of the station by increasing the current.

Again there is a natural limit to the amount of current that can be put into a given aerial structure, because the greater the current the greater becomes the maximum voltage on the aerial, according to the relation $I = 2 \pi \eta C V$, and it has not yet been found possible to make insulators which will stand more than about 120,000 volts in air under all weather conditions.

With this limiting voltage the current is proportional to the capacity of the aerial.

Hence, in order to obtain sufficient ampere-metres for long distance communication, it is necessary to put a large capacity as high as possible—not always an easy thing to do. For certain communications it may be necessary to have 0.1 mfd. at the height of 800, and this means that the aerial will have to be five or six miles in length.

If any genius discovered a method of raising the limiting voltage from 120,000 to 1,000,000 it would be possible to construct an aerial with approximately only one-tenth of the capacity to do the same work.

It is the aim of the designer to provide for as great a capacity at as great a height as possible, with, of course, a minimum number of masts. There is not very much choice in the matter. With a continuous aerial this condition is obtained when the aerial is spread out in a single straight line. The reasons for this may be illustrated by an example. Consider an aerial with a down lead and a long horizontal portion. There will be a certain maximum span allowable between the masts. Let the arrangement have the capacity C , then it is not difficult to show that no other arrangement could have so large a capacity. For instance, if the charged aerial were bent

at the middle mast into a V shape, and the two arms of the V could be brought gradually together, a certain amount of work would have to be done against the repelling force of the similar charges of the two limbs of the V, and the

energy of the system $\frac{1}{2} \frac{Q^2}{C}$ would increase. Since Q , the charge, is constant, C , the capacity, must decrease as the two limbs approach, and it is easy to see that the capacity is a maximum when the aerial is stretched out in a straight line.

In this argument the possibility of returning the end of the aerial on itself, and so reducing the number of masts by one, is not contemplated. This may be an economy in certain cases. These considerations will all be modified, of course, in accordance with economical conditions in the buying of land for the site, etc. The directional properties of the proposed aerial would also have to be taken into account.

POWER REQUIRED.

So far the necessary power to produce the current required has not been considered. In the ideal case, of course, all the power supplied to the aerial would be employed as radiation. In actual practice this ideal condition is very far from being realised, especially on long wavelengths.

The total power consumed by the aerial is $R I^2$ where R is the resistance and I is the RMS current. R is made up of the radiation resistance, R_1 , and the dead loss R_2 . The ratio of the power radiated to the power lost is $\frac{R_1}{R_2}$, and the radiation efficiency of the aerial is $\frac{R_1}{R_1 + R_2}$. To produce the highest possible efficiency it is necessary to reduce the dead losses to a minimum. A great deal of ingenuity has been exercised on this problem, and many and various are the tentative solutions. Before discussing these, it is perhaps worth while emphasizing that the problem does not end with the reduction of the dead losses to insignificance, for even then only the very smallest fraction of the energy radiated has the good fortune to be received. Any device which increases the ratio of the energy received to that radiated, e.g., by directional methods, is a gain.

The problem of reducing the dead losses is already so difficult that the use of directional methods, especially on long waves, must be considered a dream of the future rather than a present day possibility. Far otherwise is it, however, in the case of reception, where directional effects are used to the fullest extent.

Certain general ideas with regard to aerial resistance may be useful as a preface to particular solutions of the resistance problem.

The wires of a big transmitting aerial are mainly horizontal, and the charging currents in these wires have their counterpart in the earth below, which completes the aerial circuit. The main loss being in these earth-return currents, the return path should be as short as possible. About 83 per cent. of this loss is comprised within a space below the aerial equal in breadth to twice the height of the aerial itself. If the height is doubled the return current is spread out over twice the breadth, and the loss is consequently halved, while the power radiated increases fourfold. The advantage of great height is therefore obvious.

A similar argument applies to almost any form of aerial, except a complete circular fan-shaped aerial.

Apart from these current losses, there are "potential" losses to be considered. These occur in any bad dielectrics which happen to be in the electrostatic field of the aerial. In general, they decrease, as the capacity of the aerial is increased, but with a fixed aerial they increase in proportion to the wavelength. These general ideas will make clear the methods by which various experimenters have attempted to overcome the resistance problem.

ALEXANDERSON METHOD.

Suppose we have a number N of similar small aerials, none of which is distant from any other more than a fraction of the wavelength employed, yet all of which are so far apart that the earth currents of any two do not overlap to any appreciable extent.

Suppose now that we produce currents of equal intensity and phase in all the aerials simultaneously, the total power loss of the system will be N times the power loss of a single aerial, while the total power radiated will be nearly N^2 times the power radiated by a single aerial.

The reason for this is clear. The electric and magnetic forces at a distance overlap and are almost entirely in phase, and are each N times the forces due to one aerial. Since the radiated power is proportional to the product of the electric and magnetic forces, it is proportional to N^2 . The ratio of radiation to total loss is therefore proportional to N .

The moral of this tale is that we can make the radiation efficiency as large as we please by multiplying the number of small stations within a restricted area.

The means which Dr. Alexanderson employs for obtaining these results are surprisingly simple. His aerial is really equivalent to a number of small T aerials set out in a line as in Fig. 1.

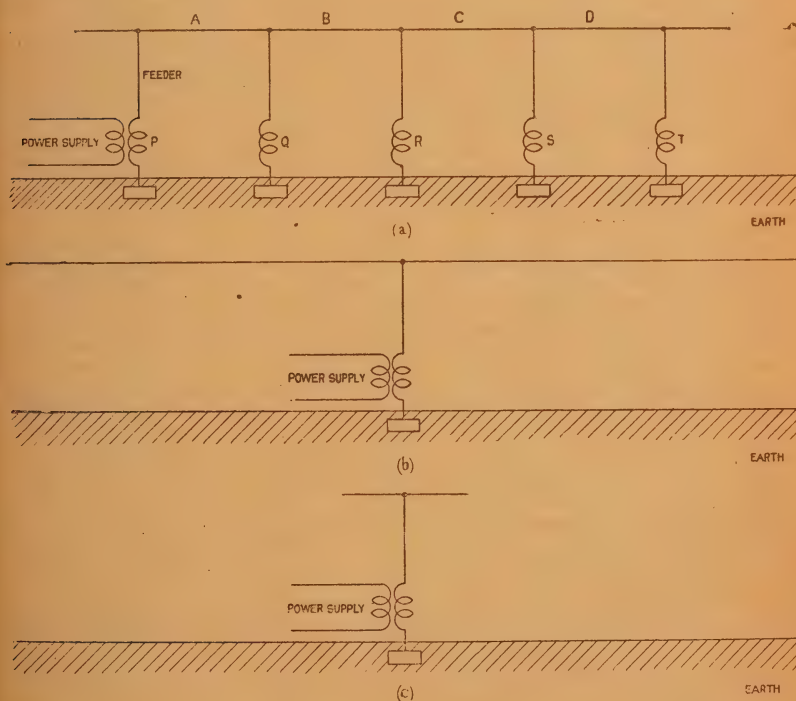


Fig. 1.

This arrangement has the merit of giving the maximum capacity. The aerials are joined together at the points A.B.C., etc., and are fed with power at any of the vertical "feeders." It is not difficult to see that the currents in the aerials P Q R S must be approximately of the same amplitude and phase, for if they were not so there would be a discontinuity of voltage at the joins A B C, which would set up a flow of current tending to equalise them.

In comparing the resistance of the sub-divided Alexanderson aerial (*a*) with the resistance of the same aerial with a single centre feeder (*b*), we must remember that the latter is approximately *N* times the resistance of a single one of the small T aerials (*c*), so that the resistance of (*a*) is roughly $\frac{1}{N^2}$ of the resistance of (*b*).

It might appear at first sight that there was no limit to this process of resistance reduction by sub-dividing, but in practice the limit is soon reached, for each sub-division, which decreases the individual capacity of the small T aerial (*c*) necessitates an increase of loading inductance, the added resistance of which outweighs the gain on subdividing.

The chief drawback to this system is that the losses which depend on the potential (*e.g.*, dielectric and leakage losses) are not reduced by sub-dividing. This is because the potential to which the upper capacity is raised is not changed by putting in the feeders. The total capacity is unaltered, as also is the total current, and it is obviously immaterial which way the total current is fed into the capacity—whether through a number of feeders or at one single point. The total current and capacity being the same in both cases, the voltage is also the same, and the dielectric and leakage losses, which depend on it, are likewise unchanged.

In spite of these drawbacks, very low resistances have been obtained by this method. I understand that the Alexanderson aerial in America have resistance between 0.3 and 0.5 ohms.

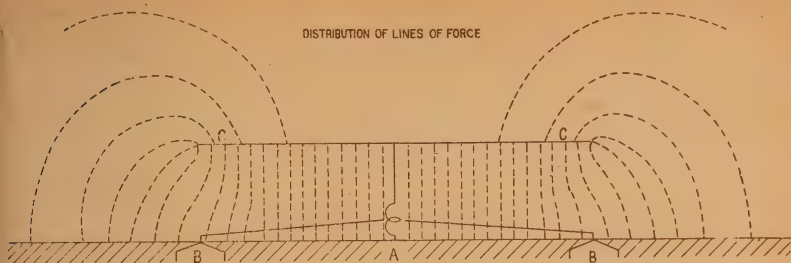
DR. MEISSNER'S METHOD.

Dr. Meissner has developed an interesting method of dealing with earth losses. The basic principle of this method is the feeding in of the current to the earth where it is wanted. To explain this more fully we may take refuge in an example and see how the idea may be applied to a radial type of aerial. If this aerial has a static charge, the charge and the electric force tend to distribute themselves in such a way that the electric energy is a minimum. When the aerial is oscillating on a wavelength long compared with its natural wavelength the distribution of electric force will also be determined by this rule. The dielectric current from earth to aerial, and *vice versa*, will also be distributed in this manner.

It will be seen from Fig. 2 that the maximum density of flow is near the outside edge of the aerial. In the usual method of earthing near the centre the currents have to flow through the earth from A to B before they return to the aerial by the path BC. Dr. Meissner, instead of earthing at A, feeds the current by a low resistance conductor into the earth in the neighbourhood of B, thus avoiding the long earth path A B. This idea is carried into practice in the following manner. The ground beneath the aerial is divided up into squares like a map, and a series of separate earths are planted in these squares. These are fed by separate cables from the centre. Chokes are placed in these leads so as to regulate the relative intensities of the currents, making them proportional to the number of lines of force which naturally fall in their respective squares.

The success of this method depends on employing feeders of low enough resistance.

DISTRIBUTION OF LINES OF FORCE



DISTRIBUTION OF TOTAL CURRENT



Fig. 2.

In common with the Alexanderson system, this method fails to eliminate, or even reduce, the "potential losses," *i.e.*, the dielectric and leakage losses at the surface of the earth.

A very similar system has been introduced at the large new trans-continental station at St. Assise, near Paris, and the total resistance of the aerial, which is of a T form, 3.2 km. long and 800 feet high, is about 0.67 ohms at 15,000 m. In this case the currents in the feeders are regulated by condensers instead of chokes.

THE EARTH SCREEN.

The Marconi Company has developed another method of reducing losses, by the use of what is technically known as an earth screen. This has been described fairly fully in the Proceedings of the Institution of Electrical Engineers (Vol. 60, p. 581). What I wish to emphasise here is the relation of this method to the two already described. The dead losses have been roughly divided into earth return current losses and potential losses, and it has been shown how the methods of Dr. Alexanderson and Dr. Meissner reduce the former without reducing the latter. The aim of the earth screen is to reduce *both* current and potential losses.

The screen, which forms the counterpoise of the aerial is placed between it and the earth, and intercepts the lines of force which would otherwise end on the earth. It consists essentially of a number of wires parallel to the horizontal part of the aerial covering the ground beneath it and extending beyond it and on either side for a distance at least equal to the height of the aerial.

The return currents from the aerial run along the wires of the screen, and except for the small amount which leaks through the screen the earth return currents are entirely avoided.

Those potential losses which occur at the earth's surface are also shielded by the screen, and if this is suitably designed, these losses can be reduced to a very small fraction of their original value.

The extensive use of screened aerials has shown that in actual practice they are of much higher radiation efficiency than the same aerials earthed.

The system has this merit—that it can be combined with the Alexanderson system so as to have the advantages of both. A series of screened aerials can be placed in parallel with the same advantage that ensues in the case of earthed aerials, and the method of paralleling them will be the same. Since each of the aerials has less resistance when screened than when earthed, the combined system will have less resistance than the combined earth system.

With this “feeder and earth screen” system a very long aerial can be used with advantage as regards capacity, and perhaps the most economical arrangement, certainly for all round purposes, is to bend the long aerial into the form of a circle and join the ends, thus reducing by one the number of masts necessary.

The proposed aerials for South Africa and Australia are designed on these lines.

SUMMARY.

It is pointed out that it is necessary to have enormous aerials for long distance radiotelegraphy, and that this necessity is forced on us by the limitation of aerial voltage which cannot be forced above 120,000 volts. If this limiting voltage could be raised there would be a commensurate decrease in the size of the aerial required.

Attention to the insulation problem may in the future solve the chief difficulty in aerial design, but the solving of this problem will only introduce the problem of resistance reduction in an acuter form.

If the size of any aerial is reduced the concentration of current and electric force must be increased, and since the losses are proportional to the square of these the resistance will inevitably rise. Again a reduction in the aerial capacity will necessitate an increase in the loading coil, the resistance of which may be a considerable portion of the total resistance of the aerial.

The improvement of the voltage limit and the improvement of the resistance must therefore go hand in hand if we are to get the full benefit of the former.

As a matter of finance it is the capital cost of the aerial compared with the running costs of power, etc., which has to be considered.

A raising of the voltage limit will probably decrease the former and raise the latter unless very great care is taken in reducing total resistance to the lowest possible figure. This last object may be achieved by no hide-bound adherence to any particular system, but by a careful analysis of all the losses so that they may be located and removed.

VALVE DESIGN AND MANUFACTURE

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(OF THE

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THE thermionic valve is a very perfect relay, rectifier, amplifier and alternating current generator of audio and higher frequencies. There is, therefore, a demand for types covering a very wide range of size and application, so that the limits to the possibilities of the valve are mainly those inherent in design and construction; and the user who understands these limits will best appreciate the behaviour and anticipate the faults in his valves.

THE VACUUM.

Considering first a most obvious point, it is clear that both manufacture and design are dominated by the necessity for a vacuum of a very perfect order. The pressure must be reduced to something like 0.00001 millimetres of mercury. The attainment of this result, indeed the evolution of the valve itself, is the fruit of many years' work, by physicists in many countries, on the various phenomena occurring in gases at low pressure. The methods of evacuation thus slowly perfected have proved very successful when adapted to the needs of manufacture.

In practice, each pumping unit is equipped with a rotary "oil box pump" giving a vacuum down to a pressure of about 0.001 millimetres of mercury, and a mercury vapour pump. The latter will exhaust to a very low pressure, the degree of vacuum being limited by the commencement of gas evolution from the walls of the pump; the lowest figure is perhaps 0.0000001 millimetres of mercury. The "oil pump" consists of a cylinder with blades, rotating in oil, which push the gas before them. It only begins to exhaust when a vacuum of about one centimetre is applied on its high pressure side, usually by means of a reciprocating piston pump. The mercury pump consists of a bath of mercury, heated by a gas ring, and boiling at a low temperature in the vacuum given by the "oil" pump. The vapour from the mercury rises as a blast and passes the opening connected to the vessel to be evacuated. The molecules of gas from the latter are hit by the mercury molecules and driven on towards the outlet leading to the "oil" pump. The mercury vapour itself is condensed by a cold water circulation and falls back into the pool of mercury in globules.

Such a pumping system operates with surprisingly little trouble, wear of the "oil" pump being perhaps the chief difficulty. A trap cooled with liquid air is necessary to prevent the mercury from getting back into the evacuated vessel and a gauge to measure the pressure is also necessary. The latter is usually a "McLeod" gauge, which consists of a bulb about two inches in diameter connected to the vessel to be evacuated; a capillary tube, closed at one end, is sealed on to the top of this bulb, while the bottom is connected to a mercury reservoir. By admitting air into the reservoir the mercury is driven up, compressing the gas in the bulb into the capillary tube. The height to which the mercury rises in the capillary tube is a measure of the vacuum.

It might be thought that with such pumps every molecule of gas would be eliminated from the system. But most valve users will be familiar with the fact that metal and glass contain gas "occluded" or absorbed in their substances. As already mentioned, this absorbed gas sets a limit to the vacuum, as it begins to be liberated from the walls of the vessel when the pressure has been reduced to about 0.0000001 millimetres of mercury; there are then in the "vacuum" some 3,000,000,000 molecules per cubic centimetre. Although this number sounds very large, it is enormously less than the number at atmospheric pressure 2.7×10^{19} per cubic centimetre.

The molecules are so minute that at a pressure of about 0.0001 millimetres of mercury one of them will travel a distance of say 100 centimetres, rebounding off the walls of a vessel before meeting another, and electrons will get across from filament to anode with little chance of collision. Amounts of gas of this order permit an electron discharge practically free from gas ionisation and can be ignored, but the gas which remains in the glass and metal of the valve cannot be neglected.

To a gas molecule the solid walls of the bulb, or the anode, or the grid wires, present a sponge-like front and at atmospheric pressure comparatively enormous quantities of gas are absorbed. Thus molybdenum will absorb several hundred times its volume of gas. The gas so absorbed can be loosened only by heating the parts in a vacuum, or by bombardment with electrons, which is equivalent to intense local heating. Design must, therefore, be directed to keeping the valve cool in use.

On the other hand, considerations of size or output may necessitate the generation of considerable heat, so that a compromise must be made, materials must be chosen which do not absorb gas readily, such as nickel and the nickel chromium alloy known as "nichrome." As little metal as possible must be used which again means compromise, for the internal parts must be mechanically strong. Nickel has the disadvantage that when the occluded gas is driven out by the heat it becomes very soft indeed. Molybdenum and tungsten on the other hand tend to become brittle.

Glass is a troublesome source of gas; on being heated in vacuum it gives up large quantities of water vapour and carbon dioxide; after a time, if the temperature is not too high, the evolution of gas stops and the surface is then comparatively gas free. If, however, the heating is continued nearly to the softening temperature of the glass, an almost ceaseless evolution of water vapour takes place; the evolution is more marked if at the same time the glass is subjected to electron bombardment.

The designer has, therefore, to be sure that no part of the valve will be over heated in operation; it is not sufficient that the average temperature should be right; there must be no single spot anywhere on the inside surface of the bulb at a temperature approaching the softening point of the particular glass used. This is the reason for the use of other materials such as silica or high melting point glasses when it is required to produce high powered valves. But such materials introduce other difficulties of their own, they may be expensive and require special ovens and gas flames in manufacture.

From the point of view of manufacture, the phenomena of absorbed gas mean that all the parts of a valve must be heated in vacua, and the general principle followed is that they should be taken to a higher temperature in manufacture than they will reach when the valve is in use.

The metal parts are given a preliminary treatment in a silica tube connected to vacuum pumps and heated by gas or electrically to about 1000°C. The parts are then assembled, mounted in the bulb, and the valve is connected to the pumps. An oven is lowered over the valve and the temperature raised as near the softening point of the glass as possible. After, say, half an hour of such baking the oven is raised, the anode is connected to a high tension supply, the grid is connected to the anode or to some lower voltage supply, the filament is lighted and an electron discharge takes place. The bombardment of the anode and grid by the electrons at once releases gas which is split up, ionised by the electron discharge, and a blue glow appears. During this period while the pump is exhausting the gas so released, the positive ions of the gas bombard the filament and would soon disintegrate it were the bombardment not stopped or reduced by the operator who switches off or dulls down the filament temporarily. As the bombardment proceeds the evolution of gas becomes less rapid, the blue glow disappears, and the anode becomes red hot. The gauge, however,

shows that gas is still present and the bombardment must be continued for a shorter or longer period according to the design of valve, until there is no cumulative evolution of gas at the maximum temperature for which the valve is designed.

This bombardment is a fairly close approximation to the conditions of actual use, and ensures that any parts subject to the bombardment of stray electrons which do not go direct from filament to anode are sufficiently free from gas.

There are a number of methods of adding substances which, by their action, plaster the gas on the walls of the bulb and keep it there. The most familiar is phosphorous, which is largely used in some methods of incandescent electric lamp production.

THE FILAMENT.

A hot filament familiar as a source of light is used in a valve to give a unidirectional stream of electrons and as such may be said to be the characteristic feature of a thermionic valve. It presents many problems in design and manufacture which will now be considered.

It might be assumed for simplicity that all solid bodies, if they could be made hot enough, would give off electrons. In practice most give off vapour and boil away before they become hot enough to emit electricity. But the more refractory metals, such as platinum, tungsten, thorium, and oxides, such as those of calcium, strontium and barium, will give a large and useful emission at temperatures which they can sustain. Filaments consisting of platinum covered with the oxides mentioned above have been the subject of extensive development in America, but the majority of valves in use at the present time have tungsten filaments run at temperatures from 2,300 to 2,550 degrees. At these temperatures the tungsten is evaporating and disintegrating as well as emitting electrons, and again a compromise becomes necessary, for as we increase the temperature of the filament its emission increases rapidly and the filament watts per ampere emission decreases. On the other hand, as we increase the temperature the life decreases very rapidly; for a given temperature the life increases as we increase the filament diameter.

An example will be instructive. Consider the case of two tungsten filaments, one 0.1 millimetres, one 0.3 millimetres diameter and the effect of running them at different temperatures. Approximate figures for such filaments can be tabulated thus:—

	0.1 mm. Diam.		0.3 mm. Diam.	
Heating current amperes	1.6	1.7	8.2	8.8
Temperature	2,400	2,500	2,400	2,500
Expectation of life in hrs.	1,500	300	2,000	600
Volt drop per cm. length	1.58	1.78	0.93	1.04
Emission current milliamperes ..	20	52	60	155
Heating watts per cm. length ..	2.53	3.02	7.62	9.15
Milliamperes of emission per watt heating current for one centimetre length (approximately) ..	8	17	8	17

The figures given are illustrative only. They are dependent to some extent on the composition of the wire used. In the case of life the published data, though increasing, are not exhaustive and from the nature of the case liable to error. It will be seen from the table that an increase of some six per cent. in filament current increases the temperature a hundred degrees, more than doubles the emission per watt of heating current, but decreases the life to about one-third. Further, that the thicker filament

has considerably longer life than the thinner at the same temperature. This is because failure usually commences with a local thinning, the resistance of the thin place rises, it gets hotter and evaporates faster. With a thicker filament there is not so rapid a temperature rise at the hot spot. The figures given assume that throughout life the temperature is constant, or what is nearly the same, the *volts* are constant. If the *current* is kept constant, as evaporation occurs and the wire thins, the temperature rises and the life will be reduced to a third or less of the figure obtained with constant volts.

Temperature is not the only factor determining the emission from a metal. It depends also on the atomic nature of the surface, being closely connected with the contact potential. Both the latter and thermionic emission depend on the amount of work that has to be done by an electron for it to get through the surface network of atoms. The metal thorium is far better from this point of view than tungsten but volatilises very easily. Recently, however, filaments have been developed making use of the emission of a thorium layer on a tungsten filament run at a comparatively low temperature. The result has long been familiar to valve makers as an accident, but has been brought to a stage where manufacture is possible as a result of close investigation.

ELECTRODE DIMENSIONS.

The electrode dimensions are settled in the first place by the power with which the valve has to deal; clearly there is an enormous range to cover, starting from the wireless receiving valve, which deals with inputs of microwatts, and outputs of the order of a milliwatt or less. Next comes the valve of a loud speaker telephone or local oscillator, giving perhaps a few milliwatts, and after that the series of transmitting valves from 20 watt output valves to the largest, capable of handling some 10 kilowatts in the case of glass or more for metal or silica valves. With increasing power comes increasing size, resulting from the need, first, of more emission from the filament, secondly, the necessity of dealing with greater heat radiation from the anode. Each step in size brings up again the same problems—how to increase the mechanical strength of glass and metal without complications from absorbed gas, how to increase the cooling surfaces, how to get in still more filament, and, since the anode voltage generally increases with size, how to improve the insulation.

The relative sizes of anode diameter, grid diameter and grid mesh necessary for a particular purpose can be calculated with a fair degree of accuracy. For an understanding of the calculation it is simplest to consider a valve used as an alternating current amplifier (*i.e.*, a high frequency or audio frequency amplifier). For such purposes the valve may be treated theoretically as an alternating current generator with an internal resistance R and a voltage MV , where V is the alternating current voltage applied to the grid, and M a factor depending on the dimensions of grid and anode. The factor M is commonly called the amplification factor of the valve and is greater the smaller the diameter and the closer the meshes of the grid. The amplifying power of the valve clearly depends on the M . The importance of the internal resistance R , though very great, is not so obvious. In the first place it determines the magnitude of the external impedance in the anode circuit, which for maximum efficiency should equal R . It has a direct bearing on the shape of the resonance curve of the tuned circuits connected to the valve. It also settles the voltage required to drag any particular value of electron current across the space so that for a given current a valve of high internal resistance requires high anode volts. In this connection it must be remembered as far as receiving valves are concerned that a very small current, say one quarter of a milliampere or less, is enough to give a loud sound in headgear telephones; on the other hand, a loud speaker usually requires several milliamperes.

The internal resistance increases as M is increased. For a given M it decreases as the filament length is increased and as the diameter of the grid is decreased with corresponding opening of the mesh. The internal resistance as here discussed is, of course, the alternating current resistance, which is the slope of the anode volts—anode current characteristic curve.

GENERAL.

It must be remembered that in a three electrode valve there are three circuits, the filament grid circuit, the filament anode circuit and the filament circuit itself. Different types of use bring into prominence various essential features in these circuits. Thus, consider the filament circuit of a valve for use in a shore wireless station or large steamer; here electric power to charge batteries is easily obtained and it matters little if each receiving valve filament requires ten watts or half a watt. In an aeroplane, or a mobile military station, small filament wattage is vital, it is important also to many amateurs. Still more do these factors influence the design of transmitting valves. An aeroplane may be fitted with a valve run so hot that its life is a few hours only, while at a large shore station the design may be such as to give a life of thousands of hours.

An important point about the grid circuit is the magnitude of the grid filament impedance. The ideal valve (apart from its use with grid current rectification) would have no grid current. A reasonably good amplifying valve must have very little and the vacuum must, therefore, be high and the grid wires fine. In a transmitting valve on the other hand considerable grid current is inevitable, in part due to the imperfection of the vacuum when operating hot, in part to the fact that the grid is a fairly large and stout mechanical structure which stops electrons, in part due to the capacity between grid and filament. Such a valve must be designed so that the platinum seal of the grid is large enough not to get overheated, and since it will be used at high anode voltages and in all probability ranges of grid voltage approximating to those of the anode, great care must be taken that insulation between grid, filament and anode shall be good, even though the glass of the bulb be covered with a slight metallic deposit of evaporated nickel and tungsten. The grid current when operating may be comparable to the anode current in amount.

The design of the anode circuit of a valve is clearly influenced very largely by the voltage applied to it. Since there is a limit to the size of filament and its emission, we must, in order to get more power, increase the anode volts. As the voltages become higher more and more care must be taken with arrangements for insulation, and it may be necessary to insulate the anode, not only from the filament and grid, but also from the metallic deposit on the glass. The principles that apply here are much the same as those for designing an insulator for use in rain, since the sputtered metal is usually carried in straight lines, like rain. What is perhaps not so obvious but well known to all valve users, is that the output of a valve bears a close relation to the watts radiated (and conducted) from the anode in the form of heat. The exact relation depends on the design of the circuits but may be anything from twice the dissipation figure for a conservative use, to ten times or more for special purposes. Watts radiated depend on anode surface and on temperature. Hence the use for large output valves of metals such as molybdenum, which can be run at a high temperature without melting or volatilisation. It has to be remembered that all the heat radiated by the anode must pass through the bulb. Silica has an advantage here since it transmits radiant heat more readily than glass, while metal envelope valves can be cooled by dipping in oil and water. The development of the latter is rendered difficult by the necessity of insulating the electrodes. Some insulators, usually glass of considerable size, must be sealed into the metal envelope. This is a more difficult operation than the converse one of sealing a platinum or tungsten wire into glass.

Those who see a large transmitting valve for the first time are probably astonished at the intricacy of the glass work, and the difficulties of making it must be obvious. A more subtle trouble, however, rises from the electrolysis of the glass. Cold glass is a good insulator; on heating it up the resistance falls rapidly and the figure at a given temperature varies enormously with the composition of the glass. Thus at 300° C. one glass may have ten times the specific resistance of another variety. The effect of this is serious, as a current may pass between the leading in wires, say, between the two legs of the filament, or between anode and grid and filament if too close together. As soon as a current begins it heats the glass locally and the effect is cumulative, resulting in deposition of lead from the glass followed by the appearance of cracks. The remedy is to use a glass chosen for its high insulation and avoid dangerous temperatures.

The leading-in wires present problems of their own, especially when required to carry large currents. Joints between metal wires and glass tend to be unsatisfactory as the diameter of the wire is increased, requiring special design and precaution in manufacture. The current passing through the seal must be kept within limits where it will not heat up the wires in the glass and so open the way for electrolysis.

The design of rectifiers follows closely that of the three electrode valves. It is usually simpler since the grid is omitted. At very high voltages, 30,000 or 40,000 new difficulties begin to appear, due to stray electron bombardment, so that special precautions must be taken to reduce this.

MULTIPLE AERIAL ARRANGEMENTS

BY DR. ENG A. MEISSNER.

From a practical point of view it is necessary that a modern transmitting system must often be able to work simultaneously with a large number of transmitters, and accordingly with several aerials which are partly suspended from the same masts. In this case mutual reactions of the aerials occur; they are produced by a magnetic coupling of the aerials in case of short waves, and by a capacitive coupling in case of long waves. The voltages which are produced by these two kinds of couplings are different in phase by 180° . In both cases the aerials can be completely centre-coupled by special centre-coupling arrangements, and therefore it is possible to work with equal, or nearly equal, wavelengths, even if the aerials are very close together and consequently very strongly coupled. If the wavelengths of the aerials are different, and if both aerials have to be completely centre-coupled, a special centre-coupling arrangement is necessary for each wave.

BECAUSE of the high demands which are put to our high-power wireless transmitting stations, it is often necessary that several transmitters and several aerials which are electrically separated from one another should work simultaneously. All the transmitters are appropriately placed into one single building. On the one hand the same masts, or at least some of them, must sometimes be used for several transmitting aerials, and on the other hand, in case of bad atmospheric conditions, several aerials have to be connected to one large aerial. A great difficulty is encountered, as only a small waverange is at the disposal of the high-power wireless stations, and consequently two transmitters, and correspondingly two aerials close together, have to emit waves of nearly equal length. The two above-mentioned wavelengths are only so slightly different from one another that they can only just be distinguished by an experienced receiving operator.

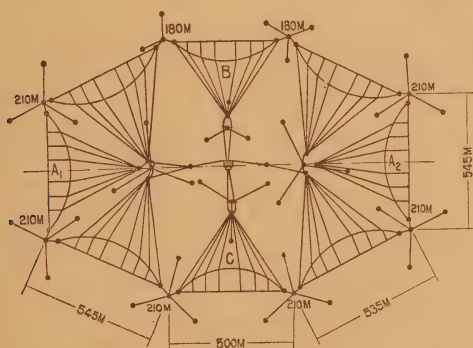


Fig. 1. Ground Plan of Aerial System.

The conditions of course, cause a very strong mutual reaction of the aerials, and it is therefore a question of the greatest importance for a radio-telegraphic plant to determine what kind of mutual reaction this is, and to find means of avoiding or compensating this reaction. This problem had to be solved on a large scale for the central transmitting station, Nauen, now being erected.

Fig. 1 shows the ground plan, and Fig. 2 a model of the new arrangement.

All the aerials are concentrated into the smallest possible area, and special care has been taken that the masts, especially the two centre masts of 250 m. in height, are made use of in the best way possible. (The external masts are 210 m. high.) The arrangement contains four large aerials separated from one another, which are marked A_1 , A_2 , B, C. Besides these, several smaller aerials which are not drawn in this figure, will be suspended from the centre masts later on. All these aerials are L-aerials. It is possible to use the aerials separately or to connect them in parallel at will. For instance, all four large aerials can be connected together.

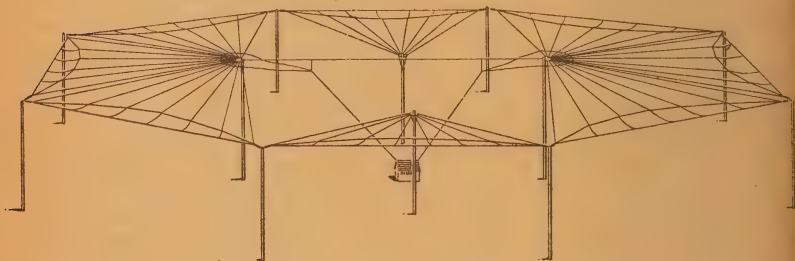


Fig. 2. Model of Aerial System.

The electric dimensions of the plant are the following:—

Aerial.	Capacity.
B and C... ..	each 13,000 cm.
B + C	26,000 cm.
A_1 and A_2	each 35,000 cm.
$A_1 + A_2$	80,000 cm.
$A_1 + A_2 + B + C$	100,000 cm.

When the wavelengths of the two A-aerials, which are farther apart, are different from one another, the mutual reaction is slight; but a great difficulty arises with regard to both aerials and wavelengths being close together, as, for instance, A and B or C. In order to get a clear view in this case, a set of measurements was made with an aerial model in the scale of 1 : 20.

Curve 1 of Fig. 3 shows the current flowing in the C-aerial when the aerial A emits waves of 600 m. (600 m. correspond to the wavelength of 12 km. of the large Nauen aerial), and the aerial C is gradually tuned to the wavelengths 500 m.—800 m. (corresponding to the wavelengths 10 km.—16 km). The current is here measured in percentages of the current in the aerial A_1 . Curve 2 shows the reverse, that is, the current in the aerial A_1 , when the aerial C transmits. We see that even when the wavelengths of the aerials differ from one another by a few per cent., a considerable current, respectively the larger one, passes through that aerial through which it should not flow, that is, we reach a point at which it is impossible to work with both aerials at the same time. Through the two aerials being so close together, and the current passing through the wrong aerial, the radiating effect is only little diminished, but the tuning of the aerials to particular waves causes the greatest difficulty, as every tuning of the one aerial simultaneously reacts upon the sympathy of the other.

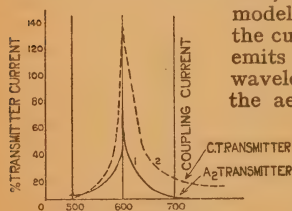


Fig. 3.

Curve K of Fig. 4 shows how strong and of what kind this mutual reaction is. The two model aerials A_1 and C were tuned to the same wave, and one of them was brought into oscillation by a buzzer. The partial waves were then measured, and the coupling between the two aerials calculated therefrom. The coupling-curve appears a little remarkable at first. The coupling, which is V when the wavelength is 420 m., increases whether the wavelength increases or decreases. As the two aerials are here coupled magnetically by means of the connecting-wires, as well as capacitively by means of the lines of force, directly passing over from one aerial to the other, this remarkable coupling-curve can only be explained by the opposing effects of these two couplings. These opposing effects are different when the wavelength is altered. At point M the magnetic coupling is just compensated by the capacitive coupling. We must assume that for shorter waves the coupling is magnetic, according to the schematic diagram of Fig. 5. The two aerials correspond to two current-loops A and B, which act upon one another by induction. The direction of this induction can be determined by the hand-rule. If there is an electromotive force E_A operating in the circuit A, an electromotive force E_{BA} acts on B; the direction of this force is shown by the arrow. The magnetic coupling is here principally done by the self-inductance of the connection wires. When the aerial wavelength is increased the self inductance, especially the mutual induction of the connection wires L_{12} , may be disregarded more and more in comparison

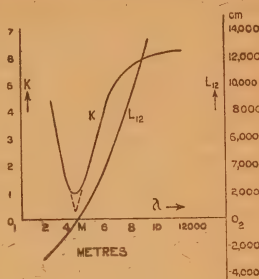


Fig. 4.

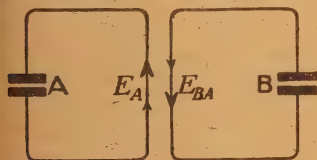


Fig. 5.

with the ever increasing self inductance of the inserted lengthening coils L_1 and L_2 , that is, the magnetic coupling $\frac{L_{12}}{\sqrt{L_1 \times L_2}}$ and its influence becomes less and less. With longer waves, on the right of point M in Fig. 4, the effect of the capacitive coupling dominates.

It is easy to show theoretically* that the magnetic and capacitive

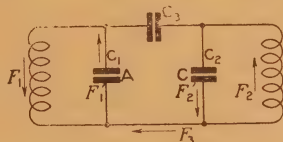


Fig. 6.

coupling are exactly opposed to each other, that is, exactly 180° different in phase. If, according to Kirchhoff's laws, the sum of the currents and that of the voltages at a branching point in Fig. 6 is set down at V, we get:

$$F'_1 = F_1 + F'_2 - F_2$$

$$\frac{F_2}{C_2} + \frac{F'_1}{C_1} + \frac{F_3}{C_3} = 0.$$

respectively:

$$i\omega L_1 F_2 + r_2 F_2 + \frac{1}{i\omega C_2} F'_2 = 0 \quad (1)$$

* Compare: Korshenewski Jahrbuch Bd 19, S. 94.
Korshenewski u.M.Wien Jahrbuch Bd.

If we set down :

$$\frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} = \frac{1}{C}$$

and

$$\frac{1}{C_2} \left(1 - \frac{C}{C_2} \right) = P_2$$

and

$$\frac{C}{C_1 C_2} = -P$$

we obtain, by eliminating F_2 from (I), the equation of the capacitively coupled system :

$$(I) \quad iwL_2 F_2 + F_2 r_2 + \frac{P_2}{iw} F_2 = -P \frac{F_1}{iw} = + \frac{i P F_1}{w}$$

The analogous equation of the magnetically coupled system is :

$$(II) \quad iwL_2 F_2 + F_2 r_2 + \frac{1}{iwC_2} F_2 = -iwM F_1$$

The expression C_2 in the equation (II) consequently corresponds to the expression $\frac{1}{P_2}$ in the equation (I), that is, for the capacity of the oscillating circuit (II) the value $\frac{C_2}{1 - \frac{C}{C_2}}$ has to be used instead of the value C_2 ; for the capacity is enlarged by the two condensers C_2 and C_3 connected in series.

The electromotive force acting upon the second circuit is, in case of magnetic coupling, equal to $i w M F_1$, and in case of capacitive coupling, equal to $\frac{P}{iw} L_1$. As the factors i and $\frac{1}{i}$ denote a phase-displacement of 180° , the electromotive force is exactly 180° different in phase in both cases.

This can also be seen in Fig. 7. The voltage across the condenser C_2 , operating over C_3 in circuit II, has the same direction as the voltage across the condenser C_1 in circuit I, and is consequently opposed to that voltage which is transferred by magnetic induction (Fig. 5).

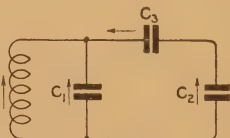


Fig. 7.

The size of the capacity by which the two aerials are coupled can be determined by the coupling values which are found in circuit I by means of a buzzer. In case of mere magnetic coupling the coupling-coefficient is given by

$$\frac{M}{\sqrt{L_1 L_2}} = \frac{wM}{\sqrt{wL_1 \times wL_2}} ,$$

that is, by the ratio of the common inductance of the two circuits ($w M$) to the square root of the product of the inductances of the two single circuits. In order to obtain a similar expression of the coupling-coefficient in case of mere capacitive coupling, the inductances must be replaced by the corresponding capacitive reactances, that is, $w M$ by $\frac{P}{w}$ according to the

equation I and $w L_1$ and $w L_2$ by $\frac{P_1}{w}$ and $\frac{P_2}{w}$ respectively.

It follows that

$$K_2 = \frac{P^2}{P_1 \times P_2}$$

When the values for P_1 and P_2 and the equation $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$ are again used, it follows that :

$$K_2 = \frac{1}{\left(1 + \frac{C_1}{C_3}\right) \left(1 + \frac{C_2}{C_3}\right)}$$

According to curve K in Fig. 4 the coupling of the aerials is 6.5 per cent when the wavelength is 1,200 m. Using the measured static values of the capacities of the model aerials, $C_A = 1,620$ cm., and $C_C = 530$ cm., the equation—

$$K_2 = 0.06 = \frac{1}{\left(1 + \frac{1,620}{C_3}\right) \left(1 + \frac{530}{C_3}\right)}$$

gives the coupling capacity of the aerials

$$C_3 = 61 \text{ cm.}$$

Using this capacity value and the corresponding high frequency resistance we can also easily estimate how much current will pass from one aerial to the other at any wavelength, and in this way we obtain nearly the same values as those which were experimentally found according to Fig. 3.

For an exact calculation it should be taken into account that the currents are not quasistationary, that is, that the capacities of the aerials alter together with the wavelength.

The mutual reaction of the aerials, as shown in Fig. 4, must be eliminated by coupling them, that is, the E.M.F. which is produced by the existing capacitive or magnetic coupling must be compensated by an additional E.M.F. This E.M.F. must have a different value for each wavelength, as, according to Fig. 4, the coupling alters with the wavelength. A simple method for producing this E.M.F. is to let the lengthening coils of the two aerials, respectively part of them, act upon each other appropriately and in the right sense. This aim is reached by the above method, both for inductive aerial coupling as well as for capacitive coupling, because the mutual induction is altered by 180° by reversing one of the coils. The size of the required coupling self-inductance can simply be determined for every wavelength by tuning both aerials to the same wavelength and uncoupling them in the indicated way, and then measuring the mutual induction of the two coils. The curve L_{12} in Fig. 4 is found in this way, and shows that for a certain wave (point M) no counter-induction is required; this is the wavelength for which the coupling curve shows its minimum. The uncoupling self-inductance is negative on the left of point M, and positive on the right; that is, the corresponding necessary centre coupling voltages are 180° different in phase.

Instead of the magnetic inductive centre coupling a galvanic centre coupling can be used in connecting both aerials to a common coil, according to Fig. 8 for the left side of M, and according to Fig. 9 for the right side.

The arrangements of Figs. 8 and 9 concern the case that both aerials are tuned to the same wavelength. If the wavelengths of the aerials are different, for instance, $\lambda_A = 400$ m. and $\lambda_C = 600$ m., Fig. 4 shows that the coupling of the aerials would be 1 per cent. at a wavelength of 400 m., and 5 per cent. at 600 m., that is, properly speaking, it would be necessary to use different centre couplings for each wavelength, provided that both aerials are tuned to the same wave. In our case, $\lambda_C = 600$ m., and $\lambda_A = 400$ m., it must be considered that the high frequency resistance of the second aerial will be rather great for the passing of the wave of the first aerial, as the aerials are detuned by almost 50 per cent. Accordingly only little current

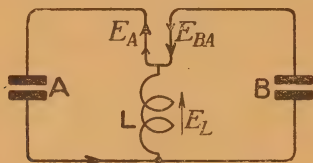


Fig. 8.



Fig. 9.

passes from A to C. As Fig. 3 shows, scarcely 2 per cent. of the current flowing in A are transferred to C, and if the wavelength of the transmitter C is 400 m., scarcely any current can be found in A. When the wavelengths are very different no centre coupling of the aerials is necessary, but when the difference is small, the currents in both aerials greatly increase, as Fig. 4 shows, and then the centre coupling must be made for each wave separately.

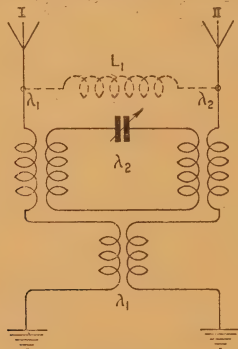


Fig. 10.

Fig. 10 shows a technical solution of this problem. The wave λ_1 is uncoupled by a simple magnetic centre coupling arrangement, and the wave λ_2 by a circuit which is tuned to λ_2 and connected to the aerials, as shown in the drawing. This circuit, through which the wave λ_1 cannot pass, prevents the centre coupling of λ_1 being altered in any way; but, on the other hand, this circuit makes it possible to adjust the phase as well as the amplitude of λ_2 in such a way as is necessary for centre coupling this wave. Instead of this intermediate circuit, a coil L_1 (dotted line in Fig. 10) can be connected (according to Alexanderson) to both aerials in order to centre couple the second wave.

As a rule it is sufficient in practice to centre couple one aerial, when the difference of the wavelengths is 6—20 per cent.; but when the difference is greater no centre coupling arrangement is necessary.

PATENTS

- (A) Valve Patents for 1922.
- (B) British Patent Specifications.
- (C) Name Index to British Patents.
- (D) U.S.A. Patent Specifications.
- (E) Name Index to U.S.A. Patents.

VALVE PATENTS FOR 1922.

By I. SHOENBERG.

No. 145,421. By SIEMENS & HALSKE AKTIENGESellschaft.

If we consider the complete anode circuit of the triode amplifier and denote the potential drop across the triode and output circuit by v_1 and v_2 , we must have at any moment :

$$v_1 + v_2 = E$$

where E is the voltage of the H.T. Battery. On the potential of the grid becoming more positive the current increases. As the resistance of the output circuit is constant, v_2 also increases. Since E is constant, it follows that v_1 must decrease. In other words, the anode potential decreases with increase of grid potential and *vice versa*. It is easily realised that these variations of the anode potential will affect the degree of amplification unfavourably. Indeed, the decrease of the plate potential has a retarding effect on the electrons emitted from the filament, which means a decrease in current. It is clear that the full increase of current which ought to have followed upon the increase of the grid potential is not obtained in view of the drop in the plate potential. In the same way a decrease in the grid potential is not fully utilised either, owing to the increase of the plate potential. In order to improve the efficiency of the amplifying triode, it is proposed to place an additional grid between anode and grid and to connect it to a point in the H.T. battery which will maintain it at a positive potential. The value of the latter is to be chosen in correspondence with the position of the additional grid in the electrostatic field between anode and cathode. The effect of such a "protective net" is explained as follows :

"The peculiar action of the protective net is explained by the fact that it protects electrostatically the field in the vicinity of the auxiliary electrode against the field of the anode, while at the same time the field directed from the protective net to the auxiliary electrode and partly extending into the space between cathode and auxiliary electrode causes the electrons to pass through the auxiliary electrode even in the case where, as is recommendable also for other reasons, the auxiliary electrode is given a potential that is lower than that of the cathode. In other words, the action of the protective net with regard to the field of the cathode is approximately the same as that of the anode, it protects, however, this field against fluctuations due to the fluctuations of the anode potential in correspondence with the anode current."

"In order to provide against a substantial part of the current being short-circuited into the protective net, the potential of the protective net, in such tubes, which are mainly operated with electron currents is kept lower than the potential of the anode. Where space-charging effects need not be feared, the potential is kept even lower than that which would be obtained with the anode voltage used, but without employing a protective net, at the point of fixation of this latter, that is to say at the point where this net is disposed."

No. 147,147. By THE BRITISH THOMSON-HOUSTON Co., LTD. (Assigned By E. F. W. Alexanderson.)

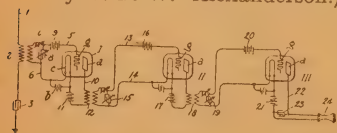


Fig. 1.

The specification describes a method of arranging several triodes in cascade in such a manner that the ratio between the strengths of the desired signal and an interfering one can be considerably increased.

One embodiment of the invention is shown in Fig. 1. Suppose the coupling between antenna 1 and closed circuit 3 and the sharpness with which the latter can be tuned are such that two signals

of the same amplitude but differing by a certain amount in frequency impressed from the antenna on the closed circuit produce there oscillations with relative amplitudes 1 and .1. Assume further that triode I is so adjusted that both signals are reproduced in the anode circuit the degree of amplification being such that the strength of the desired signal induced in circuit 15 is again 1. If the selectivity is the same as for circuit 8 the undesired signal will possess only a strength .01 in circuit 15. By connecting circuit 15 across grid-filament of the triode II it will be clear for the same reasons as above the strength of the interfering signal will be reduced to .001 in circuit 19. It follows that interference will be greatly reduced in relation to the desired signal by using a sufficient number of sharply tuned circuits coupled to each other through triodes.

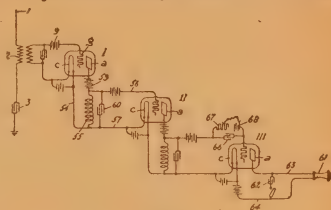


Fig. 2.

A further example is illustrated on Fig. 2. Here the principle is the same, only the tuned circuits (e.g. 55-60) are so arranged that each of them forms the anode circuit for one triode and at the same time the grid circuit for the next one.

No. 147,148. By THE BRITISH THOMSON-HOUSTON Co., LTD. (Assigned by I. Langmuir).

The specification describes the method, which has now become classical, of employing the triode with a condenser shunted by a high resistance placed in the grid lead for detection. The explanation of the operation of the circuit by the inventor is exactly the same as the one given in most modern text-books. It will therefore suffice here to quote the first 3 claims, which read as follows:—

- "(1). A wireless signalling system including an electron discharge device having connected to its grid or control electrode a condenser which has a leakage path connected across its terminals, for the purpose specified."
- "(2). A wireless signalling system including an electron discharge device having an electron emitting cathode, a co-operating anode and a grid for controlling the electron discharge, a condenser connected in circuit with the grid and a high resistance to shunt the condenser."
- "(3). A receiver for wireless signals provided with a grid leak comprising a high resistance preferably in series with a source of electromotive force, connecting the plates of a condenser included in the grid circuit of a three-electrode electron discharge device."

No. 147,441. By GESELLSCHAFT FUR DRAHTLOSE TELEGRAPHIE m.b.H.

The subject matter of the invention is clearly stated in the claims, which read as follows:—

- "(1). An electronic tube or triode of which the cathode is formed of an alkaline earth metal."
- "(2). An electronic tube or triode of which the cathode is formed of calcium."
- "(3). An electronic tube or triode of which the cathode is formed of magnesium."

No. 147,616. By THE BRITISH THOMSON-HOUSTON Co., LTD. (Assigned by I. Langmuir.)

The invention relates to the construction of grids for triodes. An inspection of the drawings (Figs. 3, 4, 5 and 6), and an examination of the first six claims quoted below will sufficiently explain the subject-matter of the patent.

"(1). An electron discharge device comprising an evacuated envelope containing an anode, a cathode and a conductor serving as a discharge controlling electrode wound about a rigid framework spaced about the cathode."

"(2). An electron discharge device as claimed in Claim 1, in which the discharge controlling electrode consists of a wire wound to and fro on the framework with closely adjacent turns to form a grid located between the cathode and anode."

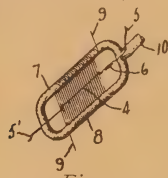


Fig. 3.

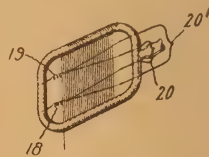


Fig. 4.

"(3). An electron discharge device comprising an evacuated envelope containing a supporting framework which carries a filamentary cathode adapted to be operated at incandescence and also carries a discharge controlling grid surrounding the cathode and is located between the cathode and a co-operating anode."

"(4). An electron discharge device as claimed in Claim 1, in which the discharge controlling electrode is wound over rods of insulating material spaced apart and lies closely adjacent to the cathode."

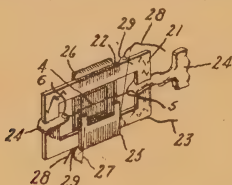


Fig. 5.

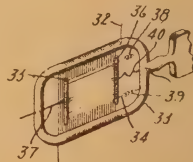


Fig. 6.

"(5). An electron discharge device as claimed in Claim 1, in which the frame bearing the discharge controlling electrode is formed of conductive material."

"(6). An electron discharge device as claimed in any of the previous claims in which both the discharge controlling electrode and the anode are formed of tungsten wire."

No. 148,314.. By E. F. HUTH, G.m.b.H.

The invention relates mainly to the method of evacuating thermionic tubes. The essence of the invention is made clear in the first two claims which read as follows:—

"(1). Process for the manufacture and operation of electron discharge tubes having filament cathodes characterised by the feature that other vapour, alcohol vapour, or benzol vapour, or the vapour of other easily volatile hydrocarbons is admitted to the tube in small quantities and again exhausted, in order to augment the thermionic current and increase the efficiency of the tubes."

"(2) A process as claimed in Claim 1, characterised by the feature that the pumping of the tubes takes place in the presence of *i.e.*, with the gradual exhaustion of the admitted gases or vapours, and with a simultaneous flow of current, so that the metal parts are thereby brought to incandescence."

No. 147,814. BY THE BRITISH THOMSON CO., LTD. (Assigned by I. Langmuir.)

In this specification a method is given of utilising the triode for the purposes of, what one may call, the transformation of D.C. In Fig. 7

1 and 2 are the negative and positive mains respectively of the D.C. supply, the voltage of which it is desired to change. 9 is a transformer for impressing an A.C. potential between grid 5 and filament 6. Suppose that at a certain moment the potential of the grid resulting from the combination of the potentials due to the battery 11 and the A.C. supply is positive; current will flow through circuit 4-6-1-2-3. After a short interval, however, before

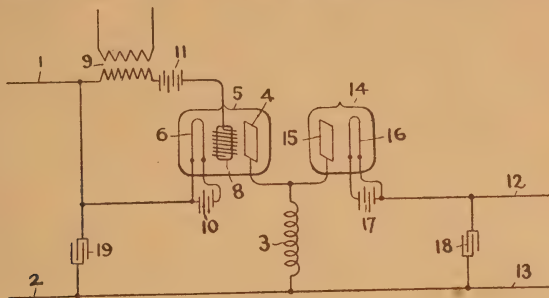


Fig. 7.

the current is built up to its maximum value it will be stopped owing to a change in the sign of the grid potential caused by the A.C. source. Consider now what will happen to the energy "stored up in the medium surrounding coil 3," which is of considerable inductance. This energy will be returned and discharged through the unilateral discharge device 14.

"The energy thus given to the second circuit cannot return to the first, as current can flow in only one direction, through the electron discharge tube 14. It will be seen that by this means a succession of impulses of current is delivered to the second circuit. The frequency of these impulses will depend upon the frequency of the source 9, but they will all be in the same direction. By giving these impulses a high enough frequency and by inserting a condenser 18 between the conductors 12 and 13 a unidirectional and continuous current of constant voltage is secured in the second circuit. The voltage of the current delivered in the second circuit will depend upon the resistance of that circuit. It will also be apparent that by connecting several transforming devices in parallel and exciting their grids by alternating current sources differing slightly in phase relation, a practically continuous succession of current impulses may be delivered in the second circuit. In order to decrease the time required for the current in the coil 3 to build up to the desired value a condenser 19 may be connected across the supply mains 1 and 2."

No. 147,823. By THE BRITISH THOMSON-HOUSTON CO. LTD. (Assigned by I. Langmuir.)

The specification describes a method of heterodyning, somewhat differing from the one usually employed. The main characteristic feature consists in the fact that the locally produced H.F. oscillations are applied between

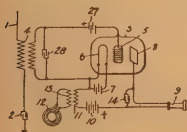


Fig. 8.

plate and filament of a triode, while the signals to be received are impressed between the grid and filament of the triode. Of course, the frequency of the local source is adjusted to differ from that of the signal, in order to obtain an audible note. One embodiment of the invention is shown on Fig. 8. It will be seen that with this arrangement the current flowing through the triode will depend upon the phase difference existing at the moment between the potentials of the plate and grid. Suppose that at a certain moment plate 8 is made positive by the H.F. potential impressed on it from the local source 12 through transformer 13-11. Assume also that at this

moment grid 5 is also caused to be positive by the signal received on the aerial 1. In the result, current will flow through the triode 3. Owing, however, to the difference between the frequencies of 12 and of the signal, after a short interval, both plate and grid will be negative. At that moment, the passage of any current between plate 8 and filament 6 become impossible.

We have taken two extreme conditions and left out all the intermediate stages. It is obvious, however, that the phase difference between the plate and grid potential will be continually changing owing to the difference between their frequencies. The current through the triode will vary correspondingly with the result that a note with a pitch depending on the frequencies of 12 and of the signal will be heard in telephone 9. It should be realised that owing to the above outlined inter-action, rectification will be taking place at the same time. On the whole, the working of the arrangement is very similar to that of the well-known Goldschmidt "tone-wheel."

No. 147,851. By GESELLSCHAFT FUR DRAHTLOSE TELEGRAPHIE m.b.H.

It is well known that the anode current, grid voltage characteristic of a triode is nearly rectilinear only along a certain portion. In the lower part especially, it possesses a "knee" which is followed on by a flat portion almost coinciding with the X-axis. Owing to this, when such a triode is used for generation, or amplification, in certain cases, the oscillations have

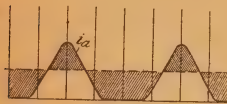


Fig. 9.

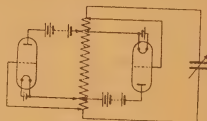


Fig. 10.



Fig. 11.

a shape similar to the one shown on Fig. 9, that is to say, the resulting wave is not of a pure sine form but possesses many harmonics. In order to overcome this difficulty, it is suggested that the triodes should be connected in opposition, as shown in Fig. 10. The characteristic of such a combined device will be rectilinear as will be seen from Fig. 11, provided of course the characteristics of both triodes are identical. The oscillations obtained from such an arrangement will be of a pure sine form.

No. 147,853. By GESELLSCHAFT FUR DRAHTLOSE TELEGRAPHIE m.b.H.

When triodes are employed in cascade one may use for intercoupling purposes, tuned circuits. Great efficiency will be obtained in this manner, but on the other hand the system will be highly selective and whenever it is desired to receive a new wavelength a retuning of all intermediate circuits will be required. Under many circumstances this is undesirable and the present invention proposes to overcome this difficulty by employing for the inter-coupling of the several triodes the so-called "chain-conductors" or filters.

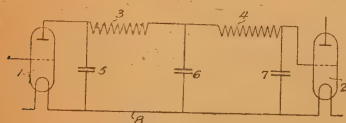


Fig. 12.



Fig. 13.

In Fig. 12, the chain-conductor for connecting the triodes 1 and 2 is made up of inductance coils 3 and 4 and condensers 5, 6, and 7. The behaviour of such a composite conductor for various frequencies is amenable to calculation, but it will suffice here to consider only the qualitative side of the question. It is obvious with the arrangement shown on Fig. 12,

the condensers 5, 6, and 7 will present a very high impedance to long wave oscillations. As the frequency increases the impedance of the condensers decreases. The inductances behave in the opposite manner. We would expect therefore a large potential difference at the terminals of 7 for long waves. On the other hand for short waves the potential difference will be small owing to the almost short-circuiting effect of the capacities. In other words with such an interconnecting link between the triodes we should expect a larger magnification on long waves than on short ones. As a matter of fact calculations show that if we draw a graph with the frequencies as

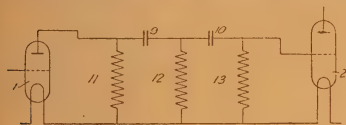


Fig. 14.

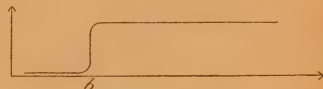


Fig. 15.

abscissae and degrees of amplification as ordinates we shall obtain a curve of the shape shown on Fig. 13. If the places of the inductances and capacities are interchanged as in Fig. 14, the curve shown in Fig. 15 is obtained. If a combination of both methods indicated in Figs. 14 and 15 is employed as in Fig. 16, a curve similar to the one shown in Fig. 17 is obtained. It will be seen that only frequencies lying within a certain narrow band are amplified efficiently. All other frequencies either lower than (b) or higher than (a) will not get through the filter.

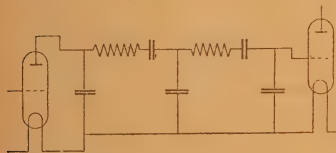


Fig. 16.

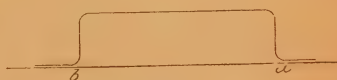


Fig. 17.

No. 148,130. By BRITISH THOMSON-HOUSTON Co., LTD. (Assigned by I. Langmuir.)

The specification describes a method of forming the anode of a diode or triode by depositing on the walls of the glass container a thin gas-free metallic film.

As shown in Fig 18, the device contains originally two filaments. 2 and 3 one is intended to serve as a cathode. The other filament is evaporated by passing a comparatively strong current. The stem 6 is so shaped as to prevent the formation of a continuous film in contact with the filament. The process of manufacture is described as follows:—

"The container is first exhausted to a good vacuum as may be obtained by means of a pump by chemical exhaust or other means, the envelope being heated during pumping to remove water vapour. The preliminary exhaust should reduce the pressure to one micron (0.001 millimetres) or less; the completion of the vacuum may be carried out by the active vaporisation of a tungsten conductor in a side chamber by heating it electrically to about 2,700 to 2,900 degrees Centigrade, preferably in the presence of a small amount of anhydrous pentoxide of phosphorous. The envelope is then sealed off, as indicated at 9, and one of the refractory conductors, for example, the filament 3, is heated to about

2,700 degrees to 2,900 degrees Centigrade, by passage of current, thereby depositing the desired gas-free film as indicated at 10. Contact is made with

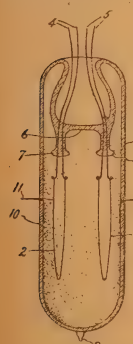


Fig. 18.

the film 10 of vaporised metal by sealed-in wires 11, two being provided to ensure a good contact. This film is gas-free and even when no more than 10^{-6} millimetres in thickness can only with the greatest difficulty be scratched off the glass with a knife."

The current carrying capacity of such films is stated to be about 100 milliamperes and more.

No. **148,131**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assigned by W. C. White.)

The invention relates to a triode generator in which, however, the principle of retroaction is not involved.

It is well known that by properly choosing the values of the anode and grid potentials the grid-current, grid voltage characteristic can be made to have the shape shown on Fig. 19. The main feature of the curve consists in the "falling" portion BC. If the valve is adjusted to a point on this portion, oscillations are generated in a circuit containing inductance and capacity in series for the same reasons as in a Duddell, arc.



Fig. 19.

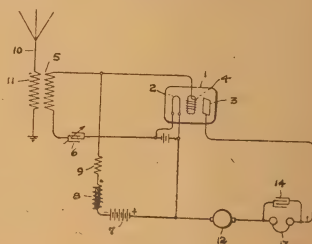


Fig. 20.

One method of utilising a triode working under the above conditions for heterodyne reception is shown in Fig. 20. Here the circuit 5-6-2-4 is tuned to a frequency slightly differing from that of the signals received on antenna 10. The beats thus obtained are rectified and amplified in the anode circuit. The iron-core choke 8 is introduced in order to prevent the circuit of the grid battery 7 from having a short circuiting effect on the oscillatory circuit 5-6. The air-core choke 9 prevents H.F. oscillations from flowing the battery circuit. It is well known that iron-core chokes like 8 are not sufficient for that purpose in view of their self-capacity.

No. **148,447**. By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE m.b.H.

It is known that a valve generator working on the principle of reaction sometimes starts oscillating at an undesirable frequency. The reason for this becomes clear if we consider Fig. 21. It will be noticed that the coupling

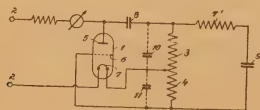


Fig. 21.

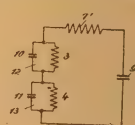


Fig. 22.

between the plate and grid circuits is effected by means of the inductance coils 3 and 4. The connections are made in such a manner as to obtain a phase difference of 180° between the grid and plate voltages. This, as is well known, is a necessary condition for the action of the triode as a generator. Let us now take into account the capacities between anode and filament on the one hand and between grid and filament on the other. These capacities are denoted by 10 and 11 on the drawing. If we redraw for clearness

Fig. 21, we obtain Fig. 22. Any circuit like 12 or 13 inserted between the terminals of an A.C. source may be equivalent to either a capacity or an inductance according to the frequency. Indeed the impedance of a condenser decreases and that of an inductance increases with the increase of frequency. It follows that, generally speaking, the current in the condenser branch will grow while the current in the inductance branch will fall as the frequency increases. Further as the current possesses with respect to the applied E.M.F. a lag of 90° in the inductance and an advance of 90° in the condenser the resulting current is determined by the difference. Therefore, if the frequency is so high that the condenser current is larger than that flowing in the inductance coil, the resulting current will be in advance of the E.M.F. and the whole circuit will behave as a capacity and *vice versa* for lower frequencies the whole circuit will behave as an inductance. It is clear now that the circuit 13-12-7'-9 has two degrees of freedom:—

(1). When circuits 12 and 13 are both equivalent to capacities the condenser has to be considered as connected in series with condensers equivalent to circuits 12 and 13. The resulting capacity will be small and the natural wavelength short.

(2). When circuits 12 and 13 are equivalent to inductances the natural wavelength will obviously be long.

There is of course the possibility of circuit 12 say, being equivalent to a capacity and circuit 13, to an inductance. We need not, however, consider the case, for the plate and grid potentials will then possess a phase difference other than 180° and the valve will not oscillate.

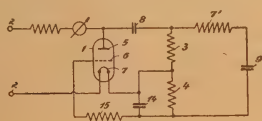


Fig. 23.

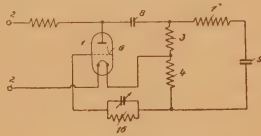


Fig. 24.

We see now why the valve may start oscillating at a frequency different from the one desired. In order to overcome this difficulty it is proposed in the specification to introduce impedances in such a manner as to make the conditions for the undesirable frequency unfavourable. Fig. 23 shows one method of attaining this end. It will be seen that a condenser 14 has been introduced in parallel to coil 4. Referring back to Fig. 22, we find that this means increasing considerably the capacity of condenser 11 in circuit 13. In the light of the explanations given above we see that for the short wavelength the potential across 4 will be small since condenser 14 serves as a short-circuit for this frequency. Owing to this the retroaction from the anode to the grid circuit will be reduced and its valve may be made insufficient for the starting of oscillations on the short wave.

Another method is shown in Fig. 24. Here a rejector circuit 16 tuned to the undesirable wave is introduced between grid and filament. As this circuit is equivalent to a very large impedance for the frequency to which it is tuned it will be seen that a considerable portion of the potential difference across 4 due to the retroaction will be spent between the terminals of circuit 16. The potential difference between the grid and filament will be small and the effect is again the same as if the coupling between the plate and grid circuit has been reduced to a value which is insufficient for the triode to oscillate on the undesirable wave. On the other hand, in so far as the other wave is concerned the introduction of the rejector circuit will have no effect since its impedance for that frequency is small.

No. 148,992. By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE m.b.H.

The invention relates to the use of triode amplifiers and rectifiers in connection with recorders of the type in which a direct current relay is employed. As shown in Fig. 25 the oscillations received on antenna 1 are

rectified by means of a crystal. The resulting low frequency oscillations are then amplified by triodes 4 and 5 and impressed between grid and filament of triode 9. The grid of the latter is adjusted by means of

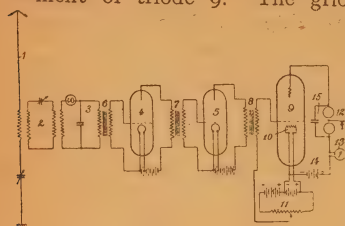


Fig. 25.

amperes are mentioned in the specification.)

potentiometer 11 to a negative potential of such a value that no current will pass through the tube and the windings of the relay 12 connected in the anode circuit. On the arrival of signals, however, the grid will become less negative during the positive half-cycles and the electromagnets of the relay will become energised. Triode 9 it will be realised, acts both as a rectifier and amplifier and its dimensions are comparatively large as it has to deal with large currents. (Values of 5-10 milli-

No. 149,214. By S. Loewe.

This relates to an arrangement for modulating in sympathy with the voice the H.F. currents radiated from an aerial. As will be seen from Fig. 26 the speech currents are impressed through microphone transformer 15 between grid and filament of controlling triode 10. The anode filament path of the latter is connected in parallel to anode filament of generating triode 1. When the microphone is spoken into the conductivity of 10 varies in accordance with the variation of its grid potential thus varying at the same time the amplitude of the H.F. oscillations radiated by the antenna. As the control triode 10 requires smaller anode potentials than the generating triode 1, a counter electro-motive-force 16 has to be used if both triodes are connected to a common high tension source 5.

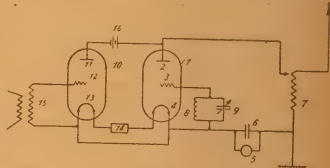


Fig. 26.

No. 149,240. By E. F. HUTH, G.m.b.H.

The invention relates to a peculiar arrangement for receiving with a triode. According to the specification the incoming signal is impressed not between grid and filament as usual, but between the anode and filament. An example is shown on Fig. 27, where it will be seen that anode coil 3 is arranged to constitute a part of the receiving aerial 1. The circuit 13-15 is tuned approximately to the same frequency as the aerial and is connected through a resistance 14 to the grid on the one hand and to the filament on the other.

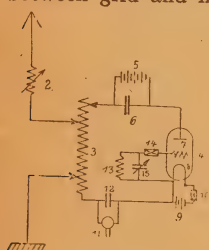


Fig. 27.

It is claimed that with this arrangement, where the incoming oscillations are applied across plate filament, rectification and amplification are obtained. Moreover, for reception of continuous waves it is sufficient to slightly mistune the system; the local oscillations will then combine with the received ones to form beats of audible frequency. It is very hard to account for the working of the arrangement unless one assumes that owing to the coupling between grid and plate circuits (which is unavoidable), the incoming oscillations are after all impressed between grid and filament.

No. 155,789. By L. A. HAZELTINE.

It is well known that in triode generators the alternating current components and anode-potential are out of phase by 180°. This follows first of all from the quite general consideration that the triode is employed for

supplying energy to the oscillatory circuit. Secondly, this is confirmed by the fact that with the increase of current the potential drop across the useful resistance inserted in the anode circuit also increases. As the potential of the high tension supply is constant the anode potential must decrease. It is clear, therefore, that the phase relations between anode-current and anode-potential can be expressed graphically in the manner shown in Fig. 28, where the full line and dotted curves represent the current and potential respectively. The energy consumed in the triode will be determined at any moment by the

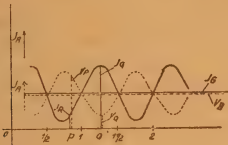


Fig. 28.

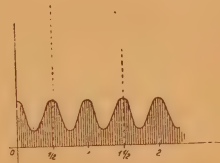


Fig. 29.

product of the corresponding ordinates of the curves, and may be represented in relation to time by the shaded area shown on Fig. 29. If the current curve is to be kept sinoidal the minimum consumption in the triode will take place when the amplitude of the generated alternating current is made to reach such a value that the lower peaks of the curves touch the time axis. When this condition is fulfilled the input power is given by the product J_G and V_B which denote the values of the direct current and battery potential respectively. On the other hand the power consumed will be:

$$\frac{J_G}{\sqrt{2}} \times \frac{V_B}{\sqrt{2}} = \frac{J_G \times V_B}{2}$$

i.e. the maximum efficiency cannot be more than 50 per cent. if the current and potential are to obey the sine law.

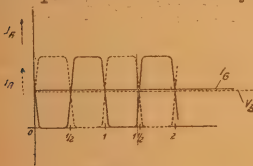


Fig. 30.

The efficiency can be considerably improved if one departs from the sine law. Take for instance the curves shown on Fig. 30. Here, for the greater part of the cycle the state of things is such that when the current is maximum the anode potential is zero and *vice versa*. Owing to this, losses would occur in the triode only during a small fraction of the cycle. On the other hand, however, the curves not being sinoidal, possess

several harmonics. If the oscillations are used for radiation it is most important that these harmonics should not reach the aerial, for otherwise interference will be caused on several wavelengths.

According to the invention high efficiency and a pure radiated wave are obtained by combining two triodes in opposition. In order to get a clear idea of the working of such a circuit we shall refer to Figs. 31-35 explained by the inventor as follows:—

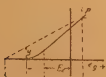


Fig. 31.

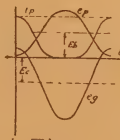


Fig. 32.



Fig. 33.

"In Fig. 32 the variations of anode current i_a , control potential e_g , and anode potential e_p , with time are shown, the control potential e_g varying sinusoidally and biased by a negative battery voltage E_c , the anode potential

e_p , also varying sinusoidally about its battery voltage E_b . The curve of the anode current i_p is derived from that of the control potential e_g by reference to the characteristic curve of Fig. 31."

"In Fig. 33 the deviation y of the anode current from a straight line is shown plotted against the control potential e_g . If the biasing voltage E_c is properly chosen this deviation curve will be substantially symmetrical about a vertical axis. In this case the anode current curve i_p , as shown in Fig. 32, will contain only even harmonics. Having thus substantially eliminated all odd harmonics, the even harmonics may be cancelled out by the use of two like valves connected in opposition to constitute a single oscillator."

"It will thus be seen that in accordance with this invention a symmetrical arrangement of circuits including two valves (or two groups of valves) may be connected so that the even harmonics generated by the valves cancel each other out, and that combined with this arrangement a single biasing control voltage can be provided that will substantially eliminate odd harmonics."

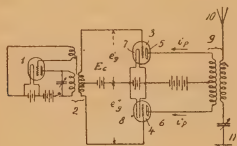


Fig. 34.

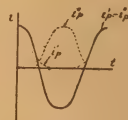


Fig. 35.

"In Fig. 34 such an arrangement as described above is shown in which 1 represents a master oscillator coupled by means of the transformer 2 to the control electrodes or grids 3 and 4 of the power oscillator valves 5 and 6, the secondary of transformer 2 being provided with a midtap leading to the filaments 7 and 8 of the valves 5 and 6 through the biasing battery E_c . The control potential e^1_g and e^{11}_g of the valves 5 and 6 then vary in opposite directions, or in other words are displaced 180° in phase. The anode current i^1_p and i^{11}_p of the valves 5 and 6 are therefore also displaced 180° in phase. These anode currents i^1_p and i^{11}_p flow in opposite directions through the two halves of the primary of transformer 9 and therefore their even harmonics will be in phase with one another and will be without effect on the secondary or antenna circuit 10, 11. The fundamental anode currents will not be cancelled out by this arrangement because they flow in the same direction through the halves of the primary of transformer 9."

"In Fig. 35 the two anode currents i^1_p and i^{11}_p , mentioned in connection with the operation of the circuit arrangement shown in Fig. 34, are shown, with their difference $(i^1_p - i^{11}_p)$; the latter which is sinusoidal, is the effective current acting on the secondary circuit 10, 11."

In the light of the explanations given above in connection with the basic idea underlying the invention there will be no difficulty in appreciating the following statement made in the specification:—

"It is desirable to point out that the anode current of an oscillator should be very small while the anode potential is large; for this will make the loss in the valve low and will improve the efficiency considerably. If it is attempted to reduce all harmonics merely by operating the oscillator over a substantially straight portion of its characteristic curve, the upper limit to the efficiency in the anode circuit is 50 per cent., which would be obtained if the anode current and anode potential just reached zero during each cycle and both were sinusoidal. If, however, even harmonics are permitted in the anode current and are later cancelled out by the use of this invention, then the upper limit to the efficiency is correspondingly 78.5 per cent."

The gain in efficiency is important not only *per se*, but also because comparatively small valves can be employed for large outputs. Suppose the

dimensions of a triode are such that it will stand without damage an internal loss of 2 kW. At an efficiency of 50 per cent. the output can be only 2 kW. At an efficiency of 78.5 per cent. the input will be determined from the equation :

$$X \times \frac{22.5}{100} = 2$$

$$\text{Whence } X = \frac{200}{22.5} \text{ kW.}$$

and the output will be :

$$\frac{200}{22.5} \times 2 = \frac{155}{22.5} = 7 \text{ kW, nearly.}$$

The output with the same triode has therefore been increased 3.5 times.

No. 157,407. By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE m.b.H.

There are two well-known methods for connecting the modulating (or controlling) triode to the generator. The first case is illustrated on Fig. 36. Here the triode 11, the resistance of which is varied by the microphone through transformer 12, is connected, if one may put it so, in series with the generating triode 2 and high tension supply 1. It is obvious that modulation is effected with this arrangement by the variation of the voltage drop across E_a across the generator 2. Take the two extreme conditions :—

(1). The grid 11 is brought to such a negative value by the microphone transformer that no current can flow through 11. Its resistance is then infinite with the result that the voltage drop across 2 will be zero. Therefore, the amplitude of the generated oscillations will also be zero.

(2). The grid of 11 is made so positive that the resistance of this triode becomes very small in comparison with that of 2. E_a will then differ very little from E_m (the voltage of 1), and the amplitude of the generated oscillation will reach a maximum. It will be seen, therefore, that with this method of arranging the controlling valve the modulation may be complete. On the other hand, however, the intensity of modulation is weakened owing to the fact that E_m varies in such a manner as to oppose the effects of the variations in the resistance of 11. Indeed, when the resistance of 11 is small, the voltage across 1 (E_m) diminishes with the result that E_a also diminishes and the amplitude of the generated oscillation is smaller than one would expect ; and *vice versa* when the resistance of 11 increases, E_m also rises and E_a does not reach the minimum value.

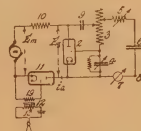


Fig. 36.

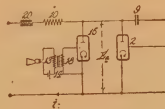


Fig. 37.

The second method of connecting the controlling triode is shown on Fig. 37. Here the current is kept approximately constant by the iron choke-coil 20 placed in the anode lead from the source of supply. During the periods when the resistance of the controlling triode 15 is low the current flowing through it increases, therefore less current will pass through generator 2 and the amplitude of the oscillations will be small. Obviously, the current through 2 can never fall to zero, for this would be possible only if the resistance of 15 could be made zero. It will be seen that while complete modulation can be obtained with the first method (for it is easy to make the resistance of a triode infinite), the same result cannot be obtained with the second for the reduction of the resistance of the triode to values approaching zero is impossible. As to the effects of the variation in the resistance of the triode on E_m , they are evidently just the opposite of those explained above when dealing with the first method.

The invention forming the subject matter of the specification consists in the combining of both methods as shown on Fig. 38. Here triode 11 is in series with, while triode 15 is in parallel to, the generator 2. Both 11 and 15 are influenced by the microphone through a transformer 16 provided with two secondaries 18 and 19 wound in opposition. It follows that when the grid of 15 is made negative, the grid of 11 will be made positive. The resistance of 15 will increase and more current will flow through 2 and the amplitude of the generated oscillation will likewise increase. At the same time the resistance of 11 will decrease, the potential drop across 2 will increase leading again to more powerful oscillations. The two controlling valves thus co-operate in so far as modulation is concerned. On the other hand, if the circuit 20-15-11 attached to the source of supply is considered, it will be seen that its resistance remains practically constant, seeing that the variations in the resistances of 15 and 11 are of an opposite nature. On the whole, a system is obtained which permits of complete modulation, while the potential difference across the supply is not affected by the variations which are necessary for modulation.

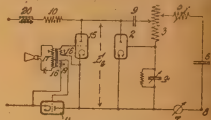


Fig. 38.

No. 160,456. By M. LATOUR.

In cases where several triodes are used for receiving or other purposes it is sometimes convenient to connect all the filaments in series. If, however, one of the filaments is destroyed, all the triodes are put out of action



Fig. 39.

and where many are employed it may become rather troublesome to locate the faulty triode. According to the invention the difficulty is overcome by providing resistances 6, 7 and 8 (see Fig. 39), shunted across the filaments 4 and 5. In case of one of the filaments breaking down, current will still be passing and the remaining filaments will be brought to a dull red glow. The faulty triode can therefore be replaced at once.

No. 160,799. By R. LEVY.

The invention relates to a novel circuit for employing the triode as a high frequency generator. It is based on the so-called "multivibrator" invented by Prof. Abraham, and is shown on Fig. 40.

To understand the working of this circuit, imagine that for some reason the potential of the grid 4 has become slightly increased. More current will flow through triode 1, and the potential drop across the high resistance 9 will increase. As the voltage of battery 11 is given and constant, a greater potential difference across 9 means a smaller potential difference across the triode. The potential of the anode 5 is therefore decreased, and as 5 is connected through condenser 14 to grid 7 the potential of the latter will diminish, less current will flow through triode 2 and therefore its anode potential will increase. In view of the connection of 8 and 4 through condenser 13, the potential of 4 will be further increased. It appears therefore that the current will be continually growing in one triode and falling off in the other. This process, however, will go on only until the grid of one triode becomes so negative that the flow of current is stopped entirely. The potential of point 47 will then practically be the same as of battery 11 and therefore the potential of grid 4 will also remain constant. Of course the process will also stop when the current in triode 1 reaches its saturation value. It will be seen that this state of equilibrium cannot be stable. The charges on the grid will leak off through resistances 18 and 17 and a new process will start in the opposite direction. It follows that oscillations will be generated with a periodicity depending on the values of the resistances and capacities.

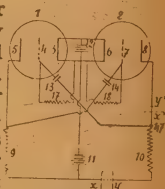


Fig. 40.

From the explanations given above it will be seen that there is nothing which would make us expect that the oscillations would obey the sine law. As a matter of fact the oscillations thus produced prove to possess very many harmonics (sometimes about 150) and this makes the circuit very convenient for calibrating wavemeters. On the other hand, however, the abundance of harmonics renders the "multivibrator" inapplicable to wireless purposes.

According to the invention, Prof. Abraham's circuit is modified by introducing between points x , y or x^1 , y^1 one of the circuits shown on Figs. 41, 42 and 43. The inventor explains the effect of the modification as follows:—

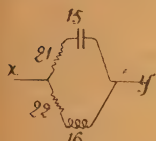


Fig. 41.

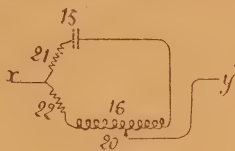


Fig. 42.

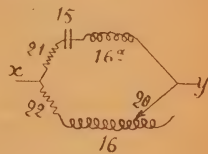


Fig. 43.

"The invention comprises another improvement which is important. It has been observed experimentally that in the arrangement carried out above, the resistance 10 may be dispensed with when a suitable quantity of resistance represented by 21 and 22 is introduced into the oscillating circuits."

"In this form the invention consists finally in replacing one of the resistances of the multivibrator by an oscillating circuit. The tension in the oscillating circuit regulated to resonance for the fundamental period of the multivibrator being in phase with the tension in the resistance 10, as regards this fundamental frequency the conditions of the phenomenon of oscillation are not changed. The same is not true of the harmonics, and in particular with the circuits shown in Figs. 42 and 43, the amplitude thereof diminishes considerably. Thus the new combination realised has, as a result, a great improvement of the efficiency of transformation of continuous energy into alternating energy of the fundamental frequency and a diminution of the harmonics."

Various applications of the modified "multivibrator" circuits, especially to wireless telephony and directional signalling, are illustrated in the specification.

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1922

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
142,870	15/5/17	12,831/20	J. Nienhold	Rectifier
144,305	26/12/18	15,120/20	L. Guinet.	Valve with filament between grid and plate
144,628	12/6/19	14,949/20	W. W. Connors	Control of moving bodies by wireless
145,421	31/5/16	16,430/20	Siemens & Halske A.-G.	Valve with several grids
145,629	6/5/18	17,857/20	Gesellschaft für Drahtlose Telegr. m.b.H.	Direction finding
145,676	13/8/15	17,947/20	Siemens Schuckertwerke G.m.b.H.	Rectifiers
145,677	29/10/15	17,948/20	Siemens Schuckertwerke G.m.b.H.	Rectifiers
145,778	7/12/18	18,154/20	Siemens Schuckertwerke G.m.b.H.	Construction of electrodes for valves
146,122	27/9/18	17,047/20	Siemens & Halske A.-G.	Valves as current limiting devices
146,353	7/7/16	18,313/20	Siemens & Halske A.-G.	Valves in cascade for amplifying
146,354	27/5/19	18,314/20	Siemens & Halske A.-G.	Relays in combination with valves
146,357	13/6/17	18,322/20	E. R. Stöckle	Cathodes for valves
146,491	17/4/19	18,607/20	L. de Forest	Wired wireless with submarine cables
146,529	18/6/14	18,653/20	Radio Corp. of America and R. A. Weagant	Receivers tuned to the note frequency
146,530	5/4/15	18,654/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,531	5/4/15	18,655/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,532	6/1/16	18,656/20	H. Shoemaker and R. A. Weagant and Radio Corp. of America.	Antennæ
146,533	2/4/15	18,657/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,534	24/2/15	18,658/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,535	25/4/14	18,659/20	Radio Corp. of America and R. A. Weagant	Generating and amplifying system
146,536	1/2/16	18,660/20	Radio Corp. of America and R. A. Weagant	Valves in which one terminal of H.T. battery is taken to the mid-point of the filament
146,537	10/3/17	18,661/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,538	10/3/17	18,662/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,539	1/2/16	18,663/20	Radio Corp. of America and R. A. Weagant	Valve with electrode outside evacuated vessel
146,881	1/12/15	18,799/20	Western Electric Co., Ltd., and H. D. Arnold	W/T in which the carrier wave is not transmitted
146,946	8/7/19	16,415/20	B.T.H. Co., Ltd., and W. C. White	Valve generating system
146,997	27/11/16	18,940/20	J. L. Hogan, jr.	Method of eliminating atmospheric
147,037	23/1/18	18,991/20	F. Schröter	Electric discharge apparatus
147,042	29/10/13	18,998/20	E. H. Armstrong	Reaction principle with valves
147,147	29/10/13	19,196/20	E. F. W. Alexanderson and B.T.H. Co., Ltd.	Grid leaks
147,148	29/10/13	19,197/20	I. Langmuir and B.T.H. Co. Ltd.	Grid leak shunted by condenser
147,153	1/3/16	19,205/20	G. Seibt	Telephones
147,428	3/7/14	19,331/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Arc generators
147,430	24/12/15	19,333/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Arc generators
147,431	31/12/15	19,34/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Arc generator in the form of a valve
147,434	24/10/17	19,337/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve generator

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1922 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
147,436	6/12/13	19,339/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Spark transmitter.
147,439	10/11/17	19,342/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Variable condenser
147,441	23/1/18	19,344/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Cathodes for valves
147,445	4/2/19	19,348/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Signalling on trains
147,446	21/5/19	19,349/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve amplifying system
147,462	11/11/15	19,375/20	M. Latour	Valve-generating system
147,463	9/2/15	19,377/20	F. Schröter	Electric discharge tubes
147,465	9/7/19	19,379/20	Société Française Radio Electrique	Method of running H.F. alternators in parallel
147,466	7/5/19	19,380/20	Société Française Radio Electrique	Method of eliminating atmospherics
147,616	16/10/13	19,573/20	B.T.H. Co., Ltd., and I. Langmuir	Construction of grids and anodes for valves
147,699	17/1/19	19,687/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	"Wired Wireless" receivers and transmitters
147,701	2/5/16	19,689/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Method of receiving C.W.
147,702	26/2/14	19,690/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Wireless Telephony: microphone connections
147,753	23/10/18	19,756/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Direction finding
147,756	23/5/19	17,759/20	M. Latour	Wired wireless: method of ampli- fying.
147,758	4/12/18	19,761/20	M. Latour	Method of suppressing tendency of valve amplifiers to oscillate
147,760	25/6/15	19,763/20	M. Latour	Wired wireless: method of ampli- fying
147,802	1/6/15	19,845/20	Société Française Radio Electrique	Method of eliminating atmos- pherics
147,806	5/2/14	19,851/20	B.T.H. Co., Ltd. and I. Langmuir	Valves for measuring purposes
147,811	15/6/18	19,856/20	B.T.H. Co., Ltd. and A. N. Goldsmith	Aerials in the shape of small coils
147,813	23/9/16	19,858/20	B.T.H. Co., Ltd. and E. F. W. Alexanderson	High frequency alternators
147,814	29/12/13	19,859/20	B.T.H. Co., Ltd. and I. Langmuir	Valves as transformers for D.C.
147,816	11/10/17	19,861/20	B.T.H. Co., Ltd. and W. C. White	Valves for amplifying and de- tecting
147,819	31/10/17	19,864/20	B.T.H. Co., Ltd. and W. C. White	Valve with a rectilinear character- istic
147,823	29/12/13	19,868/20	B.T.H. Co., Ltd. and I. Langmuir	Reception of C.W. Resistance- coupled amplifiers
147,836	24/2/17	19,885/20	Société Française Radio Electrique	Heterodyne for reception
147,837	14/12/18	19,886/20	Gesellschaft für Drahtlose Telegraphie	Wired wireless receiving and trans- mitting
147,849	29/9/17	19,901/20	Gesellschaft für Drahtlose Telegraphie	Source of supply of grid potential
147,851	9/1/18	19,903/20	Gesellschaft für Drahtlose Telegraphie	Elimination of harmonics from valve generators
147,853	22/7/18	19,905/20	Gesellschaft für Drahtlose Telegraphie	Cascade H.F. amplifiers
147,855	10/9/15	19,907/20	O. Reichenheim	Method of eliminating atmos- pherics
147,856	23/12/16	19,908/20	W. Kossel	Valve without a heated cathode
148,129	22/12/15	20,031/20	B.T.H. Co., Ltd. and A. W. Hull	Means for smoothing out rectified A.C.
148,130	6/6/14	20,032/20	B.T.H. Co., Ltd. and I. Langmuir	Anodes for valves
148,131	3/6/18	20,033/20	B.T.H. Co., Ltd. and W. C. White	Reception of C.W.: valve generators
148,132	28/10/15	20,034/20	B.T.H. Ltd. and I. Lang- muir	Cathodes for valves containing thorium
148,134	29/12/13	20,036/20	B.T.H. Co., Ltd. and A. W. Hull	Magnetically controlled valves
148,180	6/11/18	20,090/20	Gesellschaft für Drahtlose Telegraphie	Suppression of harmonics from C.W. generators

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148,182	15/10/15	20,092/20	Gesellschaft für Drahtlose Telegraphie	Tickers
148,184	1/3/17	20,094/20	W. Kossel	Valve without a heated cathode
148,221	10/7/14	20,145/20	Allgemeine Elektrizitäts Gesellschaft	Frequency changers
148,312	31/12/15	20,226/20	E. F. Huth and S. Loewe	Larynx-operated microphone
148,313	28/11/16	20,227/20	E. F. Huth, G.m.b.H. and S. Loewe	Larynx-operated microphone
148,314	30/3/18	20,228/20	E. F. Huth, G.m.b.H.	Method of exhausting of vacuum tubes
148,315	1/7/15	20,229/20	E. F. Huth, G.m.b.H.	Aerials for aircraft
148,316	21/10/14	20,230/20	E. F. Huth, G.m.b.H.	Means for checking and recording messages
148,317	30/10/13	20,231/20	E. F. Huth, G.m.b.H.	Portable wireless stations
148,318	16/1/18	20,232/20	E. F. Huth, G.m.b.H.	Aerials for aircraft
148,319	16/5/18	20,233/20	E. F. Huth, G.m.b.H.	Aerials for aircraft
148,320	1/2/16	20,234/20	E. F. Huth, G.m.b.H., K. Rottgardt and B. Rosenbaum	Dynamos for aircraft
148,321	20/12/15	20,235/20	E. F. Huth, G.m.b.H. and S. Loewe	Unit receivers
148,322	18/9/15	20,236/20	E. F. Huth, G.m.b.H. and S. Loewe	Quench spark transmitters
148,323	4/12/14	20,237/20	E. F. Huth, G.m.b.H.	Portable wireless stations
148,324	29/11/16	20,238/20	E. F. Huth, G.m.b.H.	Inductances
148,380	17/7/16	20,308/20	A. V. T. Day	Heterodyne for the reception of modulated waves
148,444	27/5/19	20,399/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Multiplex telephony
148,445	25/10/18	20,400/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve generators
148,446	19/1/15	20,401/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	High frequency alternators
148,447	9/9/18	20,402/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve generators
148,524	4/3/18	20,499/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Inductances
148,525	30/4/19	20,500/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve generators
148,530	18/6/18	20,507/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Directional antenna system
148,786	21/3/17	20,613/20	R. Goldschmidt	Earth system
148,801	3/4/19	20,632/20	L. Kühn and E. F. Huth, G.m.b.H.	Modulation with valves
148,803	27/9/17	20,634/20	E. F. Huth, G.m.b.H.	Valve generators
148,804	8/9/16	20,635/20	E. F. Huth, G.m.b.H.	Switching arrangements for aircraft sets
148,951	21/10/16	20,800/20	M. C. A. Latour	Recorders
148,952	12/12/18	20,810/20	M. C. A. Latour	Inductances
148,955	26/10/16	20,815/20	Société Française Radio Electrique	Modulation with frequency changers
148,990	28/4/19	20,881/20	J. Bethenod	Signalling on trains
148,991	7/8/17	20,882/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Valve generators
148,992	8/2/16	20,883/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Recorders
149,011	31/12/17	20,926/20	E. F. Huth, G.m.b.H.	Duplex system
149,014	2/5/19	20,929/20	E. F. Huth, G.m.b.H.	Valves with 2 grids as amplifiers and generators
149,191	27/9/17	20,930/20	E. F. Huth, G.m.b.H. and B. Rosenbaum	Method of supplying A.C. for valves
149,192	17/7/18	20,931/20	E. F. Huth, G.m.b.H. and W. Heller	Valve generators
149,194	8/12/16	20,933/20	E. F. Huth, G.m.b.H. and B. Rosenbaum	Aerials for submarines
149,195	16/7/17	20,934/20	E. F. Huth, G.m.b.H. and S. Loewe	Valve generators
149,197	14/7/15	20,936/20	E. F. Huth, G.m.b.H. and B. Rosenbaum	Antenna system
149,198	13/10/17	20,937/20	E. F. Huth, G.m.b.H.	Duplex system
149,209	15/12/17	20,956/20	E. F. Huth, G.m.b.H.	Transmission and reception by means of the same valve
149,211	29/12/17	20,958/20	E. F. Huth, G.m.b.H.	Spiral grids for valves
149,212	12/7/20	20,959/20	E. F. Huth, G.m.b.H.	Direction finding

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149,213	4/7/17	20,960/20	E. F. Huth, G.m.b.H., and S. Loëwe	Suppressing tendency of valve amplifiers to oscillate
149,214	29/10/18	20,961/20	S. Loëwe	Modulation with valves
149,215	28/8/17	20,962/20	E. F. Huth, G.m.b.H. and B. Rosenbaum	Duplex system
149,217	11/6/17	20,964/20	E. F. Huth, G.m.b.H. and S. Loëwe	Reaction for receivers
149,218	18/4/18	20,965/20	S. Loëwe	Suppressing tendency of valve amplifiers to oscillate
149,235	18/8/17	20,993/20	E. F. Huth, G.m.b.H., B. Rosenbaum, and S. Loëwe	Relay stations for increasing range
149,237	18/4/18	20,995/20	S. Loëwe	Suppressing tendency of valve amplifiers to oscillate
149,239	12/7/20	20,997/20	E. F. Huth, G.m.b.H. ..	Valves in cascade
149,240	13/10/17	21,003/20	E. F. Huth, G.m.b.H. ..	Valve in which the received signal is impressed between grid and plate
149,272	10/5/15	21,256/20	L. de Forest	Modulation with valves
149,282	28/7/19	21,382/20	Marconi's W.T. Co., Ltd., and A. N. Goldsmith	Method of receiving C.W.
149,954	13/8/19	22,231/20	Hall Research Corporation and R. E. Hall	Method of eliminating atmospherics
149,973	10/1/18	23,347/20	C. Bardeloni	Valves in combination with crystal rectifiers
150,352	25/8/19	24,600/20	L. Levy	Method of eliminating atmospherics
151,253	18/7/19	21,585/20	S. O. E. Trost	Direction finding
151,611	23/9/19	26,994/20	G. Holst, E. Oosterhuis, and N. V. Phillips' Gloeampenfabrieken	Process of removing gases in vacuum tubes
151,651	29/9/19	27,583/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Controlling speed of H.F. alter- nators
151,926	30/9/19	26,654/20	Western Elec. Co., Ltd., and H. A. Affel	Wired wireless: receivers and transmitters
151,968	26/10/18	20,992/20	S. Loëwe	Modulation with valves
152,036	8/10/19	28,452/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Receiver designs
152,311	20/4/18	21,060/20	S. Loëwe	Valve with two filaments and two plates
152,683	21/10/19	28,613/20	H. G. Cordes and T. M. Libby	Method of eliminating atmospherics
152,970	23/10/19	29,957/20	P. J. Laüt	Arc generators
153,267	14/6/19	30,743/20	T. Appleby and L. M. Knoll	Method of eliminating atmospherics
153,576	7/11/19	30,307/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Tikkers
153,597	24/12/14	20,890/20	E. Belin and R. Lenoir ..	Photographic wireless system
154,207	21/11/19	32,915/20	L. Espenschied	Signalling on railways
154,530	27/8/17	33,056/20	Title Insurance and Trust Co. and E. C. Hanson	Low frequency wireless signalling
154,531	4/6/18	33,057/20	Title Insurance and Trust Co. and E. C. Hanson	Low frequency wireless signalling
154,532	4/6/18	33,058/20	Title Insurance and Trust Co. and E. C. Hanson	Control of moving bodies by wireless
154,533	20/2/19	33,059/20	E. C. Hanson	Wireless system for lifeboats
154,534	7/5/19	33,060/20	E. C. Hanson and N. V. Carlson	Method of locating ores
154,884	1/12/19	29,931/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Wired wireless: line problems
154,885	2/12/19	30,306/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Magnetic amplifier
154,908	6/12/19	34,236/20	Société Française Radio Electrique	Controlling speed of H.F. alter- nators
154,925	5/12/19	34,423/20	Siemens & Halske A.-G.	Elimination of speech distortion
155,244	4/12/19	33,570/20	D. G. McCaa	Method of eliminating atmospherics
155,789	28/11/19	36,116/20	L. A. Hazeltine	Valve with a rectilinear charac- teristic
155,800	12/7/20	20,879/20	J. Bethenod	Signalling on railways
156,159	3/12/19	36,630/20	Western Elec. Co., Ltd., and M. K. Akers	Valve generators
156,230	1/12/19	231/21	A. V. Särnmark	Position and distance determination
156,483	18/1/16	356/21	W. Dubilier	Condenser
156,654	11/10/19	638/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Duplex system

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156,855	7/1/20	639/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Method of linking land lines to radio station
156,880	10/10/19	691/21	H. J. J. M. Bellescize ..	Method of eliminating atmospherics
156,760	1/12/19	827/21	A. V. Särnmark ..	Wireless and light signalling
157,205	22/3/17	1,078/21	J. H. Hammond, Jr. ..	Multiplex transmitter
157,207	27/6/17	1,079/21	J. H. Hammond, Jr. ..	Method of reducing intensity of strong signals
157,208	31/7/17	1,080/21	J. H. Hammond, Jr. ..	Method of reducing intensity of strong signals
157,209	25/4/18	1,081/21	J. H. Hammond, Jr., and E. L. Chaffee	Method of eliminating atmospherics
157,258	25/8/14	1,152/21	F. Lowenstein ..	Quenched spark transmitters
157,306	15/11/19	1,217/21	Deutsche Telefonwerke G.m.b.H.	Wired wireless
157,372	15/12/19	1,293/21	W. Burstyn ..	Determination of distance
157,403	29/8/19	1,324/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Reception of C.W.
157,404	2/12/19	1,325/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Direction finding: elimination of errors in connection with
157,407	23/12/19	1,328/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Modulation with valves
157,408	24/12/19	1,329/20	Gesellschaft für Drahtlose Telegraphie m.b.H.	Modulation with frequency changers
157,435	2/12/19	1,362/20	J. Massolle, H. Vogt and J. Engl	Valves with several grids and anodes, and one cathode
157,437	7/4/19	1,364/21	J. Massolle, H. Vogt and J. Engl	Reception of C.W.
157,706	2/12/19	1,406/21	J. Massolle, H. Vogt and J. Engl	Valves with two plates or two grids
157,733	16/4/19	1,434/21	J. Massolle, H. Vogt and J. Engl	Valves in cascade
157,744	9/10/19	1,446/21	J. Massolle, H. Vogt and J. Engl	Valves in cascade
157,748	3/3/19	1,450/21	J. Massolle, H. Vogt and J. Engl	Modulation with valves
157,778	13/11/19	1,486/21	A. Bonnefont ..	Crystal detector
157,889	16/1/20	35,338/20	Société Française Radio Electrique	Duplex system
157,928	24/7/19	1,639/21	E. F. Huth, G.m.b.H., and B. Rosenbaum	Valves in parallel
158,198	16/1/20	2,110/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Calling devices for wired wireless
158,509	22/1/20	2,717/21	N. V. Phillips' Gloelampen-fabrieken	Purifying gases in vacuum tubes
158,510	22/1/20	2,718/21	N. V. Phillips' Gloelampen-fabrieken	Purifying gases in vacuum tubes
158,536	5/2/20	33,004/20	R. Fiedler and K. Hopfner	Wired wireless
158,556	22/1/20	2,850/21	H. J. J. M. Bellescize ..	Application of Baudot apparatus to wireless
158,901	9/2/20	4,536/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Modulation with valves
158,907	9/2/20	4,664/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Signalling in mines
159,463	28/2/20	5,894/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Source of supply of grid potential
159,471	24/2/20	6,161/21	J. Bethenod ..	Signalling on railways
159,472	23/2/20	6,167/21	S. Loëwe ..	Resistance-coupled amplifiers
159,499	25/2/20	2,785/21	D. Reichinstein ..	Method of strengthening weak currents
160,179	16/3/20	8,247/21	P. Trichard ..	Frequency changers
160,456	18/3/20	6,021/21	M. Latour ..	Safety devices for valves
160,730	24/3/20	8,832/21	P. Boucherot ..	High-speed signalling arrangements
160,799	29/3/20	9,180/21	L. Levy ..	Valve generators
160,820	1/4/20	9,471/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Method of linking radio station to land lines
161,157	2/4/20	3,009/21	M. Leblanc-Vickers ..	Cathodes for valves
161,187	6/4/20	9,950/21	D. G. McCaa ..	Reception of C.W.
161,521	9/4/20	10,181/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Elimination of speech distortion
161,580	9/4/20	10,326/21	Marconi's W.T. Co., Ltd., and R. A. Weagant	Reception of C.W.
161,587	15/4/20	10,935/21	M. Leblanc-Vickers ..	Magnetically-controlled valves

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162,288	24/4/20	11,877/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Means for maintaining filament current constant
163,684	18/5/20	7,285/21	P. Bunet	Condensers
163,716	26/5/20	14,545/21	P. Trichard	Frequency changers
164,009	8/12/15	15,062/21	M. Latour	Method of connecting aerials to valve generators
165,037	16/10/19	16,574/21	Société Française Radio Electrique	Method of running H.F. alternators in parallel
165,038	16/6/20	16,588/21	J.O. Mauborgne and G. Hill	Aerials in the form of helices
165,426	3/11/16	17,399/21	Société Française Radio Electrique	Aerials, directional
166,881	23/7/20	14,574/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Relays in combination with valves
167,445	5/8/20	31,147/20	P. O. Pedersen	Arc generators
167,767	10/8/20	21,169/21	E. Binard	Inductances
168,056	17/8/20	21,463/21	Western Elec. Co., Ltd., and R. A. Heising	Modulation with valves
168,649	2/6/20	14,977/20	S. F. Woodell	Direction finding
168,660	4/6/20	15,195/20	Radio Communication Co., Ltd., and N. Lea	Modulation with valves
168,669	5/6/20	15,276/20	B. T. H. Co., Ltd. ..	Manufacture of filaments
168,846	8/9/20	1,451/21	J. Massolle, H. Vogt, and J. Engl	Modulation with valves
168,876	9/9/20	22,273/21	M. H. Petersen	Wireless transmission of writing, pictures, etc.
168,893	29/10/13	23,261/21	B. T. H. Co., Ltd., and I. Langmuir	Resistance-coupled amplifiers
168,925	16/3/20	7,849/20	A. K. Macrorie, S. H. Long, H. Morris-Airey	Direction finding
168,947	10/5/20	12,931/20	B. T. H. Co., Ltd. ..	Magnetically controlled valves
168,966	5/6/20	15,274/20	W. H. Nottage	Method of linking radio station to land lines
168,967	7/6/20	15,316/20	Western Elec. Co., Ltd. ..	Modulation with valves
169,007	15/6/20	16,177/20	A. K. Macrorie and G. Shearing	Modulation with valves
169,250	19/6/20	16,606/20	Radio Communication Co., Ltd., and N. Lea	Modulation with valves
169,305	2/7/20	18,223/20	I. H. Parsons and A. E. J. Bzll	Receiver design
169,442	20/11/15	24,765/21	M. Latour	A.C. supply for valves
169,546	6/7/20	19,009/20	M. Thompson and General Elec. Co., Ltd.	Cathodes for valves
169,582	30/7/20	22,685/20	C. M. A. Nerbonne and V. Armagnat	Wavemeter
169,767	23/6/20	16,980/20	M. Latour	H.F. alternators
169,817	6/7/20	18,909/20	J. Erskine Murray ..	Valves as resistances
169,845	13/7/20	21,179/20	J. Ree, L. B. Turner and Radio Communication Co., Ltd.	Valve generators
169,849	16/7/20	21,450/20	T. H. Gill	Direction finding
169,889	25/8/20	24,688/20	B. T. H. Co., Ltd. ..	Magnetically controlled valves
169,997	6/10/20	26,475/21	H. Abraham	Multiplex transmission and re- ception
170,013	2/12/19	26,802/21	E. F. Huth G.m.b.H. and L. Kuhn	Modulation with valves
170,072	7/7/20	19,387/20	A. K. Macrorie, H. Morris- Airey and S. R. Mullard	Supports for filaments and valves
170,096	10/7/20	20,782/20	G. Shearing, A. K. Macror- ie, H. Morris-Airey and S. R. Mullard	Seals for valves: silica envelope
170,097	10/7/20	20,783/20	G. Shearing, A. K. Macror- ie, H. Morris-Airey and S. R. Mullard	Seals for valves: silica envelope
170,154	5/8/20	23,109/20	C. S. Franklin	Duplex system
170,327	10/6/20	15,717/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Means for supporting electrodes of valves
170,377	17/7/20	21,537/20	J. Scott-Taggart, Radio Communication Co., Ltd. and L. B. Turner	Trigger relay
170,378	17/7/20	21,538/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Modulation with valves
170,582	22/10/20	27,787/21	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Signalling on trains

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Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
170,605	12/4/20	10,204/20	A. Taylor	Arc generators
170,634	10/7/20	20,784/20	A. K. Macrorie, G. Shear- ing, H. Morris-Airey and S. R. Mullard	Means for supporting electrodes of valves
170,656	22/7/20	22,007/20	Marconi's W.T. Co., Ltd. and A. N. Goldsmith	Method of receiving C.W.
170,730	23/8/20	24,438/20	B. T. H. Co., Ltd. ..	Suppressing tendency of valve amplifiers to oscillate
170,893	20/1/21	15,957/20	H. P. Rees	Inductances
170,941	30/7/20	22,703/20	H. J. Round	Method of eliminating interference
170,953	3/8/20	22,941/20	A. K. Macrorie, H. Morris- Airey and S. R. Mullard	Supporting anode of valves: silica envelope
170,954	3/8/20	22,942/20	A. K. Macrorie, T. E. Goldup and S. R. Mul- lard	Supporting electrodes of valves: silica envelope
170,955	3/8/20	22,943/20	A. K. Macrorie, H. Morris- Airey, G. Shearing and S. R. Mullard	Supporting electrodes of valves: silica envelope
171,183	11/8/20	23,565/20	A. K. Macrorie and H. Morris-Airey	Valve generator
171,453	10/8/20	23,391/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Modulation with valves
171,481	16/8/20	23,863/20	H. W. Sullivan and J. Joseph	Variable condenser
171,520	2/9/20	25,378/20	N. Lea and Radio Com- munication Co., Ltd.	Modulation with valves
171,717	20/5/20	13,968/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Reception of C.W.
171,782	23/8/20	24,451/20	A. Young	H.F. Alternators
172,127	2/9/20	25,390/20	A. K. Macrorie, H. Morris- Airey and G. Shearing	Elimination of harmonics from valve generators
172,350	6/7/20	19,063/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Valves in series for reception or transmission
172,376	31/8/20	25,065/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Valves as current limiting devices
172,389	2/9/20	25,370/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Modulation with valves
172,394	3/9/20	25,408/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Method of eliminating interference
172,593	24/8/20	24,547/20	B. T. H. Co., Ltd. ..	Magnetically controlled valves
172,717	10/9/20	26,036/20	R. E. H. Carpenter, F. G. Creed and Creed & Co., Ltd.	Relay (mechanical) for weak currents
172,757	24/9/20	27,189/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Relays in combination with valves
172,758	24/9/20	27,190/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Valve generators
173,284	16/9/20	26,538/20	Western Elec. Co., Ltd. ..	Transmission of call sign for wired wireless
173,320	29/9/20	27,629/20	British Insulated and Helsby Cables, Ltd., and E. A. Bayles	Condenser
173,363	16/10/20	29,304/20	F. Trippe and General Elec. Co., Ltd.	Seals for valves
173,514	28/12/20	34,843/20	H. Abraham	Interrupters: suppression of sparking
173,568	3/9/20	25,426/20	J. Scott-Taggart and G. G. Farley	Means for supporting electrodes of valves
173,621	8/10/20	28,599/20	F. G. Creed and Creed & Co., Ltd.	Relays (mechanical)
173,793	11/5/17	19,376/20	M. Latour	Valve amplifier
173,832	13/9/20	26,241/20	S. Brydon and S. Johnson	Valve generators
174,064	17/7/16	500/22	A. V. T. Day	Method of eliminating interference
174,093	20/10/20	16,712/19	J. M. Furnival	Microphone

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Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
174,134	30/9/20	27,709/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Valve generators
174,149	13/10/20	28,972/20	B. T. H. Co., Ltd.	Valve in which filament is situated between grid and plate
174,298	12/3/21	7,889/21	A. R. Taylor	Means of mounting valves on bases
174,312	25/1/19	421/22	A. V. T. Day	Method of eliminating interference
174,429	22/10/20	29,929/20	H. Abraham and M. Philippson	Radiogoniometers
174,672	21/9/20	26,923/20	International Radio Telegraph Co. and J. L. Hogan	Reception of C.W.
174,975	13/9/20	26,244/20	R. C. Galletti	Tuning of wireless circuits
174,980	4/10/20	28,101/20	A. G. T. Cusins and H. Whittaker-Swinton	Mounting of vacuum tubes
175,052	8/11/20	31,529/20	B. T. H. Co., Ltd. and R. C. Clinker	Frequency meters
175,315	16/8/20	23,861/20	B. T. H. Co., Ltd.	Aerials
175,402	15/11/20	32,225/20	A. K. Macrorie, G. Shearing and H. Morris-Airey	Method of eliminating harmonics from valve generators
175,403	15/11/20	32,226/20	A. K. Macrorie and W. A. Appleton	Reception of C.W.
175,459	2/12/20	34,129/20	F. Reynolds and Silica Syndicate, Ltd.	Supporting electrodes of valves
175,679	12/10/20	28,906/20	C. S. Agate and W. Wilans	Recorders
175,720	15/11/20	32,238/20	S. G. Frost	Aircraft generators
176,127	30/11/20	33,849/20	J. Erskine-Murray and J. Robinson	Direction finding
176,128	30/11/20	33,853/20	H. S. Mills	Design of C.W. transmitters
176,390	5/11/20	33,606/20	W. H. Eccles	Valves in series for detecting and amplifying
176,401	3/9/20	25,451/20	Siemens & Halske, A.-G.	Relays in combination with valves
176,491	6/12/20	34,469/20	L. G. Preston, C. L. Fortescue, H. Morris-Airey and G. Shearing	Multiphase supply for valves
176,892	15/12/20	35,336/20	H. J. Round	Aerials
176,893	15/12/20	35,337/20	C. S. Franklin	Aerials
176,898	16/12/20	35,464/20	L. G. Preston, B. Hodgson and T. E. Goldup	Supporting electrodes of valves
176,932	5/1/21	461/21	N. W. McLachlan	Relays for weak currents : recorders
177,193	19/10/20	29,515/20	P. P. Eckersley and H. J. Round	Method of connecting aerials to valve generating circuits
177,240	20/12/20	35,755/20	W. J. Davis	Calling device
177,267	24/12/20	36,233/20	Marconi's W.T. Co., Ltd. and N. E. Davis	C.W. transmitters
177,269	24/12/20	36,251/20	L. G. Preston, G. Shearing and H. Morris-Airey	Multiphase supply for valves
177,270	24/12/20	36,252/20	L. G. Preston, B. Hodgson and S. R. Mullard	Supporting filament of a valve
177,345	12/2/21	4,995/21	Gen. Elec. Co., Ltd. and A. C. Bartlett	Holders for valves
177,816	30/9/20	27,772/20	J. H. Whittaker-Swinton	Multiphase supply for valves
177,869	4/1/21	297/21	T. L. Eckersley	Aerials
177,912	26/1/21	3,175/21	G. P. Grenfell and J. Robinson	Aerials
177,938	15/2/21	5,248/21	J. S. E. Townsend and J. H. Morrell	Wavemeters
178,397	11/4/21	16,494/21	R. E. J. Varret	Condenser
178,616	9/2/21	4,617/21	B. T. H. Co., Ltd.	Filaments for valves and lamps
178,872	29/10/20	30,576/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Modulation with valves
178,906	19/1/21	2,560/21	B. T. H. Co., Ltd.	Magnetically controlled valves
178,917	21/1/21	2,841/21	T. H. Nakken	Transforming light impulses into electric current impulses
178,957	29/1/21	3,527/21	N. Lea and Radio Communication Co., Ltd.	Call device
178,971	4/2/21	4,228/21	Mitchell's Elec. & Wireless, Ltd. and R. Heather	Modulation with valves
178,992	15/2/21	5,232/21	B. T. H. Co., Ltd. and E. F. W. Alexanderson	Multiplex transmission : aerial system
179,016	25/2/21	6,370/21	Western Elec. Co., Ltd.	Secret system of wireless telephony
179,307	3/2/21	4,091/21	Gen. Elec. Co., Ltd. and F. Trippe	Construction of transmitting valves

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Specifi- cation No.	Date of Applica- tion.	No. of Applica- tion.	Name of Inventor.	Subject.
179,321	5/2/21	4,300/21	P. P. Eckersley, J. M. Furnival, H. R. C. Van de Velde and J. Stewart	Source of supply of current for valves
179,347	19/2/21	5,743/21	B. T. H. Co., Ltd. and R. C. Clinker	Portable receivers
179,568	5/11/20	31,376/21	J. Scott-Taggart	"Negatron"
179,670	12/2/21	5,015/21	L. G. Preston, H. Morris-Airey and G. Shearing	Elimination of harmonics in valve generators
180,069	21/2/21	5,807/21	J. Scott-Taggart and Radio Communication Co., Ltd.	Duplex
180,090	28/2/21	6,641/21	Western Elec. Co., Ltd.	Cathodes for valves
180,349	18/11/20	32,569/20	F. E. Pernot	Separation of different frequencies
180,400	15/2/21	5,231/21	B. T. H. Co., Ltd., & E. F. W. Alexanderson	Method of running H.F. Machines in parallel
180,405	16/2/21	5,392/21	Société des Etablissements Gaumont	Magnetically controlled valve with several anodes
180,542	5/5/21	12,906/21	L. H. T. Holden	Rotary spark-gaps
180,745	28/2/21	6,596/21	W. H. Wilson	Production of H.T. discharges
181,047	19/1/21	2,576/21	O. C. Roos	Arc generators
181,095	3/3/21	7,029/21	G. M. Wright	Multiplex transmission and reception
181,208	30/4/21	12,460/21	N.W. MacLachlan	Means for obtaining high voltage impulses
181,400	4/12/20	34,316/20	J. Scott-Taggart	Method of receiving C.W.
181,483	14/3/21	8,021/21	Deutsche Telefonwerke, G.m.b.H.	Wired wireless
181,489	15/3/21	8,140/21	Deutsche Telefonwerke, G.m.b.H.	Wired wireless
181,514	24/3/21	9,133/21	Deutsche Telefonwerke, G.m.b.H.	H.F. cable telegraphy
181,799	16/3/21	8,277/21	H. J. Round	Reception of C.W.
181,812	17/3/21	8,412/21	Compagnie Générale d'Electricité	Supporting electrodes of valves
181,827	19/3/21	8,630/21	C. K. Chandler	Direction finding
181,909	27/4/21	12,148/21	M. Osnos & Gessellschaft für drahtlose Telegraphie m.b.H.	Frequency changers
182,155	31/1/21	3,709/21	T. D. Parkin	Calling or alarm devices
182,168	21/3/21	8,730/21	C. S. Agate & P. W. Willans	Valve generators
182,218	31/3/21	9,552/21	R. Whiddington	Duplex system of wireless telephony
182,516	7/3/21	7,333/21	H. St. J. de Aula Donisthorpe	Magnetically controlled valves
182,671	20/6/21	16,840/21	J. W. Greenwood	Relays for weak currents. Loud speakers
182,853	8/3/21	7,423/21	Deutsche Telefonwerke, G.m.b.H.	Wired wireless
183,203	12/4/21	10,690/21	Deutsche Telefonwerke, G.m.b.H.	Wired wireless
183,312	30/5/21	14,996/21	G. Krawinkel	H.F. alternators
183,879	7/2/21	4381/21	B. T. H. Co., Ltd.	Magnetically controlled valves
183,896	1/4/21	9,752/21	S. R. Mullaard & Mullaard Radio Valve Co., Ltd.	Cooling electrodes of valves
184,216	24/3/21	9,185/21	J. H. Whittaker-Swinton	Multiphase currents for valves
184,282	13/5/21	13,566/21	W. H. Eccles	Aerial system
184,498	8/2/21	4,513/21	B. T. H. Co., Ltd.	A.C. Supply for valves
184,506	11/2/21	4,904/21	B. T. H. Co., Ltd.	Magnetically controlled valves
184,560	11/5/21	13,426/21	B. T. H. Co., Ltd.	"Dynatron"
184,862	18/5/21	13,952/21	B. T. H. Co., Ltd.	"Dynatron"
184,875	20/5/21	14,143/21	B. T. H. Co., Ltd.	Reception of C.W.
184,903	25/5/21	14,561/21	B. T. H. Co., Ltd.	Arc generator in the form of a valve
184,904	25/5/21	14,573/21	C. S. Franklin & P. P. Eckersley	Duplex system
185,030	9/9/21	24,026/21	Western Elec. Co., Ltd.	Manufacture of electrodes of valves
185,133	17/2/21	5,456/21	J. Scott-Taggart & Radio Communication Co., Ltd.	Valves as current limiting devices
185,167	19/5/21	14,063/21	B. T. H. Co., Ltd.	"Dynatron"
185,169	20/5/21	14,158/21	A. Taylor	Direction finding
185,178	24/5/21	14,453/21	B. T. H. Co., Ltd.	Directional receiving system
185,180	25/5/21	14,518/21	G. H. Moody	Receiver design
185,252	17/6/21	16,718/21	B. T. H. Co., Ltd.	Cooling anode of valve

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1,396,897	8/10/17	P. Thomas ..	Westinghouse Electric and Mfg. Co.	Condenser
1,397,093	27/9/19	L. Espenschied ..	American Telephone and Telegraph Co.	Relay stations for increasing range
1,397,432	16/6/17	C. V. Logwood	—	Relays in combination with valves
1,397,575	9/4/15	L. de Forest ..	De Forest Radio Telephone and Telegraph Co.	Valve with five electrodes for amplifying
1,398,848	30/3/20	J. Erskine-Murray and J. Robinson	—	Direction finding
1,399,005 1,399,251	14/6/18 31/7/17	G. B. Crouse .. E. L. Chaffee ..	Sperry Gyroscope Co. —	Spark gaps Method of reducing atmos- pherics
1,399,254	30/6/17	J. H. Hammond, Jr.	—	System of radiodynamic control
1,399,945	24/7/20	H. F. Elliott ..	A. Taylor	Method of signalling with arc generators
1,400,235 1,400,517 1,400,591	14/9/16 26/4/19 12/3/19	J. H. Payne, Jr. A. E. Blondel .. C. D. Ehret ..	G. E. Co. of America — —	Valve generator Recording apparatus Quiescent system for wireless telephony
1,400,847	31/12/18	E. F. W. Alex- anderson	G. E. Co. of America	Control of speed of H.F. alternator
1,401,121 1,401,644	24/5/18 31/7/17	R. M. Allen .. C. W. Rice ..	Western Elec. Co. G. E. Co. of America	Mountings for vacuum tubes Valves in cascade
1,402,235 1,402,931 1,402,933 1,403,640	22/1/20 18/3/15 6/7/16 20/2/20	H. Jorgenson .. P. C. Hewitt .. P. C. Hewitt .. H. J. Round and G. M. Wright	— — — Radio Corporation of America	Spark transmitter design Valve generator Valve generator Direction finding
1,403,700 1,403,701 1,403,835	30/10/16 22/1/17 30/9/19	F. S. McCullough F. S. McCullough O. B. Blackwell	G. L. Martin .. G. L. Martin .. American Telephone and Telegraph Co.	Directive transmission system Relay Frequency control system
1,403,841	30/9/19	J. R. Carson ..	American Telephone and Telegraph Co.	Frequency control system
1,404,573	13/6/17	L. M. Brillouin and G. A. Beauvais	—	Valve for detecting
1,404,574 1,404,726	25/4/18 14/1/19	L. N. Brillouin .. E. F. W. Alex- anderson	G. E. Co. of America	Valves in cascade Method of removing sleet from antenna
1,405,523 1,405,905 1,406,149 1,406,328	28/12/17 4/2/21 22/1/18 29/1/17	M. C. A. Latour .. F. W. Dunmore .. T. W. Case .. A. L. Atherton	— — — Westinghouse Electric and Mfg. Co.	Valves in cascade Aerials Selenium cell Temperature regulating means for filament of valve
1,406,442	28/12/18	L. Cohen ..	—	Electrostatic-coupled receiver
1,406,445	19/6/19	C. A. Culver ..	—	Photographic receiving appa- ratus
1,406,857	26/10/16	R. A. Heising ..	Western Elec. Co.	Switching over from trans. to recep., and vice versa, for valve generators
1,406,996	30/9/20	J. B. Morrill ..	Western Elec. Co.	Position and distance determi- nation by wireless
1,407,103	17/2/17	F. K. Vreeland ..	—	Method of eliminating atmos- pherics
1,407,205	26/12/16	R. H. Marriott ..	—	Method of eliminating atmos- pherics
1,407,245	18/9/20	J. B. Bolitho ..	—	Relay

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1,408,053	8/8/19	R. J. Wensley ..	Westinghouse Electric and Mfg. Co.	Cathode for valve
1,408,738	23/7/19	G. Hill	L. Steinberger ..	Variable condenser
1,408,992	14/2/21	J. W. Doron ..	S. W. Doron ..	Variometer
1,409,352	20/2/18	S. E. Adair ..	Western Elec. Co.	Inductances
1,409,717	29/10/15	P. C. Hewitt ..	—	Valve generator
1,410,062	10/5/20	G. Holst and E. Oosterhuis	N. V. Phillips' Gloe- lampenfabrieken	Rectifier for A.C.
1,410,730	5/1/20	R. R. Beal ..	A. Taylor	Arc generator
1,410,793	9/11/20	A. Bonnefont ..	—	Crystal detector
1,410,890	8/8/18	J. R. Carson ..	American Telephone and Telegraph Co.	Method of, and means for, modulating carrier oscillations
1,411,814	30/4/18	H. M. Stoller ..	Western Elec. Co. ..	Aircraft installations
1,412,385	17/11/20	T. W. Case ..	—	Selenium cells
1,412,567	30/12/16	J. Mills ..	Western Elec. Co. ..	Method of eliminating atmos- pherics
1,412,853	30/9/19	L. Espenschied	American Telephone and Telegraph Co.	Synchronising system
1,412,908	10/6/20	K. S. Van Dyke	American Telephone and Telegraph Co.	Synchronising system
1,413,732	2/10/16	R. A. Heising ..	Western Elec. Co. ..	Source of supply of grid potential
1,414,232	12/8/19	A. H. Taylor and L. C. Young	—	Method of receiving C.W. with compound heterodyne
1,414,629	15/7/18	M. M. Dolmage ..	—	Duplex system
1,415,179	21/7/20	E. T. Jones ..	—	Switching device
1,415,220	18/6/21	H. F. Causebrook	—	Condenser
1,415,382	17/1/18	J. W. Milnor ..	Western Union Tele- graph Co.	Amplifier
1,415,845	10/2/16	M. I. Pupin and E. H. Armstrong	—	Selectively opposing impedance to received oscillations
1,415,992	22/3/18	L. M. Clement ..	Western Elec. Co. ..	Multiplex receiving system
1,415,999	1/11/16	A. M. Curtis ..	Western Elec. Co. ..	Method of eliminating atmos- pherics
1,416,061	18/12/17	M. J. Pupin and E. H. Armstrong	—	Selective receiving system
1,416,077	8/3/19	D. C. Tanner ..	Western Elec. Co. ..	Modulation with valves
1,416,774	17/4/20	C. Bardeloni ..	—	Method of using crystal de- tectors on combination with valves
1,417,662	16/6/17	L. de Forest ..	—	Valve with 5 electrodes
1,418,066	2/6/20	T. R. Bunting ..	—	Duplex system
1,418,285	10/10/18	J. R. Carson ..	American Telephone and Telegraph Co.	Carrier current telegraphy
1,418,518	20/9/20	E. F. Bell ..	—	Quenched rotary spark gap
1,418,729	25/4/19	A. S. Oswald ..	Western Elec. Co. ..	Aerial for aircraft
1,418,739	4/6/17	E. O. Scriven ..	Western Elec. Co. ..	Valve generator
1,419,528	25/10/18	H. W. Weinhart	Western Elec. Co. ..	Method of supporting electrodes of valves
1,419,530	12/8/18	W. Wilson ..	Western Elec. Co. ..	Method of increasing the emis- sion in valves
1,419,547	12/11/18	C. D. Ehret ..	—	Valves with 5 electrodes
1,419,562	29/9/19	R. V. L. Hartley	Western Elec. Co. ..	Modulation with valves
1,419,797	13/2/19	E. F. W. Alexand- erson	G.E. Co. of America	Valve amplifying system
1,420,055	13/12/20	H. W. Nichols ..	Western Elec. Co. ..	Selective receiving system
1,420,254	20/5/12	J. H. Hammond, Jr.	—	Antennæ
1,420,255	27/2/13	J. H. Hammond, Jr.	—	Antennæ
1,420,256	25/2/13	J. H. Hammond, Jr.	—	System of teledynamic control
1,420,257	21/1/10	J. H. Hammond, Jr.	—	Automatic wave selection
1,420,258	3/9/13	J. H. Hammond, Jr.	—	System for the radio-control of moving bodies
1,420,485	18/5/20	G. F. Johnson ..	—	Variable condenser
1,420,629	29/3/18	J. H. Hammond, Jr.	—	System of teledynamic control
1,422,013	6/2/20	L. B. Turner ..	—	Negative resistance : production of by 2 valves
1,422,312	12/2/19	F. S. Smith ..	Products Protection Corporation	Condenser

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1,422,837	13/10/17	I. B. Crandall ..	Western Elec. Co. ..	Connecting transmitters to valve amplifiers
1,422,882	1/9/15	H. W. Nichols ..	Western Elec. Co. ..	Modulation with valves
1,423,345	20/5/21	D. G. McCaa ..	C. D. Ehret ..	Method of receiving C.W.
1,424,065	27/6/21	E. H. Armstrong ..	—	Super-regeneration
1,424,091	21/1/19	C. R. Fountain ..	—	Valve generator
1,424,141	16/6/19	L. F. Fuller ..	A. Taylor ..	Arc-generator
1,424,294	11/5/22	S. G. Frost ..	—	Aircraft generator
1,424,365	5/4/20	E. H. Loftin and H. H. Lyon	—	Antennæ
1,424,805	16/6/17	L. de Forest ..	—	Subterranean signalling system
1,424,866	17/2/17	P. I. Wold ..	Western Elec. Co. ..	Means for relaying modulated carrier waves
1,425,154	13/12/17	R. A. Weagant ..	Radio Corporation of America	Method of eliminating atmospherics
1,425,522	7/6/17	J. H. Hammond, Jr.	—	Multiplex transmission system
1,425,523	22/6/17	J. H. Hammond, Jr.	—	Transmission system
1,425,912	17/8/20	R. T. Staples ..	Western Elec. Co. ..	Condenser
1,426,132	23/3/17	F. N. Waterman	Radio Corporation of America	Direct-reading wavemeter
1,426,133	12/12/17	R. A. Weagant ..	Radio Corporation of America	Method of eliminating atmospherics
1,426,137	16/4/21	G. M. Wright ..	Radio Corporation of America	Radiogoniometer
1,426,733	14/2/18	R. A. Heising ..	Western Elec. Co. ..	Means for preventing amplifiers from oscillating
1,426,734	30/4/19	W. F. Hendry ..	Western Elec. Co. ..	Supporting electrodes of valves
1,426,743	9/6/22	F. J. Kaehni and W. L. Kaehni	—	" Loud speaker."
1,426,754	23/10/16	R. C. Mathes ..	Western Elec. Co. ..	Circuits for electron discharge devices
1,426,755	9/5/19	H. S. Read and R. C. Mathes	Western Elec. Co. ..	Multi-stage amplifier circuits
1,426,801	21/3/17	W. Wilson ..	Western Elec. Co. ..	Repeater for undulatory currents
1,426,826	19/7/17	H. C. Egerton ..	Western Elec. Co. ..	Circuits for electron discharge devices
1,426,943	23/9/16	E. F. W. Alexander	G. E. Co. of America	High-frequency alternator
1,426,944	4/9/17	E. F. W. Alexander	G. E. Co. of America	Multiplex transmitter
1,427,350	2/9/19	J. Bethenod ..	—	Method of coupling antenna to H.F. alternator
1,427,832	7/7/19	F. S. McCullough	G. L. Martin ..	System of radiotelephony
1,427,833	2/8/19	F. S. McCullough	G. L. Martin ..	Direction finding
1,428,507	12/3/20	E. A. Sperry ..	—	Wireless control system
1,428,856	13/5/18	L. O. Parker ..	Westinghouse Elec. and Manufg. Co.	Spark-gap apparatus
1,429,227	28/9/21	W. Dubilier ..	Dubilier Condenser Co.	Variable condenser

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AVIATION

- (A) Signalling on our Airways.
- (B) Regulations and Procedure—General.
- (C) Regulations and Procedure—Direction Finding.
- (D) Aviation Stations.
- (E) Table of Marks.

A. SIGNALLING ON OUR AIRWAYS.

BY DUNCAN SINCLAIR.*

ONE of the first considerations, if not *the* first, in any system of modern transport lies in the insurance of rapid, accurate and reliable communication facilities between the various stages of the route.

The enormous forward step from the old stage coach days, with their delightful lack of signalling arrangements and frequently of personal security, to the wonderful existing scheme of the up-to-date railway, with all its attendant speed, comfort and reliability, necessitated the origination and operation of signalling arrangements which are still a constant source of admiration to the man in the street and to those whose daily task it is to travel by rail.

The introduction of aircraft on a commercial transport basis, and for the conveyance of passengers and mails, was a step, the magnitude of which could justifiably be compared with the advent of the steam railway train in coaching times, and it at once became apparent that a new and entirely different system of signalling would be necessary in the new scheme of things. No longer could the signals be set against the train bringing it to a standstill in any desired sector of the line. No longer could the various parts of the route be kept clear and the guarantee of a clear line be advertised by the familiar green light or drooping signal arm. And an additional factor to be considered in the smooth running of the system crept in—the factor of weather. The question as to whether it is a fine, clear day or whether it is foggy and raining does not delay the driver of a railroad express in his departure, but weather conditions militate with, however, steadily decreasing ability, against the departure or passage of an air express. To all the ordinary signalling necessary for handling traffic must be added, therefore, a rapid method of disseminating meteorological information along an air route. Again, considerable distances are covered, so that communication with the aircraft themselves is quite essential as they pass along the routes. Radio telegraphy is the one system of communication which fulfils all these requirements most readily; and radio telegraphy and radio telephony, as a consequence, have been adopted and adapted on the Air routes. The place already occupied by wireless in the mercantile marine bids fair to be out-rivalled by that of the aerial traffic of the future. There are territorial limits to the operations of a railway company, and limits to the number of ports to which a steamship line can send their vessels, but upon the aerial train or liner these limits are imposed to a far less degree, and the applications of wireless are multiplied correspondingly.

THE ORGANISATION OF THE AIR ROUTE.

The modern air route is divided up into stages, at each stage being one of three classes of aerodrome:

- (a) Terminal aerodrome;
- (b) Intermediate aerodrome;
- (c) Emergency landing ground.

The two former are fully equipped aerodromes, are kept open in exactly the same manner as a railway station, and are equipped with wireless facilities; the latter maintains no wireless station. Emergency aerodromes are only used where it is necessary for an aircraft to land to effect repairs, which would prevent it from continuing its journey to a terminal or intermediate station, and which cannot be carried out in flight. They are the "sidings" of the airway.

* Of the Department of Communications, Air Ministry.

A sketch map of the existing terminal and intermediate aerodromes in the British Isles is shown in Fig. 1, all of which have their own wireless telegraphy and telephony stations. Details of these stations have already been published in a Paper read by the writer before the Radio Society of Great Britain, on January 27th, 1921, under the heading "The Wireless Stations of the British Commercial Airways"; and although improvements have been effected on the technical side, yet, in the main, these stations remain the same to-day.

THE TERMINAL AERODROME.

The Croydon Aerodrome, London's Air Port, is the one terminal aerodrome as yet actually in existence in the British Isles; but there can be little doubt that any air port which may later be developed will be modelled along the lines of Croydon.

The whole aerodrome is under the control of a single official, who is known as the Civil Aviation Traffic Officer (C.A.T.O.). The scope of his responsibilities is considerable, in that he must be capable of performing the combined duties of Traffic Manager, Superintendent of the Line, and of Customs Officer and Immigration Officer if necessity arises; and he is responsible for the control and safety of an aircraft during the time that it is in the air, and this responsibility only ceases when it has left his area, or has landed.

Directly under the C.A.T.O. come the various officers concerned with the different duties of the air port, Traffic Stores, Meteorological, Accounts, Navigation and Wireless, the latter named being responsible for the efficiency of the aerodrome Wireless Station and its staff, and advising, if necessary, upon points relating to wireless in the aircraft of the different companies. His is the controlling station of the whole air route system of wireless, and he therefore needs to exercise the greatest possible amount of care and tact in getting the best out of his subordinate stations and of the operators in the air. His is the task of maintaining a good liaison between those wireless men who fly daily, and those, whose duty is perhaps equally wearing and responsible, who keep a close watch on the aircraft and guide them in safety on their way.

Each aviation company has an office situated upon the aerodrome itself, apart from any other which it may have in the metropolis, and this office is supplied with a telephone connected to the aerodrome exchange. In this way the company's representative is able to speak direct to any point within the airport, or to any ordinary telephone subscriber outside. Three British companies are subsidised by the Government at the present time, and guarantee regular services to the Continent. Messrs. Handley-Page operate the London-Paris airway; Daimler Airways provide the service London-Amsterdam-Berlin, with an extension to Manchester, and an ultimate extension in prospect to Hamburg and Berlin, and Messrs. Instone's machines travel daily from London to Brussels, with an extension to Cologne, where their service will undoubtedly in due course link up with the German system. This means that unnecessary competition between the British firms is avoided, and each journey is carried out in the most economical manner possible.

A Trust House hotel is also situated at Croydon for the benefit of passengers delayed or wishing to break their journey; and a service of cars operated by the companies, conveys the passengers, their luggage and any merchandise or goods to and from the air port. A post office, bookstall, porters, interpreters and messengers are available, and in every way the terminal aerodrome forms the counterpart of the big continental railway terminus. The large hangars, wherein are housed the air liners and air taxis form an increasingly popular source of interest to a good many Londoners. It would seem that the older generation of schoolboy, whose leisure moments

were frequently spent sitting by the side of the railway noting carefully the numbers of the passing locomotives, is now almost replaced by a newer type whose greatest ambition is apparently to differentiate between the many classes of aircraft constantly arriving and departing. It is truly a sign of the times.

THE INTERMEDIATE AERODROME.

The best existing example of this type of air station is at Lympne, near Folkestone, where a facsimile of the organisation at Croydon is reproduced. As comparatively few through air expresses land at Lympne, the necessity for general accommodation on so large a scale does not arise, but there are Customs and Immigration Offices working under the C.A.T.O., and a route radio telephone station in direct communication with Croydon and St. Inglevert, near Calais. Such regular aircraft as those employed on the Ostend newspaper service, however, operate from Lympne, so that the station is a busy one. The work of the wireless station is, for the most part, that of communicating with the various aircraft in flight, informing their pilots of weather conditions along the route, passing them information concerning their passengers and freight, and frequently acting as a relay station from Croydon to them.

TRAFFIC CONTROL.

In order to reserve entirely the attention of the terminal and intermediate route wireless stations to aircraft in flight, every station and every aeroplane instrument, both transmitting and receiving, is adjusted to the "aircraft wave." In precisely the same manner that the 600 metre wavelength is reserved for shipping of the mercantile marine, so the wavelength of 900 metres is set aside for mercantile aircraft, and other stations are not allowed to radiate signals of any kind on that wave. Aircraft move very rapidly in comparison with other modes of transport and their communications must therefore be of a nature essentially rapid and brief. In the case of a ship a delay of a minute or two would cause no serious inconvenience in establishing communication and in passing a message. The aeroplane, during the same period of time, may have changed its position by perhaps two to three miles, a fact fraught with serious consequences should it be travelling under adverse weather and flying conditions. With this point in view radio telephony was introduced, worked up from what was purely a very experimental condition and finally established as one of the chief factors of safety in aerial navigation. The history of its early struggle for development forms interesting reading matter, and can only be appreciated after seeing the results of those earlier efforts in to-day's aircraft telephone sets, and after hearing the conversations between pilots and operators in aircraft with people on the ground.

The route stations maintain a constant watch for aircraft during flying hours, and a quick method of changing over from reception to transmission enables them to reply immediately to any call they may receive. It is a matter of extreme rarity for an aircraft to call one of the ground stations and not obtain an answer at once, unless, of course, the particular station is already engaged with another machine. The converse is also true. With an experience of civil flying, in some cases extending to four years, the aircraft personnel are showing a promptness in answering calls from the ground stations which augurs well for the future of the Services, and should constantly tend to improve the faith of the public in the vast possibilities which aerial travel has opened up. Already there are such signs shown by a decrease of insurance premiums on aircraft and attendant matters.

The wireless control of all commercial aircraft operating on air routes terminating at the London Aerodrome is centred at Croydon, and is the responsibility of the "Traffic Controller," who is constantly to be found in the control tower during flying hours. This control tower in some respects resembles the railroad signal box, and consists of an elevated platform with glass sides, the whole forming a small room which it is possible to see readily over the aerodrome. A smaller room overhead contains certain necessary

instruments. Round the walls of the lower room are situated the various indicators and switches for ascertaining the force and direction of the wind, and for controlling landing lights, together with a gnomonic chart of the areas within wireless range of Croydon, for direction finding purposes. The control tower is the nerve centre of the whole aerodrome, and is the brain of the airway.

The traffic controller is accompanied by a wireless telephone operator whose duty it is to maintain communication with the various aircraft as desired, and to pass instructions to and receive reports from them. A direct telephone line from the operator's table runs to the wireless exchange board in the wireless station, so that the controller's operator is enabled to speak at once to any particular machine without having his attention distracted in manipulating the instruments.

A second operator controls the whole of the running of the power units, transmitter circuits and D.F. receiver, but is not concerned in regulating the traffic. There is, therefore, very little likelihood of any mistake arising due to an operator not being able to concentrate his attention on the work before him. The whole system, further, is duplicated, and should a breakdown occur the station can immediately be brought into action by the emergency sets.

It is possible for the offices of the aircraft companies also to be switched through the wireless station so that they can speak direct to their pilots while flying. It is only on the rarest occasions that this is permitted at the present time however, as if carried out as a regular part of the daily programme it would result in very unnecessary interference to the more important work of control. There is but little doubt, on the other hand, that in the fullness of time, and with the constant improvements which are being steadily added month by month, such "line switching" will one day form a normal feature in air line signalling. But a great deal more research work has yet to be done towards making radio telephony more private and less liable to mutual interference. Carrier waves, generator noises, "wipe-outs," will have to be annihilated. A trustworthy duplex system must be evolved enabling instantaneous two-way speaking and permitting of one speaker interrupting the other. All telephony transmissions will have to be made as highly selective as C.W., unless radio-telephony is to become as troublesome as the now moribund spark systems. These are the immediate problems confronting us.

Apart from the ordinary traffic routine all direction and position finding work is carried out on the 900 metre wavelength. The Croydon station is equipped with an up-to-date Marconi D.F. receiver, modelled on the Bellini-Tosi design, and after some three years of continual experience as the first station of its kind, is capable of giving bearings with a considerably high degree of accuracy. Working by itself it is able to give a bearing to an aircraft immediately upon receiving the request, which is due to the fact that all reception is performed through the D.F. circuits. This has the additional advantage that, in times when several machines are working together, the search coil unit can be used as an extra method of avoiding interference, by the simple expedient of eliminating all but the one machine with which it is desired to communicate. Providing atmospheric conditions are not abnormal, the time taken between the demand for a bearing being made and its receipt by the pilot or navigator, averages less than two minutes. Single bearings are invaluable in guiding a machine to the aerodrome during the last fifty miles. All bearings given are true bearings reckoned from North 000° or 360° , so that the bearing of an aeroplane situated to the East would be 90° , or to the West 270° . By a simple arithmetical process, then, all that a pilot requires to do to reach Croydon is to fly by compass on the reciprocal of the bearing given him, making due allowance for magnetic variation, compass deviation, and the effect of the wind on the direction in which his machine is travelling. With little practice this process of correction becomes almost automatic.

It is not always advantageous for aircraft to navigate solely by single bearings, which give *direction* only, and it adds very greatly to the confidence of everyone concerned if, from time to time, the exact *position* of the different machines is known. The arrangement becomes more popular still if the whereabouts of the aircraft is known at any given minute. Aeroplanes, unlike trains, have no hard and fast route to run on, and the landmarks by which a pilot can recognise his position in fine weather, become invisible when he flies into clouds or fog; and he may very easily lose all idea of his location after a short time. It thus becomes necessary to develop a system by which his position can be determined and given him from the ground.

The term "position finding" as distinct from "direction finding" came to be employed gradually as this process of giving an aircraft its position in distinction to its bearing was evolved. The system necessitated the simultaneous obtaining of bearings by a second station and a rapid comparison of both results on a chart at the main station. After the cessation of activities in airship circles in the late summer of 1921, the Air Ministry's second Civil D.F. station became available for position finding work in conjunction with Croydon. A six months' trial followed, was completely successful, and in May, 1922, the system was adopted as a matter of normal routine. There remains to be seen the value of the subsequent summer's experience, when civil pilots have had the opportunity of flying in fairly good weather conditions, in increasing the reliability and safety of flying during the winter months. Suffice it to be remarked in passing that already one pilot has navigated his machine in fog and mist, the entire distance between Le Bourget (Paris) and Croydon, being out of sight of the ground the whole way, with no other assistance than D.F., and that instances have occurred where lost aircraft have been safely guided to their destination by this method. The appropriate routine and method of procedure is shown elsewhere in the Aircraft Section.

TRAFFIC SIGNALLING.

The reservation of the aircraft wave for purely air to ground and ground to air purposes meant that at least one further wavelength would be needed for dealing with the other traffic signalling. There arose the problem of notifying the arrivals and departures of machines, of passing any instructions to the various terminal airports concerning them, and of handling generally any situation that might from time to time arise and which could not be dealt with on the 900 metre service.

All such messages, relative to the conduct of the air route, became classified together under the heading of Route Traffic messages, and were given the wavelength of 1,400 metres. This wavelength is now commonly known as the Civil Aviation Wave, and on it is carried out every type of terminal point to point signalling. The sending of private telegrams between individuals is, of course, not permitted, but messages relating to official matters or relating to aircraft of the authorised operating air companies are accepted. The Air Ministry Wireless Station, situated in Kingsway, has the sole responsibility for dealing with traffic on this wave. A direct telephone line has been installed between the London Terminal Aerodrome at Croydon and the Air Ministry, and is reserved entirely for civil route traffic signalling. Messages handed in to the appropriate office at Croydon are passed over this line to London where they are checked, and then transmitted direct to the British or Continental addressee. At the moment the Continental Air ports are Le Bourget, Paris; Evere, Brussels; Schipol, Amsterdam; and Cologne. A new one will be in operation in the near future, Guernsey. A similar system of operation at each of these stations is in force, thus ensuring absolute freedom for aircraft to communicate with ground stations abroad as well as at home. At present the airways of Europe are but in the melting pot, but there is bound to emerge at no very distant future

date a series of definitely recognised routes which will all link up together with the existing pioneer routes, and will enable anyone to buy a through ticket to almost anywhere, just as now one takes out a ticket for travel by land or sea. The experience being gained to-day in wireless traffic control and signalling will then prove invaluable.

Messages, relating to traffic, as at present accepted, contain but the barest information concerning the type of machine, its international registration marking, its airport of destination, the time of its departure, the number of passengers, the quantity of merchandise or mail, in the order given, and the time of its departure, in the order given; and it is doubtful whether this form would be improved by alteration or expansion. Brevity stands for increased rapidity. Rapidity is the soul of the air route.

Information current on the 1,400 metre wave for continental air ports and valid for Lympne is passed to that station by a second direct telephone line, thereby obviating the need of a 1,400 metre watch being kept there, and also freeing the wireless system of unnecessary repetitions which might easily hold up important transmissions. On a normal day, especially during the holiday months, route traffic signalling is extremely heavy, and it is very essential to get messages through as expeditiously as possible, since a single delay might, if allowed, disorganise the whole system. Some thousands of words are dealt with daily, and, as a consequence, all unnecessary traffic must be ruthlessly cut out. The same might be said to apply to any signalling service, of course, but on the airway the need is many times greater than anywhere else.

WEATHER SIGNALLING.

Soon after the Armistice, and when the London-Paris route was first being organised, the 1,400 metre wave also carried the meteorological traffic. It will be seen that weather conditions may arise along the airway which render it imperative to divert or to stop traffic altogether. This is the duty of the Controller, but to carry out that duty he must be in full possession of all the weather facts along the routes for which he is responsible. With the increase of traffic came, as a natural sequence of events, an increase of route traffic signalling and a consequent crowding of the 1,400 metre service. An additional wavelength of 1,680 metres was then allocated for air route weather messages. Again, a steady organisation of the method of transmission of these weather telegrams became essential, and at the International Conference the decision was arrived at to consolidate weather reports along the routes for the different points, and to transmit these hourly broadcast. This practice is now carried out at scheduled times every hour by the Air Ministry and by the corresponding foreign stations, and the telegrams are known as Hourly Route Weather Messages. Forecasts are added at the end of such messages giving probable weather conditions for the ensuing hour. These signals are intercepted at the intermediate aerodromes, and are available upon demand for transmission to the pilots of passing aircraft by radio telephony in either an abbreviated or a full form for any portion of the route. These hourly reports and forecasts on 1,680 metres are naturally distinct from the General Synoptic Reports and Inferences which are issued on high power by the Air Ministry Station on 4,100 metres at certain defined periods during the 24 hours, which cover the whole area of the British Isles and forecast weather conditions generally, and by areas, more extensively, and have a much wider application.

ROUTE RECOGNITION MARKINGS.

Every aerodrome has clearly marked out upon it at some convenient spot its name, in large, white letters, clearly visible from a reasonable height or angle. Many of the more important points along the route are also marked in a similar manner. Ashford railway station being an example; and several points off the route are marked as signposts for any pilot who may be uncertain of his route.

For night flying, when these ground signs would be invisible, a series of lighthouses has been installed which function automatically. With nightfall the lighthouses, of their own accord, come into operation with light-signals of varying characteristics for the different localities. With daybreak they automatically extinguish themselves. This system needs attention but twice yearly, and has the important additional value that, should the daylight at any time fall below a pre-determined intensity value, the lighthouse at once comes into action. In very dull or foggy weather, therefore, the lighthouses are always to be found working.

An extensive scheme of "landing lights," for incoming aircraft at night time, is in use at Croydon, being the first of its kind. The whole system is electrically controlled from the control tower, and enables a pilot to perform what would otherwise be a hazardous undertaking with the same degree of accuracy and safety as in broad daylight.

THE FUTURE.

Looking to the future there are things that occur to one's mind as at least possibilities. The immediate necessities in the direction of radiotelephony have been outlined. It must become more and more of the nature of the existing landline telephony, giving immediate two-way working; and its existing capabilities in the direction of causing interference will have to be eliminated. If such prove not to be within the realms of possibility, then, within a comparatively short space of time, when air traffic, carrying wireless, shall have expanded to a somewhat larger scale than that upon which it exists at present, we shall have achieved the limit to the number of aircraft which it is possible to have in the air at once. That is, as far as wireless telephony is concerned, with its existing allotment of one wavelength.

A second, and perhaps equally important matter, and one in which, no doubt, wireless circuits will play a leading part, is that of landing aircraft at any hour of the day or night under any circumstances. It is one thing to bring the aeroplane over the air station by directional wireless, but it is another affair entirely to get that aeroplane into the aerodrome without further aids to skill and good judgment on the part of the pilot. A tremendous service would be rendered to aviation could an instrument for landing an aircraft be devised. That device should be brought into effect from the time D.F. has navigated the machine over the aerodrome until it is safely landed. Several appliances with this object directly or indirectly in view have been unsuccessful, and the field is still open. It is neither necessary nor desirable to crowd into any aircraft large numbers of instruments, but one instrument, capable of putting the aircraft on to the surface of the ground in safety, even in the event of the pilot being taken ill, would be, to say the least, highly valuable. In the meanwhile a method of landing an aircraft in fog, by means of a combination of the principles of sound location and radiotelephony, is being experimentally attempted. A large trumpet capable of being rapidly revolved, and directly accessible from the control tower, picks up the noise of the aircraft's engine and indicates its direction. Simultaneously, by means of low power radio telephony, the traffic officer obtains communication with the pilot of the aircraft, and instructs him to fly to any desired position, meanwhile checking his movements by the sound locator. Having thus manoeuvred the machine into the proper locality for landing, the traffic officer switches on his landing lights.

The questions of increasing the capabilities of aircraft sets, and at the same time decreasing their weight, is one which is receiving the constant attention of many designers; and the rendering of such sets more and more fool-proof and simpler of manipulation becomes a matter of daily routine. The remark that the greater the simplicity the type of the domestic broadcast receiver the larger the liability towards good results

and hence the greater the popular faith in it, is not without its application to the wireless instrument of the commercial aeroplane. There is neither the space nor the time, in any existing type of aircraft, for a complex instrument. The reason why the pilot in many instances is also his own wireless operator is at the moment purely one of safety. In the comparatively small crew spaces available in modern machines there is often hardly suitable spare room for an operator, and neither are there the facilities for immediate intercommunication between pilot and operator. The time is approaching, however, when the advent of larger aircraft will abolish these drawbacks, and doubtless in the huge passenger air liners of the future, long range wireless, with D.F., will be carried, and the routine will be the same as on the present day ocean going liner. For long range purposes, too, wireless telephony will most likely disappear, leaving only telegraphy as being more accurate and less liable to give rise to misunderstandings with any consequent wastage of time; but the organisation adopted for radiotelephony with terminal airports and large intermediate aerodromes looks as if it has come to stay.

Nothing has been mentioned in this article of airships as a commercial possibility. At present they are very much of an unknown quantity, and perhaps, until further experiments and trials are completed, it would be unwise to attempt to forecast their future. Should they ever take to the air again, by reason of their large carrying capacity and ability for long range cruising, they will open up additional possibilities for the aircraft wireless engineer.

And with a steady return to normal conditions and a general easing in the present financial stringency, it will be interesting to see how far these, and many other similar problems, are met and conquered.

B.—REGULATIONS & PROCEDURE —GENERAL.

I.—RADIOTELEPHONY: ORGANISATION AND PROCEDURE.

SECTION I.—GENERAL REMARKS.

1. Radiotelephony equipment in aircraft, operated in conjunction with the system of ground stations, affords an efficient means of controlling air traffic. It enables pilots to report progress *en route*, to obtain meteorological information for any point of their journey, to obtain navigational aid when flying at night or in adverse weather conditions, and, in cases of distress, is an important factor in obtaining assistance. It has the additional utility of enabling inter-communication between aircraft in flight to be effected.

2. The possession of a Postmaster-General's Certificate for Wireless Telegraphy is not necessary to operate radiotelephony installations, but pilots or others using the apparatus must hold the provisional certificate for radiotelephonists issued by the Postmaster-General.

3. Conversation by radiotelephony must be as brief as possible, and for this reason it is desirable that pilots, before leaving the ground, should be in possession of the latest information available at the time of departure. The precaution of "listening-in" must be taken by every aircraft operator prior to making an initial call, in order to ensure that the station called is not already working.

SECTION II.—ORGANISATION.

1. *R/T Ground Stations.*—The radiotelephony stations available for aircraft communication, classified by their respective countries, are shown in Part III of this Notice.

2. *Language.*—When working with continental R/T stations, the language used should be that employed by the ground station worked.

3. *Scope of British Stations.*—The London Terminal Aerodrome station will maintain communication with aircraft as far as the French coast, the Lympne station standing by to relay and assist as and when necessary.

4. *Wavelength.*—The international wave band allocated exclusively for aircraft communication by either radiotelephony or radiotelegraphy is 850-950 metres. The normal wave at present used for such communication is 900 metres. Under certain circumstances, as hereafter shown, the wavelength of 600 metres may be used by aircraft for the transmission of distress signals.

5. *Call Signs.*—The R/T call sign of a ground station is the name of that station, while the international registration mark of an aircraft is also its W/T or R/T call sign. In R/T work, the call sign of an aircraft will always be preceded by the name of the company by which it is operated.

6. *Emergency General Call Signs.*—In cases of emergency, commercial aircraft may call the nearest R.A.F. or Air Ministry civil aviation ground W/T station by using the call sign GEZ (any R.A.F. or Air Ministry civil aviation ground W/T station), and similarly any commercial ground station wishing to communicate with

R.A.F. aircraft can do so by making use of the general call sign GEA (any R.A.F. aircraft). The W/T procedure to be used by commercial aircraft in this connection is shown in the subsection on Procedure. Equivalent call signs have been allocated by the French air authorities as shown:—

FNA .. Any French aircraft.
FNZ .. Any French ground W/T station.

SECTION III.—NATURE OF COMMUNICATIONS.

Communication is confined to matter strictly relative to the control and safety of aircraft, and in this connection the deciding authority regarding the transmission of any message not covered under any of the following headings, is the civil aviation traffic officer. Communication can be classified under the following headings:—

1. *Distress Calls.*—Pending the results of tests now being conducted to determine an international distress word for R/T purposes, a spoken phrase—S.O.S.—will be used as the distress signal, and its use will ensure immediate attention by all stations receiving it. A pilot making a forced landing at sea, when in communication with aircraft R/T ground stations, should make the call three times on the 900 metres wave, followed by as much information (concerning locality, nature of distress, etc.) as time allows. Upon receipt of the distress call the direction finding stations, situated at Croydon and Pulham, will at once take bearing of the aircraft concerned and will report the results to the traffic officer at Croydon, who will take all necessary steps to render immediate assistance, according to the pre-arranged scheme for such occurrences. During the time that Croydon and Pulham are taking such bearings, Lympne will concentrate on getting the whole message, it being observed that Croydon's primary object is to obtain a reliable bearing, an action which may involve the non-reception of portions of the signal.

NOTE.—In the case of an aircraft making a forced landing at sea when employed on special flights which take it out of range of aircraft ground R/T stations, the distress call, S.O.S., should be made on the 600 metres wave, the general ship distress wave. In this case the call should preferably be made on "interrupted continuous wave" transmission by Morse; but if no skilled telegraphist is carried the call may be made on the 600 metres wave by R/T.

2. *Navigational Aids.*—Aircraft in need of navigational assistance can obtain the following aids:—

(a) A position as plotted by bearings taken by two D/F stations.

(b) A bearing of the aircraft taken from a single D/F station.

Full details of the radiotelephony routine for the D/F service are given in the D.F. subsection.

3. *Position Reports.*—Incoming or outgoing aircraft on the continental airways will report when at the following places:—

Biggin Hill.
Tonbridge.
English Coast.
French Coast.

When leaving either coast, aircraft will announce the *intended point of their arrival on the opposite coast.*

4. *Weather Reports.*—

(a) Weather reports giving the latest information from stations on the cross-Channel air routes are available for communication to pilots of machines in flight, upon demand, and are drawn up in the following form:—

Time of Observation.	Place.	General Weather and Warnings.	Visibility.	Height of Lowest Cloud (feet).

(b) Places for which information is available are Biggin Hill, Lympne, Beachy Head, St. Ingelvert, Abbeville, Beauvais, Compiègne, Le Bourget, Brussels, Ostend, Flushing, Rotterdam and Schiphol. Under certain bad weather conditions, reports for Grain, Deal and North Foreland, will be added.

(c) Pilots asking for "weather report for that place." will be given the whole information for that place. The R/T operator in replying will follow the set order and will not read out the headings. To avoid confusion between visibility and cloud height, it should be noted that distance of visibility is always given in yards or miles and that height of lowest cloud is always given in feet. On the other hand, should the pilot ask for "Croydon visibility," the reply would be in the form "0800 Croydon 4,000 yards."

(d) In addition to the above-mentioned items, information relating to wind at various heights and places will also be available, but, as a rule, a delay of a few minutes will be necessary whilst such data, if requested, are being prepared.

5. *Report of Adverse Weather.*—Pilots *en route* encountering adverse weather conditions, of which no mention is made in the latest weather report, should transmit appropriate information to the nearest ground station for the benefit of other aircraft operating over the same route.

SECTION IV.—PROCEDURE.

1. The procedure herein laid down is applicable to both ground stations and aircraft. It has been compiled in the light of experience and legislates for air traffic on an average flying day.

It is essential that the correct procedure be adhered to by all concerned at all times, for, although irregularities may possibly cause no apparent delay or disorganisation when only one aircraft is flying, such irregularities will cause serious consequences when several aircraft are communicating. The Croydon R/T station is the controlling station for all R/T work on 900 metres wave within the British Isles, and, as such, its orders must be obeyed.

2. In the following paragraphs are shown examples of R/T communication between Croydon station and an aircraft belonging to the fictitious company, "Continental Airways, Ltd.," and flying from London to Paris. These examples give the correct procedure respecting all subjects upon which communication is necessary, with the exception of direction finding procedure, which is dealt with fully in the D.F. sub-section.

3. *Procedure on Leaving the Aerodrome.*—The aircraft on leaving the aerodrome calls the ground station and passes a message (see paragraph 4) giving its registration marking, its aerodrome of departure, and its destination.

(a) *Calling up.*

"Hullo Croydon, Hullo Croydon, Continental GEXYZ calling, Continental GEXYZ calling, over."

When re-making an initial call, the call signs of both the station called and of the station calling are made twice. Communication once having been established, call signs are transmitted once only.

(b) *Answering.*

The ground station replies:—

"Hullo Continental GEXYZ, Hullo Continental GEXYZ, Croydon answering, Croydon answering, over."

4. *Passing a Message.*

The aircraft continues:—

"Hullo Croydon, Continental GEXYZ calling, London to Paris, Continental GEXYZ, London to Paris, over."

The ground station replies:—

"Hullo Continental GEXYZ, Croydon answering, understand you are bound for Paris, understand you are bound for Paris, is that correct? over."

To which the aircraft answers:—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

This signal and its acknowledgment by the ground station afford a test of the machine's R/T apparatus, and enable the aircraft to tune its receiver and obtain all necessary adjustments.

NOTE (i). Messages in every case are transmitted twice, repeated by the receiving station, and confirmed by the sending station.

NOTE (ii). During communication the word "over" terminates each transmission. The words "switching off" indicate that communication is finished.

5. *Position Report.*—The aircraft, upon reaching Biggin Hill (a reporting point):—

"Hullo Croydon, Continental GEXYZ calling, passing Biggin Hill, passing Biggin Hill, over."

Croydon answers:—

"Hullo Continental GEXYZ, Croydon answering, understand you are passing Biggin Hill, understand you are passing Biggin Hill, is that correct? over."

To which the aircraft answers:—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

The machine proceeds to Tonbridge, the next reporting point, where a similar message to the above is passed.

6. *Request for Weather Report.*—The weather being unsettled the pilot may desire information regarding conditions on the French coast, prior to crossing the Channel. The request is made thus :—

"Hullo Croydon, Continental GEXYZ calling, give me weather report for French coast, give me weather report for French coast, over."

The operator at Croydon thereupon transmits the most recent report for St. Inglevert :—

"Hullo Continental GEXYZ, Croydon answering, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, over."

This is received, duly acknowledged by the aircraft, and confirmed by the ground station.

7. *Report on Leaving Coast.*—The pilot of GEXYZ, considering the report satisfactory, leaves the English coast, reporting thus :—

"Hullo Croydon, Continental GEXYZ calling, now leaving Dover for Gris-Nez, now leaving Dover for Gris-Nez, over."

Croydon repeats message correctly, and the aircraft operator confirms it.

8. *Report of Adverse Weather.* In Mid-Channel adverse weather conditions are encountered and reported by the pilot in the following manner :—

"Hullo Croydon, Continental GEXYZ calling, clouds down to 200 feet in Channe, heavy rain squalls, clouds down to 200 feet in Channel, heavy rain squalls, over."

On receipt of this signal the operator at Croydon at once notifies the Meteorological Office there.

9. *Report on reaching French Coast.*—The pilot, on reaching the French coast, again reports position, and here the R/T work of the British stations ceases nominally, the French stations thereafter taking over control.

10. *Example of Distress Call.*—The following is an example of the procedure to be adopted in making a distress call by R/T on the 900 metres aircraft wave :—

SOS, SOS, SOS, continental GEXYZ, engine trouble, about 5 miles north of Gris-Nez, SOS, SOS, etc."

This signal is made as frequently as time allows, and should give as much information as possible regarding nature of distress, position, etc. All ground stations and aircraft hearing this call immediately cease any R/T work upon which they may be engaged, and concentrate upon receiving the full message from the distressed aircraft. The Croydon and Pulham D/F stations plot the machine's position, and report it to the Croydon traffic officer, who takes all steps with the necessary authorities to render assistance according to the pre-arranged scheme.

11. *Failure to Receive.*—Failure to receive acknowledgements should not deter an aircraft from transmitting. For instance, an aircraft may develop a fault in its wireless receiver, in which case it should not fail to continue reporting its positions at the points along the route laid down above. At the same time great care must be taken to avoid unnecessary transmission.

12. *Phonetic Alphabet.*—The following phonetic alphabet is used by Government civil aviation stations :—

A = Ac.	N = Nuts.
B = Beer.	O = Orange.
C = Charlie.	P = Pip.
D = Don.	Q = Queen.
E = Edward.	R = Robert.
F = Freddie.	S = Sugar.
G = George.	T = Toc.
H = Harry.	U = Uncle.
I = Ink.	V = Vic.
J = Johnnie.	W = William.
K = King.	X = X-ray.
L = London.	Y = Yorker.
M = Monkey.	Z = Zebra.

This alphabet should be used whenever it may become necessary to have recourse to spelling word during radiotelephonic conversations.

C.—REGULATIONS & PROCEDURE— DIRECTION FINDING.

II.—WIRELESS DIRECTION FINDING SERVICES : BRITISH ISLES, FRANCE, GERMANY AND ITALY.

GENERAL REMARKS.

1. Since, in giving an aircraft a bearing, reference is made to the time at which the readings are taken, it is essential that the aircraft's watch should be absolutely accurate. If there is any doubt as to the accuracy of the watch, a check should be at once carried out by calling the nearest route ground station, and obtaining the exact time (G.M.T. or B.S.T., as the case may be).

2. In order to avoid unnecessary interference and any consequent confusion or delay, an aircraft operator must invariably "listen in" before calling a station, to ensure that that station is not already engaged.

3. The D/F stations available for use by aircraft and the procedure to be employed are grouped by countries hereunder.

SECTION I.—BRITISH ISLES.

(a) Stations.

See also Directory Section—Land.

Croydon	.. Aircraft only.
Pulham	.. Aircraft only.
Berwick	..
Flamborough	.. 20 ¹ / ₂ , 310 yds. from Flam- borough Head Lighthouse.
Lizard	..

(b) Telephony Procedure.

(i) *In conjunction with Croydon and Pulham.*—The procedure, when using R/T, for an aircraft desiring to obtain its position by means of cross bearings from Croydon and Pulham, is as follows :—

Example.

Aircraft GEXYZ belonging to "Continental Airways, Ltd.," wishes to ascertain its position.
1st Action.

Aircraft calls Croydon and asks for its position :—

"Hullo Croydon, Continental, GEXYZ calling, position required, position required, over."

2nd Action.

Croydon replies :—

"Hullo Continental, GEXYZ, Croydon answering, Righto, Righto, please speak now for half a minute."

(In the event of other aircraft talking Croydon will order them to cease work until called, and THEY SHOULD IMMEDIATELY DO SO.) The reply "Righto" means that the stations are ready to take the bearings.

3rd Action.

The aircraft operator then speaks for half a minute, remembering that Croydon is paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Pulham takes a bearing and passes it to Croydon.

5th Action.

Croydon takes a bearing, plots the position of the aircraft in conjunction with Pulham's bearing, and continues :—

"Hullo Continental GEXYZ, Croydon calling, at 1509 position 2 miles north of Canterbury, at 1509 position 2 miles north of Canterbury, over."

6th Action.

Aircraft replies :—

"Hullo Croydon, Continental GEXYZ answering, at 1509 position 2 miles north of Canterbury, at 1509 position 2 miles north of Canterbury, GEXYZ over."

7th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, position correct, position correct, switching off."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate direct with an aircraft when it is flying north of London and is out of range of Croydon.

(ii) *In conjunction with either Croydon or Pulham only.*—The procedure, when using R/T, for an aircraft desiring to obtain a single bearing from Croydon or Pulham is as follows :—

Example.

Aircraft GEXYZ wishes to obtain a bearing from Croydon.

1st Action.

Aircraft GEXYZ calls Croydon and asks for its bearing :—

"Hullo Croydon, Continental GEXYZ calling, bearing required, bearing required, over."

2nd Action.

Unless Croydon has already obtained a satisfactory bearing that station replies :—

"Hullo Continental GEXYZ, Croydon answering, Righto, Righto, please speak for half a minute, over."

3rd Action.

The aircraft then speaks for half a minute, remembering that Croydon is paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, bearing 110 degrees at 1509, bearing 110 degrees at 1509, over."

5th Action.

The aeroplane replies :—

"Hullo Croydon, Continental GEXYZ answering, got bearing 110 degrees at 1509, GEXYZ, got bearing 110 degrees at 1509, over."

6th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, bearing correct, bearing correct, switching off."

(c) Morse Procedure.

(i) The following abbreviations are to be used :—

Signal	Meaning.
QTE ?	"What is my true bearing from you (or from) ?"
QTE	"Your true bearing from me (or from) was..... degrees."
QTF ?	"What is my position determined by cross bearings from..... ?"
QTF	"Your position determined by cross-bearings from..... is....."
QSY ?	"Shall I transmit with a wavelength of..... metres ?"
QSY	"Change over to wavelength of..... metres."

(ii) *In conjunction with Croydon and Pulham.*

Example.

An aircraft GEXYZ using Morse procedure requires to ascertain its position as determined by cross bearings from Croydon and Pulham.

1st Action.

The aircraft calls Croydon :—

"CT GED GED GED de GEXYZ
GEXYZ GEXYZ QTF UD QTF UD AR."

2nd Action.

Croydon communicates with Pulham, and when the latter station is ready, makes to the aircraft :—

"CT GEXYZ de GED K."

3rd Action.

On receipt of "K" the aircraft then makes :—

"CT GED de GEXYZ GEXYZ, etc.
(for 30 seconds)....GEXYZ."

4th Action.

During this transmission Pulham takes a bearing and calls Croydon :—

"CT GED de GEP QTE GEXYZ 182 at
1509 AR."

5th Action.

Croydon determines the position of the aircraft with her own and Pulham's bearing, and replies to the aircraft :—

"CT GEXYZ de GED QTF 2 miles north
of Canterbury at 1509 AR."

6th Action.

In order to confirm to Croydon that the aircraft has received the position correctly, she will repeat it back to Croydon:—

"CT GED de GEXYZ QTF 2 miles north of Canterbury at 1509 AR."

7th Action.

If the aircraft has received the position correctly Croydon will acknowledge, making the "end of work sign":—

"CT GEXYZ de GED R VA."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate with an aircraft direct when it is flying north of London and is out of range of Croydon.

The procedure for obtaining a single bearing from one station only is similar to that outlined in the 1st Action of the above example, except that QTF is replaced by QTE.

(iii) In conjunction with other Ground Stations.

In the case of the other ground stations, if cross bearings are required to determine an aircraft's position, the stations should be called up together and the bearings taken in one operation. The aircraft calls the station or stations on the appropriate wave, making "QTE?" in conjunction with the call signals of the stations from which bearings are required. The station or stations called, when ready, answer in alphabetical order of their call signs, and make "K" ("go on").

Example.

An aircraft, whose call sign is GEXYZ, required a bearing from Berwick (BVG) and Flamborough (BVN).

1st Action.

The aircraft makes on 450 metres:—

"CT BVG BVG BVN BVN de GEXYZ GEXYZ QTE UD AR."

2nd Action.

On receiving "K" from each station, the aircraft makes her own call signal for 60 seconds, and awaits the result.

3rd Action.

The stations reply (in alphabetical order of call signs) either asking the aircraft to repeat (UD) or giving the result. The result is given by the signal QTE, followed by the call signal of the D/F station, and by a group of three figures (000 to 359), indicating the true bearing from 000° to 359° of the aircraft from the station, reckoning clockwise from North (e.g. North = 000°, West = 270°). The result is given in the form:—

"CT GEXYZ GEXYZ de BVG 9.45 M (time) BT QTE BVG 092 AR."

followed by:—

"CT GEXYZ GEXYZ de BVN 9.45 M (time) BT QTE BVN 045 AR."

4th Action.

The aircraft, on receiving the result, acknowledges receipt in the ordinary way, repeating the bearing received from each station and makes VA ("end of work" sign). This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume normal watch.

NOTE.—The letter M or S, following the time in the bearing signal denotes that the time stated is A.M. or P.M. respectively.

(d) General.

It should be noted that R/T will not normally be used for D.F. purpose for communicating with stations other than Croydon and Pulham.

SECTION II.—FRANCE.

(a) Stations.

See also Directory Section—Land.

Bernieres ..	—
Berre ..	—
Bizerte ..	—
Brest-Moulin du Seigneur	Service temporarily suspended.
Casablanca D.F. (Morocco)	Replies through Casablanca (CNP).
Cherbourg ..	The D.F. station works in conjunction with the ordinary W.T. traffic station.
Gris-Nez ..	—
Kenitra (Morocco)	—
Lorient ..	—
Marseille ..	—
Ouessant-Pen ar Roch	Replies through Ouessant (FFV)
Penmarch ..	—
Pointe du Raz	—
St. Nazaire ..	—
Soubise (Rochefort)	—
Toulon-la-Mitre	—
Treguier St. Gonerly	—

(b) General.

French D/F stations of small power keep watch on the wavelength of 600 metres; this wave must be used in all cases by aircraft for calling French ground stations in order to obtain bearings.

The ground station called replies on the 600 metres wave. The wave upon which the bearing is given can be either 450 metres or 800 metres, at the choice of the aircraft, which choice should be indicated in making the first call. The wavelength of 600 metres can be similarly utilised by aircraft which are not able to transmit and receive on 450 metres or 800 metres.

The results of observations are transmitted by the ground station on whichever wave is chosen. It should be noted, however, that Toulon and Casablanca always transmit bearings on 800 metres, irrespective of the wavelength upon which the bearing is taken.

The charge in respect of each bearing sent out by a French D/F station is six francs. The charges will be collected in the same manner as for wireless telegrams originating from ships.

(c) Procedure.

(i) The procedure is similar to that laid down for British D/F stations. The abbreviations to be used are :—

QTE ? "What is my true bearing from you (or from.....) ?"

QTE "Your true bearing from me (or from.....) is....."

The bearings are indicated by a group of three figures from 000 to 359, reckoning clockwise from North (North = 000°, West = 270°).

The procedure is to be observed as follows :—

1st Action.

The aircraft calls the station, or stations, on 600 metres, and transmits the signal "QTE ?" followed by the call signs of all the stations from which it requires bearings, and giving the wavelength upon which it desires the bearings to be given. It then listens in on 600 metres

2nd Action.

The ground stations called prepare to take bearings and, when ready, reply in alphabetical orders of their call signs, instructing the aircraft, by the signal "K," to commence its transmission; the letter "K" is followed by a number giving the strength of the aircraft's signals as received by the ground station.

3rd Action.

On receiving the signal "K" the aircraft adjusts its transmitting gear to the wavelength chosen and transmits its call sign for 50 seconds. It then "listens in" on that wave.

4th Action.

The stations reply in alphabetical order of their call signs, either asking for the aircraft signal to be repeated, or giving the results of their observations by the signal "QTE" followed by a group of three figures indicating the bearing.

Example.

An aircraft GEXYZ requires bearings from Moulin du Seigneur (FEI) and Ouessant-Pen ar Roch (FEO). It desires to use the wavelength of 450 metres. The different operations will take place in the following order :—

1st Action.

GEXYZ calls the two stations on 600 metres :
"VE FEI FEI FEO FEO V GEXYZ
QTE ? FEI FEO 450 AR."

2nd Action.

GEXYZ having transmitted this signal listens on 600 metres.

3rd Action.

FEI replies on 600 metres :—

"VE GEXYZ V FEI 450 K6."

4th Action.

FEO replies on 600 metres :—

"VE GEXYZ V FEO 450 K7."

5th Action.

FEI and FEO adjust their instruments to 450 metres.

6th Action.

GEXYZ adjusts its transmitter to 450 metres and signals :—

"VE FEI FEO V GEXYZ GEXYZ
GEXYZ.....(for 50 seconds) AR."

7th Action.

GEXYZ having transmitted this signal listens on 450 metres.

(the two stations having made their observations have, say, obtained the following results at 1545 G.M.T. :—
FEI 330° FEO 093°.)

8th Action.

FEI thereupon signals on 450 metres :—

"VE GEXYZ V FEI I BT 1545 QTE
330 AR FEI."

9th Action.

GEXYZ having received this signal acknowledges receipt by transmitting :—

"VE FEI V GEXYZ R II VA."

10th Action.

FEO transmits on 450 metres :—

"VE GEXYZ V FEO 3 BT 1545 QTE
010 AR FEO."

11th Action.

GEXYZ having received this signal acknowledges receipt by sending :—

"VE FEO V GEXYZ R II VA."

12th Action.

The stations repeat VA, and then all resume their normal watch.

NOTE.—The numbers 1 and 3 having the sign BT represent the number of the record on the stations' registers. The number 1545 refers to the Civil Mean Time of the Meridian of Greenwich.

If one of the stations (FEO for example) desires repetition, not having obtained a correct observation on the first transmission, it makes the signal :—

"VE GEXYZ V FEO UD."

The aircraft then repeats the transmission of its call sign for a further 50 seconds, after which the remainder of the operation is as described above.

SECTION III.—GERMANY.

(a) Stations.

See also Directory Section—Land.

Borkum	..	—
List	..	—
Nordholz	..	—
Wilhelmshaven	Control Station.	

(b) Procedure.

The stations belong to the State Marine, and are available for public use only when not in use by the Navy.

An aircraft requiring bearings should call Wilhelmshaven W/T station on a damped wave of 600 metres. That station makes the necessary arrangements with the D/F stations, and communicates the bearings or the position ascertained in latitude and longitude to the aircraft concerned. The D/F stations correspond with aircraft of other countries only through Wilhelmshaven station.

Example (i).

1st Action.

The aircraft calls the control station on 600 metres, and having established communication makes :—

"CT KAN de GEXYZ BT QTE QSY
600 AR."

2nd Action.

The control station answers and tells the aircraft to wait :—

"CT GEXYZ de KAN VE AS."

3rd Action.

The control station calls the three D/F stations on another wave, and, when they are ready to take bearings, makes :—

"CT GEXYZ de KAN BT BITTE VV
GEBEN AR" ("Please send V's").

4th Action.

The aircraft then sends V's as requested :—

"CT KAN de GEXYZ BT V's (for 60
seconds) GEXYZ AR."

5th Action.

The control station collects the results on a different wave, and transmits them to the aircraft :—

"CT GEXYZ de KAN BT QTE 1018
(time) BT KBO 012 (bearing) BT KBQ
247 BT KAO 350 VE UD AR K."

6th Action.

If the aircraft has received the bearings, she replies :—

"CT KAN de GEXYZ VE VE AR VA."

7th Action.

The control station then makes :—

"CT GEXYZ de KAN VE VE VA."

NOTE.—In the event of the aircraft requiring a repetition of the bearings, UD will be substituted for VE in the 6th Action above.

Example (ii).

An aircraft (call sign GEXYZ) requiring to ascertain her position by means of bearings from the three stations, the following procedure is to be employed :—

With the exception that QTF is substituted for QTE, the procedure is as in the first four Actions of Example (i) above until the three stations have passed the bearings to KAN.

5th Action.

KAN then makes to GEXYZ :—

"CT GEXYZ de KAN BT QTF 1018
(Your position at 1018) IST.....
GRAD (is.....degrees.....)
MIN.....SEK NORD-BREITE.....
(mins.....secs.....north latitude).....
GRAD.....MIN.....SEK.....
OST-LANGE.....(degrees.....
minutes.....seconds.....cast
longitude) AR K."

6th Action (et seq).

The procedure is then as in the last two actions of Example (i) above.

NOTE.—Mid-European time is used, the hours and minutes being expressed in four figures from 0001 to 2359.

SECTION III.—ITALY.

(a) Station.

See also Directory Section—Land.

Murano

NOTE.—Bearings from this station are to be obtained by calling Carbonera (ICZ) on 600 metres, and are transmitted for Murano by Carbonera.

A charge of six francs is made for each bearing transmitted by an Italian W/T D/F station. The charges are collected in the same manner as for wireless telegrams originating from ships.

(b) Procedure.

The procedure is as follows :—

An aircraft whose call signal is GEXYZ wishes a bearing.

1st Action.

On a wave of 600 metres she will signal :—

"CT ICZ ICZ de GEXYZ QTE ?"

2nd Action.

Carbonera will answer :—

"CT GEXYZ de ICZ AS."

3rd Action.

Carbonera then wires Murano; when ready, Carbonera replies :—

"CT GEXYZ de ICZ K."

4th Action.

GEXYZ after 30 seconds signals :—

"CT ICZ de GEXYZ GEXYZ GEXYZ,
etc." for 45 seconds.

(If dissatisfied with the bearing, Murano through Carbonera, will ask the aircraft to repeat.

Carbonera signals :—

"CT GEXYZ de ICZ UD."

GEXYZ repeats the signal as given above.)

5th Action.

When satisfied with the bearing, which is assumed to be 170° at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the aircraft as follows :—

"CT GEXYZ de ICZ de IRM 9.45 M BT
QTE 170 AR ICZ."

6th Action.

GEXYZ acknowledges receipt :—

"CT ICZ de GEXYZ R VA."

D.—AVIATION STATIONS.

III.—WIRELESS TELEGRAPHY STATIONS IN OPERATION IN CONNECTION WITH CIVIL AIR ROUTES.

GENERAL REMARKS.

The information given in these tables relates only to stations, either situated actually upon aerodromes, or whose routine is directly concerned with flying operations and is primarily intended for aircraft.

Certain routine transmission by these stations are only carried out during that portion of the year when additional air services are being run owing to longer periods of daylight. Such transmissions are shown hereafter marked with an asterisk.

Details of those W/T stations whose meteorological routine is not primarily intended for aircraft, but which may indirectly have bearing

upon the operation of the air routes, are given in Meteorological Office Publication 252, which can be obtained from H.M. Stationery Office, or directly from the Meteorological Office, Air Ministry, price 2s. 6d.

The procedure to be adopted for W/T (Morse) communication between aircraft and the ground stations of the countries hereafter mentioned is as laid down in the "Handbook for Wireless Telegraph Operators of H.M. Postmaster-General" obtainable through any bookseller or from H.M. Stationery Office, price 6d.

Unless otherwise stated all stations use a C.W. system, and all times quoted are G.M.T.

SECTION I.—BRITISH ISLES.

SEE ALSO DIRECTORY SECTION—LAND STATIONS.

Station.	Wavelength in Metres.	Routine.
Air Ministry	900 1400 1680 4100†	<p><i>Wave calibration.</i></p> <p><i>Route Traffic Messages</i> with Le Bourget, Brussels, Amsterdam and Cologne as necessary.</p> <p><i>Hourly Route Meteor. Messages</i> are transmitted daily at 0335*, 0435*, 0535*, 0635*, 0735, 0835, 0935, 1035, 1135, 1235, 1335, 1435, 1535, 1635.</p> <p><i>Meteorological Synoptic Reports</i> are issued daily, broadcast at 0200, 0600, 0800, 1400, 1900.‡</p> <p><i>General Inferences</i> are issued daily at 0915, 2000.</p> <p><i>Consolidated European Synoptic Reports</i> are issued daily at 0850, 1450.</p> <p>In addition, the station makes a series of calibrated wave transmissions addressed to "CQ" daily as shown:—</p> <p>(1) At 0750, on 900 metres, a series of figures 1 (● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>(2) At 0745, on 1,400 metres, a series of figures 2 (● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>(3) At 0800, on 1,680 metres, a series of figures 3 (● ● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>Immediately following each 5-second dash, any necessary corrections will be transmitted as follows:—</p> <p><i>Indicating figure for the Wave (i.e., "1," "2") BT followed by a four-figure group indicating the actual wave transmitted.</i></p> <p>If no correction is necessary VA will be made after each 5-second dash.</p> <p><i>Radiotelephonic communication with aircraft in flight.</i></p> <p><i>Route Meteor. Messages</i> to Air Ministry at 0802, 0902, 1000, 1202.</p> <p><i>Radiotelephonic communication with aircraft in flight</i> (Croydon is the control station for this routine within the British Isles).</p> <p><i>D.F. Service for aircraft.</i></p> <p><i>W/T Routine</i> as necessary.</p> <p><i>Radiotelephonic communication with aircraft in flight.</i></p> <p><i>Route Meteor. Messages</i> to Air Ministry at 0800, 0900, 1100, 1200 and 1300 daily.</p> <p><i>Radiotelephonic communication with aircraft in flight.</i></p> <p><i>W/T Routine</i> as necessary.</p> <p><i>D.F. work</i> with Croydon.</p>
Castle Bromwich Aerodrome	900 1300	
Croydon (Air Port of London)	900	
Manchester Aerodrome	900 900 900 1300	
Lympne Aerodrome	900	
Pulham Aerodrome	900	

† N.B.—In cases where delay in commencing transmission on 4,100 metres is occasioned, should transmission not have been commenced at the expiration of ten minutes, the message will be issued on 1,400 metres commencing at ten minutes after the routine hour.

‡ Navigational warnings to airmen, as referred to in N. to A. No. 25 of 1922, are issued, when required, after the routine Synoptic Reports. Transmission is made on 4,100 metres (not 1,400 metres), and the above-mentioned N. to A. is amended accordingly.

SECTION I.—BRITISH ISLES—*continued.*

Station.	Wavelength in Metres.	Routine.
Renfrew Aerodrome ..	900 1300	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Meteor. Messages to Air Ministry at 0705, 1005, 1305, 1605, 1805.</i>
Bickendorf Aerodrome (Cologne). This station in Rhineland Occupied Territory is temporarily staffed and operated by the Department of Civil Aviation, Air Ministry	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages with Air Ministry (GFA) and Brussels (OPVH) as necessary.</i> <i>Hourly Route Weather Messages are issued at 0913, 1013, 1113, 1213, 1313, 1413, 1513 daily. The station is open from 0900-1600.</i>
Lerwick (Meteorological observatory).	600 (Spark) 1400 (Spark)	<i>Communication with Wick for G.P.O. in cases of necessity.</i> <i>Meteor. Routine as requisite.</i>
Any R.A.F. or Civil Aviation Ground W/T Station.	—	The procedure for using this general call sign is as shown in the following example :— Aircraft G—EXYZ is about to make a forced landing and wishes to communicate with the nearest R.A.F. W/T station. The aircraft makes (in all cases stating its approximate position) :— CT GEZ GEZ GEZ de GEXYZ GEXYZ GEXYZ BT OVER ASHFORD 1400 aaa ENGINE TROUBLE AR. The nearest R.A.F. W/T station will then reply, using the call sign GEZ and stating its name, thus :— CT GEXYZ GEXYZ GEXYZ de GEZ GEZ GEZ BT HAWKINGE ANSWERING AR.

SECTION II.—BELGIUM.

Station	Wavelength in Metres.	Routine.
Haren (Air Port of Brussels)	900 1400	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i>
Ostende (Aerodrome) ..	1400 1500 1680	Reception only.
Brussels (Royal Meteor Institute)	1500 1680	<i>Meteor. Message at 1200.</i> <i>Meteor. Messages at 0424*, 0524*, 0624*, 0724, 0824, 0924, 1024, 1124, 1224, 1324, 1424, 1524, 1624.</i>

SECTION III.—FRANCE.

Station.	Wavelength in Metres.	Routine.
Le Bourget (Air Port of Paris)	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic as necessary.</i> <i>Hourly Route Weather Messages at 0328*, 0428*, 0528*, 0628*, 0728, 0828, 0928, 1028, 1128, 1228, 1328, 1428, 1528, 1628.</i>
St. Inglevert Aerodrome	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i> <i>Hourly Route Weather Messages at 0509*, 0609*, 0709, 0809, 0909, 1009, 1109, 1209, 1309, 1409, 1509, 1609.</i>
Antibes	1680	<i>Route Traffic as necessary.</i> <i>Meteor. Messages at 0710, 0910, 1115, 1310, 1810.</i>
Bayonne	1300	<i>Route Traffic as necessary.</i> <i>Meteor. Messages at 0715, 0945, 1315, 1815.</i>
Bordeaux	1300 1500	<i>Route Traffic Messages as necessary.</i> <i>Meteor. Messages.</i>
Dijon	1400	<i>Traffic as necessary.</i> <i>Meteor. Messages at 0715, 0945, 1315.</i>

SECTION III.—FRANCE—continued.

Station.	Wavelength in Metres.	Routine.
Lyon	1400	Route Traffic Messages as necessary. Meteor. Messages at 0640, 0710, 0940, 1310, 1800.
Marignane .. .	1680	Route Traffic as necessary. Meteor. Messages at 0724, 0953, 1324, 1824.
Montelimar .. .	1680	Meteor. Messages only at 0700, 0930, 1300 and 1800.
Nancy	1400 1450	Traffic as necessary. Meteor. Messages at 0515, 0615, 0715, 0915, 1015, 1115, 1315 and 1815.
Nîmes	1680	Traffic as necessary. Meteor. Messages at 0706, 0936, 1110, 1306, 1806.
Perpignan .. .	1300	Traffic as necessary. Meteor. Messages at 0710, 0910, 1110, 1310, 1810.
Romilly-sur-Seine ..	1400	Traffic as necessary. Meteor. Messages at 0618, 0718, 0818, 0918, 1018, 1118, 1318.
Strasbourg .. .	1400 1720 1720 or 2500	Traffic as necessary. Meteor. Messages at 0505, 0605, 0710, 0905, 1005, 1305 and 1805. Traffic with Prague.
Toulouse... ..	1300	Traffic as necessary. Meteor. Message at 1105.
Valenciennes .. .	1200 1400	Route Traffic as necessary. Hourly Meteor. Messages at 0540, 0605, 0705, 0805, 0905, 1105, 1205, 1305, 1405, 1505, 1605.

SECTION IV.—HOLLAND.

Station.	Wavelength in Metres.	Routine.
Soesterberg .. .	900 1400 1680 1900	Radiotelephonic communication with aircraft in flight. Route Traffic Messages. Meteor. Route Messages are issued daily at 0745, 0845, 0945, 1045, 1145, 1245, and 1345. 0730, 1005, 1330, 1505, 1830.
Schiphol (Air Port of Amsterdam) .. .	900	Radiotelephonic communication with aircraft in flight.
Rotterdam	900	Radiotelephonic communication with aircraft in flight.

UNITED STATES OF AMERICA.

The Postal Radio Service is owned and operated by the Post Office Department.

The United States Air Mail Service has been experimenting with aircraft radio since February, 1919. Its principal efforts have been directed to the solution of the problem of Radio Direction Finding and Radio Field Localising. The solution of these problems has been pursued with the aid of the Bureau of Standards and data furnished by the Navy Department, with considerable original research by the Air Mail Service. A simplified Radio Direction Finder, based on the Robinson principle of fixed A and B coils, was evolved, and has been practically applied to single-manned planes of this service. Pilots with no previous experience have flown directly over the radio stations at destination by this means.

The problem of field localising jointly solved by the Air Mail Service and the Bureau of Standards, has resulted in the discovery and practical application of the so-called Radio Frequency

Field Localiser System. This system in brief, consists of two large horizontal single-turn coils in which radio frequency currents flow in opposite directions. As a result, the electro-magnetic field extends upward in an expanding cone. An aeroplane utilising radio direction finding during periods of poor visibility can, of course, fly to the vicinity of the landing field. From this point the field localiser directs them to the immediate vicinity of the field itself.

During August, 1920, it was found that telegraph communication could not be furnished for the trans-continental Air Mail Service. As a result, it was decided on August 20th to install a chain of radio stations across the continent, tying in each of the Air Mail Fields.

There are eleven of these stations installed on or near various Air Mail fields. Those in operation are (1) College Park, Md., 2 kw. Quenched Spark; (2) Bellefonte, Pa., 5 kw. Quenched Spark; (3) Omaha, Neb., 6 kw. Quenched Spark; (4) Cheyenne, Wyo., 2 kw. Arc.

Stations located at the following points have been in operation since October 15th :—(1) Salt Lake City, Utah, 2 kw. Arc; (2) Elko, Nevada, 2 kw. Arc; (3) Reno, Nevada, 2 kw. Arc. The following stations were completed on November 1st 1920 :—(1) St. Louis, Mo., 5 kw. Quenched Spark; (2) North Platte, Nebr., 2 kw. Arc; (3) Rock Springs, Wyo., 2 kw. Arc.

These stations are not only used for inter-station traffic, but are also utilised for aeroplane radio communication and radio direction finding.

It is proposed to utilise all the radio stations of the Air Mail Service for Radio Research work, such as investigation of shifting signals, static and other kindred problems.

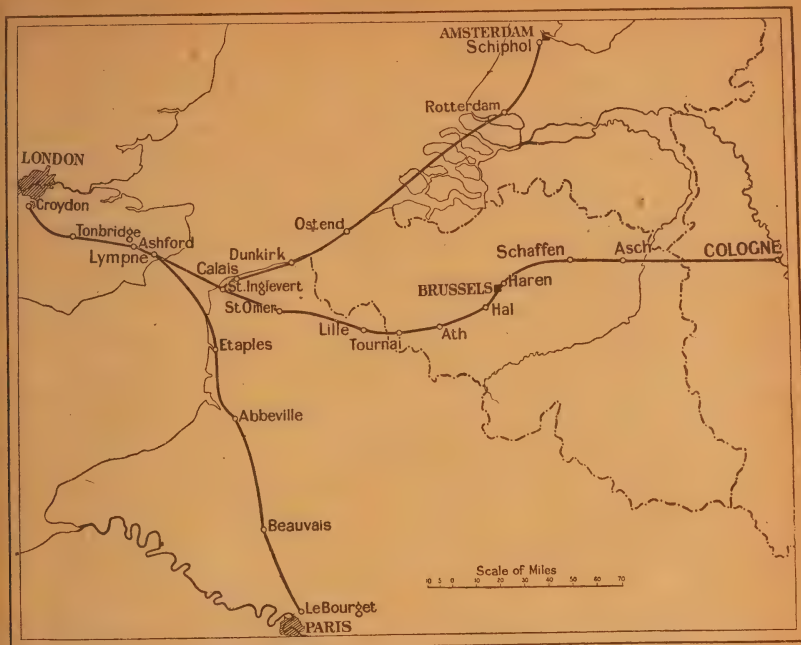
GERMANY.

The Koenigs Wusterhausen Station (Call Letters, LP) sends out notices for aircraft on a 3,600-metre wave at 1000 and 2000.

Additional information relating to Aircraft Wireless is contained in the Laws and Regulations section.



AIR MINISTRY CIVIL AVIATION RADIO STATIONS.

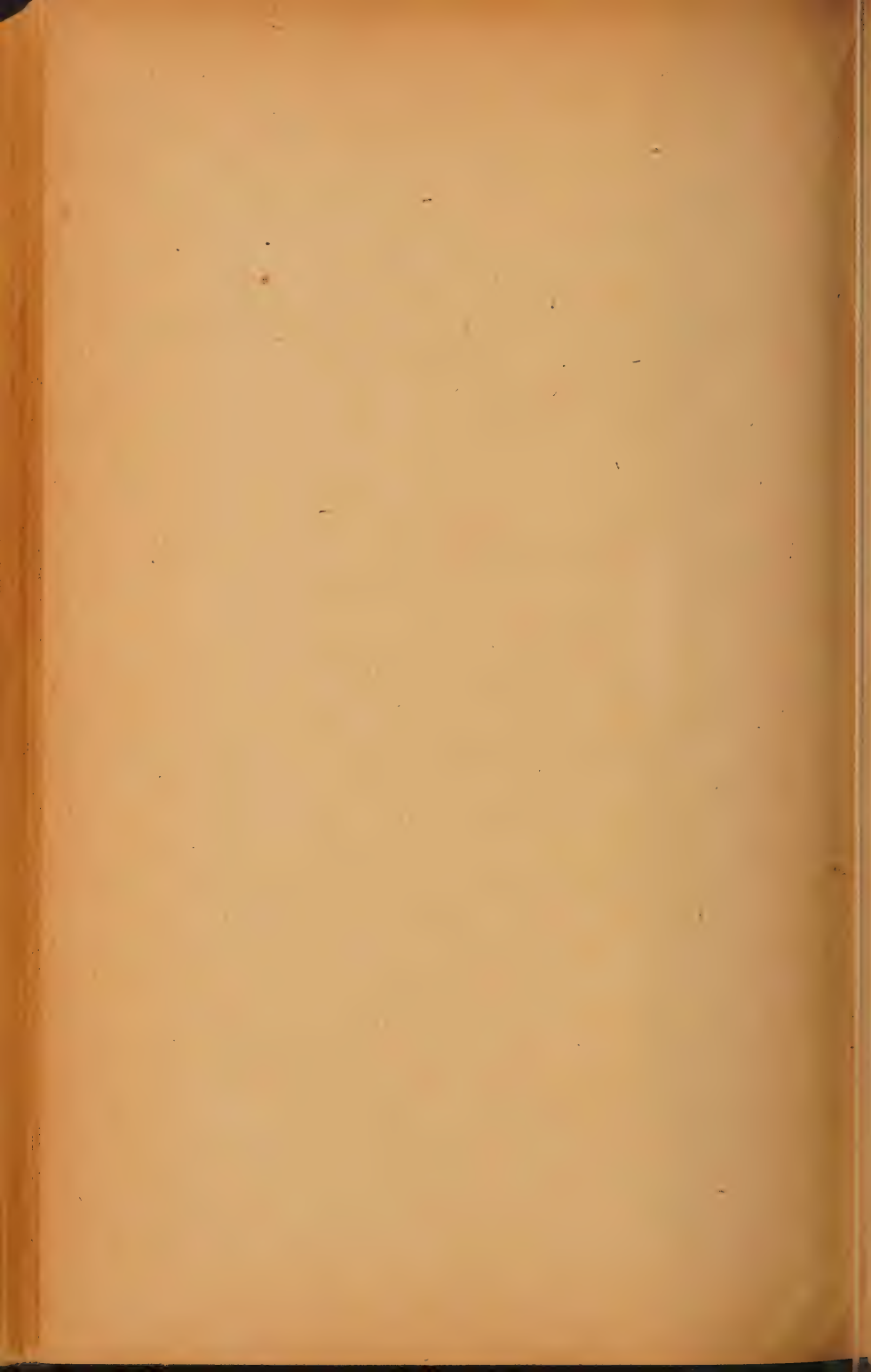


MAP OF THE LONDON TO PARIS, BRUSSELS, COLOGNE AIRWAYS.

E. TABLE OF MARKS

The nationality mark of the State named below applies to the aircraft of its Dominions, Colonies, Protectorates, Dependencies, or of countries of which it is the Mandatory Power.

Country.	Nationality Mark.	Registration of Marks.
United States of America	N	All communications made in accordance with the provisions of Section 1 (4) using a group of four letters out of the 26 of the alphabet, each group containing at least one vowel—e.g., ADCJ, PURN.
British Empire	G	
France	F	
Italy	I	
Japan	J	All communications made with B as first letter. <div> <div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> </div> <div> <div>C</div> <div>P</div> <div>R</div> <div>U</div> <div>B</div> <div>G</div> <div>L</div> <div>B</div> <div>P</div> <div>B</div> <div>P</div> <div>C</div> <div>H</div> <div>S</div> <div>S</div> <div>E</div> <div>G</div> <div>P</div> <div>H</div> </div> <div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> <div>..</div> </div> </div>
Bolivia	C	
Cuba	C	
Portugal	C	
Roumania	C	
Uruguay	L	
Czecho-Slovakia	L	
Guatemala	L	
Liberia	L	
Brazil	P	
Poland	P	
Belgium	O	
Peru	O	
China	X	
Honduras	X	
Serbia-Croatia-Slavonia	X	
Haiti	H	
Siam	H	
Ecuador	S	
Greece	S	
Panama	A	
Hedjaz	A	



USEFUL DATA

A.—Wireless Terminology : —

- (i) Definitions.
- (ii) Foreign Equivalents.

B.—General Information : —

- (i) Useful Tables.
- (ii) Graphical Symbols for Wireless
Diagrams.

USEFUL DATA

WIRELESS TERMINOLOGY

(i) DEFINITIONS.

AERIAL.—The system of conductors designed to radiate or absorb electro-magnetic waves.

AERIAL, DIRECTIONAL.—An aerial having the property of radiating or absorbing energy better in some directions than in others.

AERIAL, PLAIN.—An aerial in which the oscillations are produced by its own discharge, instead of being induced from another circuit.

ÆTHER.—See Ether.

AMPLIFIER.—An instrument which modifies the effect of a local source of energy in accordance with the variations of received energy, and in general produces a larger indication than could be had from the incoming energy alone. The triode is the most perfect amplifier of both high and low frequencies.

AMPLIFICATION, CO-EFFICIENT OF.—The ratio of the useful effect obtained by the employment of the amplifier to the useful effect obtained without that instrument. In particular the amplification constant of a triode may be defined as the ratio of the slopes of the grid voltage-anode current and the anode voltage-anode current characteristics at any operating point.

AMPLITUDE.—The maximum value of current or voltage attained during any half period of an alternating current or voltage.

ANODE.—The electrode by which the current enters the liquid or space within a vessel. Thus the anode is the negative plate of a primary cell, but the positive electrode of any other apparatus.

ANTENNA.—See Aerial.

ANTINODE.—A point of maximum amplitude on a stationary wave.

APERIODIC CIRCUIT.—A circuit which has no definite time period; this being due either to its resistance being larger than the critical resistance, or to its having no capacity or no inductance, and therefore no oscillatory properties.

ARC.—A luminous discharge of electricity through a gas in which the material of one or both of the electrodes is volatilised and takes part in the conduction of the current, whether continuous or alternating.

ARRESTER, EARTH.—A spark gap with a small gap and large sparking surfaces; used to protect receiving apparatus from powerful discharges.

ASYNCHRONOUS.—Rotating at a speed which has no fixed relation to some other speed, or to the frequency of some alternating current.

ATMOSPHERIC ABSORPTION.—That portion of the total loss of radiated energy due to atmospheric conductivity.

ATMOSPHERICS.—Electromagnetic waves produced by disturbances in the atmosphere or in the earth's surface.

ATTENUATION, CO-EFFICIENT OF.—The co-efficient which, when multiplied by the distance of transmission, gives the natural logarithm of the ratio of the amplitude of the electric or magnetic force at that distance to the initial value of the corresponding quantity.

AUDIO.—See Frequency, Audio.

AUDION.—De Forest's three-electrode valve.

AUTODYNE.—Another name for "self-heterodyne."

AUTO-TRANSFORMER.—A transformer in which the primary and secondary windings are tapped off the same coil and have a number of turns in common.

BALANCING AERIAL.—An aerial used in duplex wireless telegraphy to eliminate the effect of the local transmitter.

BEAT.—When two oscillations of slightly different frequencies are impressed on an electrical circuit, they periodically help and oppose each other. The result is an oscillation, the amplitude of which varies in a regular and periodic manner. The time between two successive maxima of amplitude is called the period of the beat. The beat frequency is equal to the difference of the frequencies of the component oscillations.

BUZZER.—A make and break producing weak oscillations which are very convenient for testing purposes.

CAPACITY.—That property of a material by virtue of which it is capable of storing energy electrostatically. The capacity of a system is dependent on its geometrical dimensions, its position relative to other conductors and the dielectric constants of the surrounding media.

CATHODE.—The electrode by which the current leaves the liquid or space within a vessel. Thus the cathode is the positive element of a primary cell, but the negative electrode of any other apparatus.

CHOKE.—A coil with large inductance and small resistance designed to prevent the passage of alternating current, but to permit the passage of continuous current.

CIRCUITS, CLOSED AND OPEN.—A closed oscillating circuit is one in which the capacity and inductance are substantially localised in different places, while an open radiating or absorbing circuit, though it may have additional localised capacity and inductance, contains the aerial with the capacity and inductance distributed throughout its length.

COHERER.—An early form of detector consisting of a contact or collection of contacts which cohere or become relatively conductive under the stimulus of an oscillating potential.

COMPASS, RADIO.—Another name for "Direction-finder."

COUNTERPOISE.—A system of electrical conductors forming one portion of a radiating oscillator, the other portion of which is the aerial. In land stations, a counterpoise forms a capacity connection to earth.

COUPLING.—The connection between two circuits by which energy is transferred from one to the other. The connection may be by magnetic, electro-static or direct coupling, or by any combination of these.

COUPLING, Co-EFFICIENT OF.—In inductively coupled circuits the ratio of the mutual inductance to the square root of the product of the separate self-inductances. The co-efficient of coupling (k) between any two circuits tuned to the same frequency and then coupled is given by the formula :—

$$k = \frac{\lambda_1^2 + \lambda_2^2}{\lambda_1^2 + \lambda_2^2}$$

where λ λ are the longer and shorter resulting natural wavelengths of the coupled system.

CRYSTAL.—A detector which uses the rectifying properties of the contact between a crystal and a metal surface, or between two crystals.

CYMOMETER.—A "wave-measurer."

DAMPING.—The diminution of energy due to the losses which always occur when it is alternating between the static and kinetic forms.

DECREMENT.—The natural logarithm of the constant ratio of the amplitudes of a damped oscillation in successive half periods.

DECREMETER.—An instrument for measuring decrement.

DETECTOR.—That portion of the receiving apparatus which enables the oscillations to operate an indicator either by controlling a local source of energy or by converting the radio frequency energy into a suitable form.

DIELECTRIC.—Any non-conductor forming part of an electric circuit.

DIELECTRIC CONSTANT.—The ratio of the capacity of a condenser with the dielectric to that of the same condenser without any dielectric.

DIFFACTION.—The deviation of the direction of propagation of a wave from the normal to the wave front at the point where the waves pass the edge of an obstruction. The amount of diffraction depends on the wavelength, and increases with increase of wavelength.

DIODE.—A two-electrode thermionic valve.

DIPLEX.—The simultaneous transmission and reception of two messages in the same direction between two stations.

DIRECTION FINDER.—A receiving instrument which, in combination with a special aerial system, enables the direction of the transmitting station to be determined.

DISCHARGER.—The piece of transmitting apparatus across the electrodes of which the spark discharge takes place.

DUPLEX.—The simultaneous transmission and reception of two messages in opposite directions between two stations.

DISPLACEMENT.—The transient current through a dielectric.

DYNATRON.—A triode which depends for its action on the liberation of electrons from the anode by electronic bombardment.

EARTH.—The connection to the earth which in most systems forms the lower extremity of the aerial system.

ELECTRODE.—The end of any metallic conductor in an electric circuit, with the exception of that in a condenser.

ELECTRON.—The natural unit of negative electricity (4.774×10^{-10} electrostatic units).

ENDODYNE.—Another name for "self heterodyne."

ETHER.—The medium assumed by the electromagnetic theory in order to explain the translation of energy at finite speed by electromagnetic waves.

FORM FACTOR.—The form factor of a symmetrical aerial for a given wavelength is the height of the centre of capacity (*i.e.*, the effective height) divided by the actual height.

FREQUENCY.—A term used in connection with any form of rhythmical motion or rhythmical change, denoting the number of complete movements or changes in a given time—usually a second.

FREQUENCY, AUDIO.—A frequency corresponding to the normally audible vibrations. These are assumed to lie below 10,000 cycles per second.

FREQUENCY, BEAT.—See Beat.

FREQUENCY, GROUP.—The frequency of definite variations in amplitude of an alternating current. The spark frequency.

FREQUENCY, RADIO.—A frequency higher than the normally audible vibrations, that is, higher than 10,000 cycles per second.

FUNDAMENTAL.—The longest stationary wave with any particular adjustment.

GRID.—The controlling electrode of a triode. It is generally in the form of a grid or mesh placed between the cathode and anode.

GROUND.—The American equivalent of "Earth."

HARD.—Applied to thermionic tubes containing an inappreciable amount of gas.

HARMONIC.—A stationary wave having a frequency which is a simple multiple of that of the fundamental, and consequently having additional nodes and antinodes.

HETERODYNE.—The production of beats by reaction between locally generated oscillations and the received oscillations.

HETERODYNE, SELF.—A receiver in which a triode acts simultaneously as a detector and as a generator of beat-producing oscillations.

HYSTERESIS.—The property of a body which causes the effect of changing conditions to lag behind those conditions, thus producing a loss.

IMPEDANCE.—The opposition to the flow of an alternating current. It is numerically equal to the square root of the sum of the squares of the resistance and the reactance of the circuit.

INDUCTANCE.—The opposition of a circuit (due to the magnetic field linked therewith) to any variation of the current flowing therein.

INTERFERENCE.—The reinforcement or neutralisation of waves arriving at a point along different paths from the same source.

IONISATION.—The liberation of electrons from the atoms of a gas, generally by collisions between the atoms and high-speed electrons.

JAR.—A capacity of a thousand centimetres.

JIGGER.—The air core transformer used to couple wireless circuits.

KALLIROTRON.—A form of aperiodic retroactive amplifier consisting of two thermionic valves so connected by pure resistances that a rise of grid potential of either produces a fall of grid potential of the other.

KATHODE.—See Cathode.

LEAK, GRID.—A high resistance connected across a condenser in series with the grid to limit the potential obtained.

LOOP.—Another name for antinode.

MAGNETIC.—A detector depending on the effect of oscillations on the hysteresis of iron.

MICROPHONE.—An instrument for magnifying sounds consisting of a resistance, usually in the form of an electrical contact, which resistance varies greatly with very small movements such as are produced by sound waves acting on a diaphragm.

NODE.—A point of zero amplitude on a stationary wave.

OSCILLATIONS.—High frequency alternations in tuned circuits.

OSCILLOGRAPH.—An apparatus for observing or recording quickly varying currents or potential differences.

PERIOD.—Any varying quantity which repeats its values regularly at equal time intervals is said to be periodic, and the time-interval of one repetition is called the periodic time or period.

PERMEABILITY.—The ratio of the magnetic flux density produced in any medium by a given magnetomotive force to that produced in a vacuum (or, for practical purposes, in air).

PHASE.—The stage or state to which a periodic variation has proceeded.

PLATE.—The anode of a thermionic tube.

PLIODYNATRON.—A combination of a pliotron and a dynatron, being a four-electrode thermionic tube. The output is controlled by the control grid which is between the filament and the heavier grid-anode.

PLIOTRON.—A very hard triode.

POLARISATION.—A wave is said to be plane polarised when its electric and magnetic displacements are confined to two fixed planes at right angles. When the plane of the electric and magnetic displacement rotates uniformly with time, the waves are said to be circularly or elliptically polarised.

POTENTIOMETER.—An instrument for adjusting at will the potential between two points.

QUENCHING.—Devices for cooling the spark gap in the primary of two closely coupled circuits, causing the spark to be extinguished as soon as the energy has passed over to the secondary circuit, and thus preventing its return.

RADIO.—American equivalent of "wireless." See also Frequency, Radio.

RADIOGRAM.—A telegram sent by wireless.

RADIOTELEPHONE.—An apparatus for the transmission of speech by wireless.

REACTANCE.—A function of the resistance inductance, capacity, and impressed frequency of a circuit. Also the American equivalent of "choke."

RECTIFIER.—An apparatus for converting alternating into continuous current, or into pulses of unidirectional current.

REFRACTION.—The change in the direction of propagation of a wave caused by a change in the medium.

RELAY.—An apparatus by means of which a current, too small to perform the required work, is made to control a larger and adequate current.

RESISTANCE.—That property of a conductor which transforms electrical energy into heat.

RESISTANCE, AERIAL.—That resistance which (other things being equal) would dissipate the same energy as the aerial radiates.

RESISTANCE, CRITICAL.—The limiting resistance beyond which the oscillatory discharge of a circuit passes into an aperiodic discharge.

RESONANCE.—The condition of being in tune.

ROOT-MEAN-SQUARE VALUE.—The R.M.S. value of an alternating current is the effective heating value.

SELECTIVITY.—The power of a receiving system to discriminate between a number of simultaneous signals.

SELF-INDUCTION.—Another name for "inductance."

SKIN EFFECT.—A high frequency current is not equally distributed through the cross-section of a conductor, but is greatest at the surface and least at the centre.

SOFT.—Applied to thermionic tubes containing an appreciable amount of gas.

SPACE CHARGE.—The electric charge of the electrons or positive ions situated in the space between the electrodes of a thermionic tube.

SPARK.—An electrical discharge across a gap.

SPECIFIC INDUCTIVE CAPACITY.—Another name for “dielectric constant.”

STATIC.—The American equivalent of “atmospherics.”

STRAYS.—Another name for “atmospherics.”

SYNCHRONOUS.—Rotating at a speed which has a fixed relation to some other speed or to the frequency of some alternating current.

SYNTONY.—The adjustment of one circuit to another, or of one transmitter taken as a whole to one receiver taken as a whole, in such a way that their time-periods are the same, and waves of a different time-period produce little or no effect on the system.

THERMIONS.—Electrons liberated from an incandescent cathode.

TICKER, TIKKER.—A rapid make-and-break device used in conjunction with a resonant circuit and a pair of telephones as a receiver for continuous waves.

TONE WHEEL.—A high speed commutator used as a receiver for continuous waves. It is run at a speed slightly different from the synchronous speed for the wave frequency, and in effect converts the high frequency current into a current of audible frequency.

TRAIN OF WAVES.—The waves produced by one discharge of the primary condenser in a spark circuit.

TRANSFORMER.—An apparatus for transferring energy from one circuit to another by magnetic induction. It may or may not alter the potential.

TRIODE.—A three-electrode thermionic tube.

TUNING.—The process of securing the maximum indication by adjusting the time period of a driven element.

UNDAMPED.—Having zero decrement.

VALVE.—A rectifier possessing unidirectional conductivity generally used as a detector.

WAVE.—A periodic variation in time and space.

WAVELENGTH.—The distance (measured in the line of propagation of the wave) between two consecutive maxima of the same sign.

WING CIRCUIT.—Another name for the anode circuit of a triode.

X's.—Another name for “atmospherics.”

(ii) FOREIGN EQUIVALENTS.

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Accumulator batteries	Batterie d'accumulateurs	Batterie di accumulatori	Acumuladores, Baterias de	Accumulatoren Batterie
Aerial, balancing	Antenne de compensation	Antenna di compensazione	Antena compensadora	Wage Antenne
Aerial, directional	Antenne dirigée	Antenna dirigibile	Antena dirigida	Gerichtete Antenne
Aerial, direction finder	Antenne réception dirigée	Antenna, rivelatrice della direzione	Antena para busca de direcciones	Antenne, zur Entdeckung der Richtung
Aerial, horizontal	Antenne horizontale	Antenna orizzontale	Antena horizontal	Horizontaler Luftleiter
Aerial, receiving	Antenne de réception	Antenna di ricezione	Antena de recepcion	Empfangsdraht
Aerial, transmitting	Antenne d'émission	Antenna di trasmissione	Antena de transmission	Geberdraht (Sendeluftleiter)
Aerial, umbrella	Antenne en parapluie	Antenna a forma di ombrella	Antena en forma de paraguá	Schirmnetz
Alternator	Alternateur	Alternatore	Alternador	Wechselstrom Generator
Alternator, high-frequency	Alternateur à haute fréquence	Alternatore ad alta frequenza	Alternador de alta frecuencia	Hochfrequenz Generator
Ammeter, a.c.	Ampermètre pour courant alternatif	Amperometro per corrente alternata	Amperímetro, c a	Wechselstromamperemeter
Ammeter, d.c.	Ampermètre pour courant continu	Amperometro per corrente continua	Amperímetro, c c	Gleichstromamperemeter
Ammeter, hot-wire	Ampermètre à fil chaud	Amperometro a filo caldo	Amperímetro térmico	Hitzdrahtamperemeter
Ammeter, moving coil	Ampermètre d'Arsonval	Amperometro a bobina móvil	Amperímetro de bobina móvil	D'Arsonvalscher Ampere-meter
Amplifier, thermionic	Amplificateur à lampes	Amplificatore termionico	Amplificador termionico	Vakuum-röhren Verstärker
Anode	Anode	Anodo	Anodo	Anode
Antenna	Antenne	Antenna	Antena	Luftleiter (Antenne)
Antenna, horizontal extension of	Branche horizontale de l'antenne	Fili orizzontali dell'antenna	Antena, Prolongación horizontal de la	Horizontale Verlängerungsdrabte des Luftleiters
Antenna, T-shaped	Antenne en T	Antenna a forma di T	Antena en forma de T	T förmige Antenne
Antenna, extended T-shaped	Antenne en T à branches horizontales prolongées	Antenna a forma di T allungata	Antena en forma de T prolongada	Verlängerte T Luftleiter
Apparatus, receiving	Appareils de réception	Apparecchi di ricezione	Aparatos receptores	Empfänger
Apparatus, transmitting	Appareils de transmission	Apparecchi di trasmissione	Aparatos transmisores	Sender
Arrester, earth terminal	Eclateur de mise à terre	Morsetto per presa di terra	Espacio de chispa de tierra	Unterbrochener Erdschluss
Arrester, lightning	Parafoudre	Dispositivo scaricafulmine	Pararayos	Blitzschutz
Atmospheres	Perturbations atmosphériques	Perturbazioni atmosferiche	Perturbaciones atmosféricas	Luftstörungen

Battery of Leyden jars	Batterie de bouteilles de Leyde	Batteria di bottiglie di Leyda	Bateria de Botellas de Leyden	Batterie Leydener Flaschen
Beats (Heterodyne)	Battements	Battimenti	Pulsaciones	Lockklingel
Bell, call-	Sonnerie d'appel	Barre collectrici principali	Timbre de Llamada	Haupt Sammelschienen
Busbars, main-	Barres omnibus principales	Fabbricato della stazione	Edificio de la estación	Stationhaus
Building, station-	Bâtiment du poste radio-télégraphique	Vibratore	Zumbador	Summer
Buzzer	Vibrateur	Cicala per la pratica della ricezione a udito	Zumbador para práctica	Übungssummer
Buzzer, practice	Vibrateur d'apprentissage	Capacità	Capacidad	Aufnahmefähigkeit
Capacity	Capacité	Capacità di terra	Capacidad de tierra	Gegengewicht
Capacity earth	Contre-poids	Catodo incandescente	Cátodo incandescente	Glühende Kathode
Cathode, incandescent	Cathode incandescente	Commutazione per ricezione	Cambio de conexiones para la recepción	Umschaltung auf Empfangen
Change of connections for receiving	Commutation pour la réception	Commutazione per trasmissione	Cambio de conexiones para la transmisión	Umschaltung auf Senden
Change of connections for transmitting	Commutation pour la transmission	Bobine di protezione a nucleo d'aria	Bobinas de reactancia, protectoras, de núcleo de aire	Impedanzspulen für hohe Frequenz mit Luftkern
Chokes, air core protecting	Bobine de reactance sans noyau de fer	Rocchetto d'autoinduzione	Bobina de reactancia	Drosselspule
Choking coil	Bobine d'impédance	Interruttore	Interruptor con apertura y cierre automáticos	Strom- unterbrecher und Strom-schliesser
Circuit breaker and closer	Dijoncteur et conjointeur automatique	Circuito oscillante chiuso	Circuito oscilante cerrado	Geschlossener Erregerkreis
Circuit, closed oscillating	Circuit oscillant fermé	Circuito intermedio	Circuito intermedio	Zwischenkreis
Circuit, intermediate	Circuit intermédiaire	Circuito radiante aperto	Circuito radiador abierto	Offener Strahlungskreis
Circuit, open radiating	Circuit radiant ouvert	Circuito oscillante	Circuito oscilante	Schwingungskreis
Circuit, oscillatory	Circuit oscillatoire	Ricevitore a coherer	Coheser	Fritterempfang
Coherer	Cohereur	Rocchetto di sintonizzazione	Bobina de sintonización	Abstimmspule
Coil, syntonising	Inductance de syntonisation	Commutatore	Commutador	Stromwender
Commutator	Commutateur	Collettore	Colector	Stromwender
Commutator (of Dynamo)	Collecteur	Condensatori	Condensadores	Kondensatoren
Condensers	Condensateurs	Condensatore regolabile	Condensador variable	Variabler Kondensator
Condenser, adjustable	Condensateur réglable	Condensatore a disco regolabile	Condensador de disco, variable	Drehkondensator
Condenser, adjustable disc	Condensateur à disque	Condensatore per la sintonizzazione dell' antenna	Condensador de sintonización de la antena	Kondensator zur Luftleiterabstimmung
Condenser, aerial tuning	Condensateur de syntonisation d'antenne	Condensatore ad aria	Condensador de dieléctrico de aire	Luftkondensator
Condenser, air	Condensateur à air	Condensatore per tarature	Condensador para calibración	Eichungskondensator
Condenser, calibration	Condensateur étalon			

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Condenser circuit	Circuit du condensateur	Circuito del condensatore	Circuito del condensador,	Kondensatorkreis
Condenser, intermediate circuit	Condensateur du circuit intermédiaire	Condensatore per il circuito intermedio	Condensador del circuito intermedio	Kondensator im Zwischenkreis
Condenser, secondary circuit	Condensateur du circuit secondaire	Condensatore per il circuito secondario	Condensador del circuito secundario	Kondensator im Sekundärkreis
Condenser, short wave	Condensateur de raccourcissement	Condensatore per onda corta	Condensador de onda corta	Verkürzungskondensator
Condenser-system	Système de condensateur	Sistema di condensatori	Sistema de Condensadores	Kondensatorsystem
Condenser, twin-coupled	Condensateur jumelé	Condensatore a doppio accoppiamento	Condensador de doble accoplamiento	Kondensator, doppel geschaltete
Condensers, variable	Condensateurs réglables	Condensatori variabili	Condensadores variables	Variablerkondensatoren
Converter	Commutatrice	Convertitore	Convertidor	Drehumformer
Continuous wave	Onde entretenue	Onda continua	Onda continua	Kontinuierliche Welle
Continuous wave receiver	Recepteur pour ondes entretenues	Ricevitore d'onde non smorzata	Receptor para onda continua	Empfänger fuer kontinuierliche Welle
Coupling	Couplage	Accoppiamento	Acoplamiento	Kopplung
Couplings, flexible and insulating	Manchons d'accouplement souples et isolants	Accoppiamenti elastici ed isolanti	Acoplamientos flexibles y aisladores	Biegsame und isolierende Verbindungen
Current, alternating	Courant alternatif	Corrente alternata	Corriente alterna	Wechselstrom
Current, direct	Courant continu	Corrente continua	Corriente continua	Gleichstrom
Current, primary alternating	Courant alternatif primaire	Corrente alternata del circuito primario	Corriente alterna primaria	Primär Wechselstrom
Cut-out, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Selbsterbtrecher
Cymometers	Cymomètres	Cinometri	Cinómetro	Wellenmesser
Damping, high	Amortissement élevé	Forte smorzamento	Amortiguamiento, Gran	Grosse Dämpfung
Decrementer	Décrémètre	Decrimetro	Decrémetro	Dekrementer (Dämpfungsmesser)
Detector, crystal	Détecteur à cristal	Rivelatore di onde a cristallo	Detector de cristal	Krystalldetektor
Detector, Fleming valve	Récepteur à valve d'oscillation "Fleming"	Rivelatore di onde con valvola di Fleming	Detector de Válvula, Fleming	Prof. Fleming's Valve-Empfänger
Detector, magnetic	Détecteur magnétique	Rivelatore di onde magnetico	Detector magnético	Marconi-Magnetdetektor
Detector, thermo-electric	Détecteur thermo-électrique	Rivelatore di onde termoelettrico	Detector termoelectrico	Thermo-elektrischer-detektor
Dielectric strength	Rigidité diélectrique	Rigidità dielettrica	Resistencia dieléctrica	Dielektrische Festigkeit
Discharger, asynchronous	Felateur asynchrone	Scaricatore asincrono	Descargador asincrono	Schleifenfunkenstrecke

speed	grande-vitesse	alta velocidad	centumkunsreche
Discharger, disc, smooth .	Eclateur à disque uni .	Scaricatore a disco a contorni lisci .	Rotierende Scheibenfunkenstrecke-glatt
Discharger, disc, studded .	Eclateur à disque—muni de prisonniers latéraux .	Scaricatore a disco con punte .	Rotierende Scheibenfunkenstrecke mit Zähne
Discharger, fixed .	Eclateur fixe .	Scaricatore fisso .	Scheibenfunkenstrecke, fixierter
Discharger, micrometric spark	Eclateur à étincelle micrométrique .	Scaricatore per la produzione di scintilla micrometrica .	Mikrometerfunkenstrecke
Discharger, synchronous .	Eclateur synchrone .	Scaricatore sincrono .	Scheibenfunkenstrecke, synchron
Duplex telegraphy .	Télégraphie duplex .	Telegrafia duplex .	Duplex Telegraphie
Earth connection .	Connexion de terre .	Messa a terra .	Erd Verbindung
Efficiency .	Rendement .	Rendimento .	Wirkungsgrad
Electromagnetic coupling .	Couplage électromagnétique .	Accoppiamento elettromagnetico .	Electromagnetische Kopplung
Electron emission .	Couplage d'électrodes .	Emissione elettronica .	Electronenemission
Electrostatic coupling .	Couplage électrostatique .	Accoppiamento elettrostatico .	Electrostatiche Kopplung
Filament battery .	Batterie des filaments .	Batteria d'accensione dei filamenti .	Heizbatterie
Frequency, high .	Haute fréquence .	Alta frequenza .	Hochfrequenz
Frequency, low .	Basse fréquence .	Bassa frequenza .	Niedfrequenz
Frequency meter .	Fréquence-mètre .	Frequenziometro .	Frequenzmesser
Generating plant .	Générateur .	Impianto generatore .	Stromanlage
Generator, c.c. .	Dynamo .	Generatore di corrente continua .	Dynamo (Gleichstrom)
Grid .	Grille .	Griglia .	Gitter
Grid circuit .	Circuit de grille .	Circuito di griglia .	Gitter Kreis
Grid leak .	Résistance du circuit de la grille .	Reostato del circuito della griglia .	Gitter Ableitung
Group frequency .	Fréquence des groupes de trains d'ondes .	Frequenza dei gruppi di seguiti di onde .	Wellenzuggruppenfrequenz
Hammer-break, magnetic .	Interrupteur à marteau .	Interruttore magnetico a martello .	Magnetischer Hammerunterbrecher
Heterodyne .	Hétérodyne .	Eterodina .	Heterodyn
Heterodyne receiver .	Hétérodyne .	Ricevitore a eterodina .	Überlagerungs Empfänger

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Impedance	Impédance	Impedenza	Impedancia	Scheinbarer Widerstand
Inductance, aerial	Inductance d'antenne	Induttanza dell' antenna	Induttancia de antena	Antenneninduktanz
Inductance, aerial tuning	Inductance à syntoniser le circuit de l'antenne	Induttanza per la sintonizzazione dell' antenna	Induttancia de sintonización de la antena	Induktanz zum Syntonisieren der Antenne
Inductance, low frequency	Bobine d'inductance du circuit à basse fréquence	Induttanza per il circuito a bassa frequenza	Induttancia del circuito de baja frecuencia	Induktanzspule niedriger Frequenz
Inductance, primary	Inductance primaire	Induttanza per circuito primario	Induttancia primaria	Primärinduktanz
Inductance, primary syntonising	Inductance primaire de syntonisation	Induttanza sintonizzatrice del circuito primario	Induttancia primaria de sintonización	Primärinduktanz zum Abstimmen
Inductance, variable primary syntonising	Inductance primaire variable de syntonisation	Induttanza sintonizzatrice del circuito primario, regolabile	Induttancia variable de sintonización del primario	Veränderliche Primärinduktance zum Abstimmen
Induction coil	Bobine d'induction	Rocchetto d'induzione	Bobina de inducción	Rhumkorffscher Funkeninduktor
Insulation	Isolation	Isolamento	Aislamiento	Isolierung
Insulation resistance	Résistance d'isolament	Resistenza d'isolamento	Resistencia de aislamiento	Isolation Widerstand
Insulator, leading-in	Isolateur d'entrée	Isolatore d'entrata	Aislador de entrada	Isolator, Einführungs
Insulator, flexible	Isolateur souple	Isolatore elastico	Aislador flexible	Flexibler Isolator
Insulator, receiving	Isolateur de réception	Isolatore dell' antenna di ricezione	Aislador para circuito receptor	Isolator für den Empfangsdraht
Insulator, transmitting	Isolateur de transmission	Isolatore dell' antenna di trasmissione	Aislador para circuito transmisor	Isolator für die Senderantenne
Interrupter	Rupteur	Interruttore	Interrupor	Unterbrecher
Interrupter, current	Rupteur de courant	Interruttore di corrente	Interruptor de corriente	Stromunterbrecher
Interrupter, electrolytic	Rupteur électrolytique	Interruttore elettrolitico	Interruptor electrolítico	Wehnelt Unterbrecher
Interrupter, turbine.	Turbo-rupteur à mercure	Interruttore a turbina	Interruptor de turbina	Quecksilberturbinenunterbrecher
Jigger	Transformateur d'oscillations	Trasformatore delle correnti oscillatorie	" Jigger "	Jigger, Selbst-induktion des Erregerkreises
Jigger, balanced	Jigger compensé	Trasformatore ad alta frequenza compensato	Jigger compensador	Jigger, balanzierter
Jigger, primary	Primaire de transformateur d'oscillation	Circuito primario del trasformatore delle correnti oscillatorie	" Jigger," primario del	Primär-Jigger
Jigger, secondary	Secondaire de transformateur d'oscillation	Circuito secundario del trasformatore delle correnti oscillatorie	" Jigger," secundario del	Sekundär-Jigger

Antenna	Antenna	Antenna	Antenna	Antenna
Lamp, tuning—and choke Leyden jar Leyden jar, battery of Lightning arrester. (See Arrester, lightning) Loading coil	Lampe de Syntonisation avec bobine de réactance Bouteille de Leyde. Batterie de bouteilles de Leyde Self de syntonisation	Lampada di sintonizza- zione con rocchetto di reazione Bottiglia di Leyda. Batteria di bottiglie di Leyda Induttanza d'aereo	Lámpara de sintonización con carrete de reactancia Botella de Leyden. Bottellas de Leyden, Bateria de Inductancia adicional	Syntonsierlampe mit Im- pedanz Leydener Flasche Batterie Leydener Flas- chen Verlängerung Spule
Magnetic amplifier Mast, portable Masts, steel sectional Mast, telescopic Microphone Microphone apparatus Micrometer, spark Motor alternator disc set	Amplificateur à trans- formateurs Mât, portatif Mâts d'acier à sections Mât, télescopique Microphone Appareil microphone Micromètre à étincelle Groupe moteur alterna- teur avec éclateur à disque Antenne multiple Transmission et réception multiples	Amplificatore magnetico Albero, portatile Albero di acciaio diviso in sezioni Albero telescopico Microfono Apparecchio microfonico Micrometro di Scintilla Gruppo convertitore con scaricatore a disco Antenna multipla Trasmissione e Ricezione multipla	Amplificador magnético Mástil portátil Mástil de secciones de acero Mástil telescopico Microfono Aparato microfonico Micrometro de chispa Grupo de motor, alter- nador con estallador de disco Antena múltiple Transmisión y recepción multiple	Magnetische Verstärker Tragbarer Mast Stahlmasten in Teilen Teleskopmast Microphon Microphon-Apparat Funkenmikrometer Wechselstromgenerator kombiniert mit Rotier- ende Funkenstrecke Mehrfache Antenne Vielfache Übermittlung und Empfang
Multiple antenna Multiple transmission and reception Oscillations, electric. Oscillating valve Oscillatory circuit Overload	Oscillations électriques Oscillateur à lampes Circuit oscillant Surcharge	Oscillazioni elettriche Valvola oscillante Circuito oscillante Sovraccarica	Oscilaciones eléctricas Valvula oscilatoria Circuito oscilante Sobrecarga	Elektrische-Schwingungen Röhrensender Schwingsungs Kreis Überlast
Plant, radiotelegraphic Plate Plate circuit Potentiometer	Installation graphique Plaque, Anode Circuit de plaque Potentiomètre	Impianto radiotelegrafico Placa Circuito di piastra Potenziometro	Instalación radiotelegrá- fica Placa Circuito de placa Potenciómetro	Radiotelegraphische An- lage Anod, Platte Anoden Kreis Potentiometer
Radiating antenna Radio frequency	Antenne transmettrice Haute fréquence	Antenna irradiante Frequenza radiotele- grafica	Antena radiadora Frecuencia radio	Strahlende Antenne Radio frequenz

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Radiogoniometer	Radiogoniomètre	Radiogoniometro	Radiogoniometro	Radiogoniometer
Range	Portée	Portata	Alcance	Reichweite
Reactance	Réactance	Reattanza	Reactancia	Inductive Widerstand
Reaction coupling	Couplage des réactions	Accoppiamento di reazione	Acoplamiento de reacción	Rück Kopplung
Receiver	Appareil récepteur	Apparecchio ricevitore	Receptor	Empfänger
Receiver arrangement	Dispositif de réception	Dispositivo di ricezione	Dispositivo de recepción	Empfangsvorrichtung
Receiver, balanced	Récepteur compensé	Ricevitore compensato	Receptor compensador	Empfänger, balanzierter
Receiver, flexible	Récepteur souple	Ricevitore flessibile	Receptor flexible	Empfänger
Receiver, vacuum valve	Récepteur à valve d'oscillation	Ricevitore con valvola a vuoto	Receptor de válvula de vacío	Vakuum ventil Empfänger
Rectifiers	Rectificateurs	Rectificadores	Rectificador	Ausgleichsicher
Relay	Relais	Soccorritore	Relevador	Relais
Relay H.T.	Relais pour haute tension	Soccorritore ad alta tensione	Relevador A.T.	Hochspannungsrelais
Relay magnets	Aimants du relais	Magneti di soccorritore	Imanes del relevador	Relais-magnète
Resistance, high	Haute résistance	Alta resistenza	Resistencia, alta	Hoher Widerstand
Resistance, low	Basse résistance	Bassa resistenza	Resistencia, baja	Niedriger Widerstand
Resistance, starting	Rhéostat de démarrage	Reostato di avviamento	Reostato de arranque	Anlasser
Resistance regulating	Rhéostat de champ	Reostato di campo.	Resistencia de regulación	Regulierwiderstand
Screening box	Boîte de garde	Cassetta di protezione	Caja de resguardo	Schutzkasten
Series rheostat	Rhéostat en série	Reostato in serie	Reostato en serie	Serien Widerstand
Ship station	Station de bord	Stazione navale	Estación de a bordo	Schiffstation
Short circuiting device	Dispositif de mise en court circuit	Dispositivo di messa in corto circuito	Dispositivo de corto circuito	Kurzschliesser
Shunt, highly inductive	Shunt à pouvoir inductif élevé	Shunt ad alta induzione	Shunt altamente inductivo	Shunt mit hohe Selbstinduktion
Shunt, non-inductive	Shunt, non-inductif	Circuito in derivazione non-induttivo	Shunt, no inductivo	Nebenschluss
Signals, balancing	Signaux équilibrés	Segnali equilibrati	Señales compensadoras	induktionsfreier Balanciersignale
Signals, telephone	Signaux téléphoniques	Segnali del telefono	Señales telefónicas	Telephonsignale
Spark	Étincelle	Scintilla	Chispa	Funke
Spark coil, with hammer-break	Bobine d'induction à interrupteur à marteau	Rocchetto d'induzione a martello	Bobina de chispa con interruptor de martillo	Funkeninduktor mit Hammerunterbrecher
Spark gap	Eclateur à étincelle	Scaricatore	Estallador de chispa	Funkenstrecke
Spark gap, micrometric	Eclateur à intervalle micrométrique	Scaricatore micrometrico	Estallador micrométrico.	Micrometer Funkenstrecke
Spark micrometer	Micromètre à étincelles	Micrometro di scintilla	Micrómetro de chispa	Funkenmikrometer
Spark gap, multiple	Eclateur en série	Oscillatore multiplo	Espacio de chispa multiple	Unterteilte Funkenstrecke

Spark gap, quenched	Edateur pour étincelle étouffée	Scaricatore per oscillazioni smorzate	Descargador de chispa extinguida	Gedaempfte Funkentstrecke
Spark quenched	Étincelle étouffée	Scintilla smorzata	Chispa extinguida	Löschfunke
Sparkling distance	Distance explosive	Distanza esplosiva	Distanza esplosiva	Funkentrecke
Specific inductive capacity	Capacité inductive spécifique	Capacità induttiva specifica	Capacidad inductiva específica	Dielectricitäts Konstante
Starter, automatic	Démarreur, automatique	Avviatore automatico	Reostato de arranque automático	Selbstanlasser
Starter, combined with shunt regulator	Rhéostat de démarrage avec rhéostat de champ	Reostato di avviamento combinato con regolatore in derivazione	Reostato de arranque y regulador de campo combinados	Anlasswiderstand mit Nebenschlussregler
Starter, single-phase	Démarreur monophasé	Avviatore per corrente monofase	Reostato de arranque monofásico	Einphasenanlasser
Starter, three-phase	Démarreur tri-phasé	Avviatore per corrente trifase	Reostato de arranque trifásico	Dreiphasenanlasser
Station, aeroplane	Aéroplane (poste d')	Stazione per aeroplano	Estación para aeroplano	Flugzeug Station
Station, airship	Station de ballon dirigeable	Stazione per aeronave	Estación para globos dirigibles	Luftschiffstation
Station, high-power	Station à grande puissance	Stazione di grande potenza	Estación de gran potencia	Kraftstation
Station, landing	Poste de débarquement	Stazione da sbarco	Estación de desembarco	Landungsstation
Station, long-distance	Poste de grandes distances	Stazione ultrapotente	Estación de gran alcance	Radio-telegraphische Grossstation
Station, portable	Station portative	Stazione portatile	Estación portátil	Tragbarestation
Station, portable military	Poste militaire transportable	Stazione militare mobile	Estación militar portátil	Tragbare Militärstation
Station, radiotelegraph	Poste radiotélégraphique	Stazione radiotelegrafica	Estación radiotelegráfica	Funkenamts Kleinstation
Station, small-power	Station à faible puissance	Stazione di piccola potenza	Estación de pequeña potencia	
Swiss commutator	Commutateur suisse	Commutatore tipo svizzero	Commutador suizo	Schweizerische Kommutator
Switch, aerial change-over	Commutateur d'antenne	Commutatore dell'antenna	Commutador para cambio de hilos de antena	Luftdrahtumschalter
Switch, aerial heating	Commutateur, échauffement d'antenne	Interruttore per riscaldamento dell'antenna	Commutador de seguridad contra calentamiento de la antena	Umschalter zum heizen der Antenne
Switch, automatic break	Interruteur automatique d'excitation	Interruttore automatico di eccitazione	Interruptor automático del campo	Selbsttätiger Schalter
Switch, carbon break	Interruteur à contacts de charbon	Interruttore a carbone	Interruptor con contactos de carbon	Selbsttätiger Magnet-ausschalter
Switch, change-over	Commutateur de longueurs d'ondes	Commutatore di sintonizzazione	Commutador de sintonización	Kohlenschalter
Switch, change-tune	Commutateur de longueurs d'ondes	Commutatore di sintonizzazione	Commutador de sintonización	Umschalter Wellenumschalter
Switch, charging	Interruteur de charge	Interruttore di carica	Commutador de carga	Ladeschalter
Switch, combined fuse and	Interruteur avec coupe circuit	Fusibile ed interruttore combinati	Interruptor con fusible	Schalter und Sicherung kombiniert
Switch, double-bladed knife	Interruteur bipolaire à lames	Interruttore doppio a coltello	Interruptor de cuchillo bipolar	Doppelmesserschalter

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Switch, double-pole Switch, double double throw Switchboard, d.c. and a.c.	Interrupteur bipolaire Commutateur bipolaire à deux directions Tableau de distribution pour courant continu et alternatif Interrupteur de l'excita- tion Interrupteur pour haute tension Téléinterrupteur pour haute tension	Interruttore bipolare Interruttore bipolare a doppio effetto Quadro di distribuzione per corrente continua ed alternata Interruttore ad eccita- zione Interruttore per alta ten- sione Interruttore ad alta ten- sione comandato a dis- tanza Interruttore a coltello	Interruptor bipolar Commutador bipolar de dos posiciones Cuadro de distribución de c.a. y c.c. Interruptor del campo Interruptor de alta ten- sión Teleinterruptor de alta tensión Interruptor de cuchillo	Zweipoliger Schalter Zweipoliger Umschalter Schalttafel fuer Gleich und Wechselstrom Magnetausschalter Hochspannungsschalter Hochspannungsfern- schalter Messerschalter
Switch, knife . Switch, main . Switch, oil-break . Switch, press (toggle) Switch, quick-break . Switch, single-pole Switch, three-phase Switch, three-way . Switch, voltmeter . Switch, wave-changing Syntonisation	Interrupteur unipolaire à lames Interrupteur principal Interrupteur à bain d'huile Interrupteur à pression Interrupteur à rupture brusque Interrupteur unipolaire Interrupteur pour cou- rant tri-phasé Commutateur à trois directions Interrupteur du volta- mètre Commutateur pour changement de longueur d'onde Syntonisation	Interruttore a pressione Interruttore a scatto rapido Interruttore unipolare Interruttore tripolare Commutatore a tre vie Interruttore per volt- metro Commutatore d'onda Sintonizzazione	Interruptor de tornillo Interruptor de rotura brusca Interruptor monopolar Interruptor trifásico Commutador de tres pasos Interruptor para voltí- metro Commutador de cambio de onda Sintonización	Hauptschalter Oelschalter Druckschalter Momentschalter Einpolgerschalter Drehtrommschalter 3 Wege Umschalter Voltmeterumschalter Wellen Umschalter Abstimmung
Tapper Telegraphy, directional wireless Three-electrode valve	Frappeur Radiotélégraphie dirigée Lampe à trois électrodes	Deocher Radioteleggrafia a sistema dirigibile Valvola a tre elettrodi	Decohesor de martillo Telegrafia sin hilos diri- gida Valvula de tres electrodos	Klopper Gerichtete Drahtlose Tele- graphie Vakuum röhre mit drei

Trailing aerial	Antenne pendante (pour avion)	Coda d'aereo	Antena colgante	Freihängende Antenne
Transformer, high-frequency oscillation	Transformateur d'oscillation à haute fréquence	Transformatore delle correnti oscillatorie ad alta frequenza	Transformador de oscilaciones de alta frecuencia	Transformator fuer Hochfrequenzschwingungen
Transformer, oscillatory	Transformateur d'oscillation	Transformatore delle correnti oscillatorie	Transformador oscilatorio	Oscillationsumformer
Transmitting arrangement	Dispositif d'émission	Dispositivo di trasmissione	Dispositivo de transmisión	Senderanordnung
Transmitter, cavalry	Transmetteur pour cavalerie	Trasmittitore di stazione per cavalleria	Transmisor para estación de cavaleria	Kavalleriesendeapparat
Transmitter, inductive	Transmetteur à couplage inductif	Trasmittitore ad accoppiamento induttivo	Transmisor de inducción	Gekoppelte Sender
Transmitter, sharply tuned	Transmetteur à syntonisation aiguë	Trasmittitore acutamente sintonizzato	Transmisor de sintonización aguda	Scharf abgestimmte Sender
Transmitter, simple (P.A.)	Dispositif d'émission directe	Trasmittitore semplice	Transmisor sencillo	Einfacher Sender
Tube, ebonite	Tube en ébonite	Tubo di ebanite	Tubo de ebonita	Ebonitrohre
Tuning	Syntonisation	Sintonizzazione	Sintonización	Abstimmen
Tuning, flat	Syntonisation non aiguë	Sintonizzazione piana	Sintonización aplastada	Unscharfes Abstimmen
Tuner, multiple	Syntonisateur multiple	Sintonizzatore multiplo	Sintonizador multiple	Vielfach Abstimmaparat
Tuning, note	Hauteur de la note	Sintonizzazione della nota	Sintonización de la nota	Tonhöhe der Abstimmung
Tuning, note and wave	Note et onde de syntonisation	Sintonizzazione della nota e dell'onda	Sintonización de la nota y de la onda	Abstimmen von Tonhöhe und Welle
Tuning wave	Onde de syntonisation	Onda di Sintonizzazione	Onda de Sintonización	Abstimmungswelle
Two or three valve amplifier	Amplificateur à deux ou trois lampes	Amplificatore a due o tre valvole	Amplificador de dos ó tres valvulas	—
Undamped wave. (See Continuous wave.)				
Valve	Valve	Valvola	Válvula	Ventil
Valve, vacuum	Valve à vide	Valvola a vuoto	Valvula de vacío	Vakuumventil
Voltage	Voltage	Potenziale	Voltaje	Spannung
Voltmeter, a.c.	Voltmètre pour courant alternatif	Voltmetro per corrente alternata	Voltmetro c.a.	Voltmeter fur Wechselstrom
Voltmeter, aperiodic	Voltmètre aperiódique	Voltmetro aperiódico	Voltmetro aperiódico	Aperiodisches Voltmeter
Voltmeter, d.c.	Voltmètre pour courant continu	Voltmetro per corrente continua	Voltmetro c.c.	Voltmeter fuer Gleichstrom
Voltmeter, hot-wire	Voltmètre à fil chaud	Voltmetro a filo caldo	Voltmetro térmico	Heizdrahtvoltmeter
Voltmeter, switch	Interrupteur de volt-mètre	Interruttore per voltmetro	Voltmetro, interruptor para	Voltmeterumschalter
Wave frequency	Fréquence des ondes	Frequenza dell'onda	Frecuencia de onda	Wellen frequenz
Wavelength	Longueur d'onde	Lunghezza d'onda	Longitud de onda	Wellenlaenge
Wavemeter	Ondamètre	Ondametro	Onómetro	Wellenmesser
Waves, radiation of	Radiation des ondes	Irraggiamento di onde	Radiación de las ondas	Ausstrahlung der Wellen

GENERAL INFORMATION AND USEFUL TABLES

INTERNATIONAL RULES FOR THE USE OF SYMBOLS*

* Extracted from the report of the International Electrotechnical Commission.

(a) Instantaneous values of electrical quantities which vary with the time to be represented by small letters. In case of ambiguity they may be followed by the subscript "t."

(b) Virtual or constant values of electrical quantities to be represented by capital letters.

(c) Maximum values of periodic electrical and magnetic quantities to be represented by capital letters followed by the subscript "m."

(d) In cases where it is desirable to distinguish between magnetic and electric quantities, constant or variable, magnetic quantities to be represented by capital letters of either script, heavy-faced or any special type. Script letters to be only employed for magnetic quantities.

(e) Angles to be represented by small Greek letters.

(f) Dimensions and special quantities to be represented, wherever possible, by small Greek letters.

I.—QUANTITIES.

Name of Quantity.	Symbol.	Name of Quantity.	Symbol.
Length	<i>l</i>	Resistance	<i>R</i>
Mass	<i>m</i>	Resistivity	<i>ρ</i>
Time	<i>t</i>	Conductance	<i>G</i>
Angles	<i>α, β, γ...</i>	Quantity of electricity	<i>Q</i>
Acceleration of gravity	<i>g</i>	Flux-density, electrostatic	<i>D</i>
Work	<i>A</i>	Capacity	<i>C</i>
Energy	<i>W</i>	Dielectric constant	<i>ε</i>
Power	<i>P</i>	Self-inductance	<i>L</i>
Efficiency	<i>η</i>	Mutual inductance	<i>M</i>
Number of turns in unit of time	<i>n</i>	Reactance	<i>X</i>
Temperature Centigrade	<i>t</i>	Impedance	<i>Z</i>
Temperature absolute	<i>T</i>	Reluctance	<i>S</i>
Period	<i>T</i>	Magnetic flux	<i>Φ</i>
$2\pi/T$	<i>ω</i>	Flux-density, magnetic	<i>B</i>
Frequency	<i>f</i>	Magnetic field	<i>H</i>
Phase displacement	<i>φ</i>	Intensity of Magnetisation	<i>J</i>
Electromotive force	<i>E</i>	Permeability	<i>μ</i>
Current	<i>I</i>	Susceptibility	<i>κ</i>

II.—UNITS. SIGNS FOR NAMES OF UNITS.

Signs for names of Electrical Units to be employed only after numerical values :—

Name of Unit.	Sign.	Name of Unit.	Sign.
Ampere	<i>A</i>	Volt-coulomb	<i>VC</i>
Volt	<i>V</i>	Watt-hour	<i>Wh</i>
Ohm	<i>Ω</i>	Volt-ampere	<i>VA</i>
Coulomb	<i>C</i>	Ampere-hour	<i>Ah</i>
Joule	<i>J</i>	Milliampere	<i>mA</i>
Watt	<i>W</i>	Kilowatt	<i>kW</i>
Farad	<i>F</i>	Kilovolt-ampere	<i>kVA</i>
Henry	<i>H</i>	Kilowatt-hour	<i>kWh</i>

m—Sign for milli- μ—Sign for micro- or micr- k—Sign for kilo- M—Sign for mega- or meg.

* As a sign for the ohm, one of the two letters *O* or *Ω* is recommended. The letter *Ω* should no longer be used for megohm.

III—MATHEMATICAL SYMBOLS AND RULES.

Name.	Symbol.	Name.	Symbol.
Total differential	d	Ratio of circumference to diameter	π
Partial differential	δ	Summation	Σ
Base of Napierian logarithms	e	Summation, integral	\int
Imaginary $\sqrt{-1}$	i		

Ordinary numerals as exponentials shall exclusively be used to represent powers. (In consequence, it is desirable that the expression $\sin^{-1}x$, $\tan^{-1}x$, employed in certain countries be expressed by $\arcsin x$, $\arctan x$.)

The comma and the full-stop shall be employed for separating the decimals according to the custom of the country, but the separation between any three digits constituting a whole number shall be indicated by a space and not by a full-stop or a comma (1 000 000).

For the multiplication of numbers and geometric quantities, indicated by two letters, it is recommended to use the sign \times , and the full-stop only when there is no possible ambiguity.

To indicate division in a formula, it is recommended that the horizontal bar or the colon be employed. Nevertheless the oblique line may be used when there is no possibility of ambiguity; when necessary, ordinary brackets $()$, square brackets $[\]$, and braces $\{ \}$, may be employed to obtain clearness.

IV—ABBREVIATIONS FOR WEIGHTS AND MEASURES.

Length:—m; km; dm; cm; mm; μ =0.001 mm. Surface:—a; ha; m²; km²; dm²; cm²; mm². Volume:—l; hl; dl; cl; ml; m³; km³; dm³; cm³; mm³. Mass:—g; t; kg; dg; cg; mg.

V—NAME FOR ELECTRICAL UNIT.

The name "Siemens" has been recommended for the unit of conductance.

SYMBOLS FOR MULTIPLES AND SUB-MULTIPLES.

Multiple or Sub-Multiple.	Name	Symbol.	Multiple or Sub-Multiple.	Name	Symbol.
10 ⁶	Mega	M	10 ⁻⁶	Micro	μ
10 ³	Kilo-	k	10 ⁻⁹	Millimicro-	m μ
10 ⁻³	Milli-	m	10 ⁻¹²	Pico	p or $\mu\mu$

The old usage of $\mu\mu$ as an abbreviation for 10⁻⁹ metre is undesirable. The prefix Billi- is sometimes used instead of Millimicro-.

THE "MILE" EQUIVALENTS OF VARIOUS NATIONS.

	English Yards.		English Yards.
Arabian mile	2,148	German mile, short	6,859
Bohemian mile	10,137	Hamburg mile	8,244
Brabant mile	6,082	Hanoverian mile	11,559
Burgundy mile	6,183	Hesse mile	19,547
Chinese li	629	Hungarian mile	9,115
Danish mile	8,244	Irish mile	2,240
Dutch mile	6,395	Italian mile	2,025
English mile, statute	1,760	Poland, mile, short	6,071
English mile, geographical	2,025	Poland mile, long	8,100
Flemish mile	6,869	Portuguese legoa	6,760
French posting league	4,263	Prussian mile	8,237
French marine league	6,075	Roman mile, modern	2,028
French legal league of 2,000 toises	4,263	Russian verst	1,167
German mile, geographical	8,100	Saxon mile	9,904
German mile, long	10,126		

WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

drachms.	oz.	lb.	qrs.	cwts.	ton.	grammes.
1 = 0.0625	= 0.0039	= 0.000139	= 0.000035	= 0.00000174	= 1.771846	
16 = 1	= 0.0625	= 0.00223	= 0.000558	= 0.000028	= 28.34954	
256 = 16	= 1	= 0.0357	= 0.00893	= 0.000447	= 453.59	
7168 = 448	= 28	= 1	= 0.25	= 0.0125	= 12,700	
28672 = 1792	= 112	= 4	= 1	= 0.05	= 50,802	
573440 = 35840	= 2240	= 80	= 20	= 1	= 1,016,048	

TROY WEIGHT.

grains.	dwt.	oz.	lb.	grammes.
1 $\frac{1}{2}$ =	0.04167	= 0.00208	= 0.0001736	= 0.0648
24 = 1		= 0.05	= 0.004167	= 1.555
480 = 20		= 1	= 0.0833	= 31.1035
5760 = 240		= 12	= 1	= 373.242
7,000 grains troy = 1 lb. avoirdupois				
175 lb. troy = 144 lb. avoirdupois				
lb. avoirdupois \times 1.2153 = lb. troy				
lb. troy \times 0.82286 = lb. avoirdupois				

LONG MEASURE.

in.	feet.	yards.	fath.	poles.	furl.	mile.	metres.
1 = 0.083	= 0.02778	= 0.0139	= 0.005	= 0.000126	= 0.0000158	= 0.0254	
12 = 1	= 0.333	= 0.1667	= 0.0606	= 0.00151	= 0.0001894	= 0.3048	
36 = 3	= 1	= 0.5	= 0.182	= 0.00454	= 0.000568	= 0.9144	
72 = 6	= 2	= 1	= 0.364	= 0.0091	= 0.001126	= 1.8287	
192 = 16 $\frac{1}{2}$	= 5 $\frac{1}{2}$	= 2 $\frac{1}{2}$	= 1	= 0.025	= 0.003125	= 5.0291	
7920 = 660	= 220	= 110	= 40	= 1	= 0.125	= 201.16	
63360 = 5280	= 1760	= 880	= 320	= 8	= 1	= 1609.315	

MEASURE OF CAPACITY.

pints.	gall.	peck.	bushel.	quarter.	wey.	last.	cub. ft.	litres.
1 = 0.125	= 0.0625	= 0.01562	= 0.00195	= 0.00039	= 0.000195	= 0.02	= 0.5676	
8 = 1	= 0.5	= 0.125	= 0.0156	= 0.00312	= 0.00156	= 0.1604	= 4.543	
16 = 2	= 1	= 0.25	= 0.03125	= 0.00625	= 0.00312	= 0.3208	= 9.082	
64 = 8	= 4	= 1	= 0.125	= 0.025	= 0.0125	= 1.283	= 36.32816	
512 = 64	= 32	= 8	= 1	= 0.2	= 0.1	= 10.264	= 290.625	
2560 = 320	= 160	= 40	= 5	= 1	= 0.5	= 51.319	= 1453.126	
5120 = 640	= 320	= 80	= 10	= 2	= 1	= 102.64	= 2906.25	

1 gallon in wine, ale, or dry measure

= 277 $\frac{1}{2}$ cubic inches = 0.16 cubic foot

= 10 lb. of distilled water =

Cube feet \times 6.2355 = gallons.

Cube ins. \times 0.003607 = gallons.

1 bushel = 2218.19 cube inches = 1.28 cube foot.

Cube feet = 0.78 = bushels.

Cube ins. \times 0.00045 = bushels.

SQUARE OR SURFACE MEASURE.

144 square inches = 1 square foot.

9 square feet = 1 square yard.

30 $\frac{1}{2}$ square yards = 1 square rod or perch.

40 square rods = 1 rood.

4 roods = 1 acre (4,840 square yards).

640 acres = 1 square mile (3,097,600 square yards).

METRIC SYSTEM OF WEIGHTS AND MEASURES.

The Metric System is based upon the estimated length of the fourth part of a terrestrial meridian. The ten-millionth part of this arc is called a *Metre*, and is the unit of length. The cube of the tenth part of a metre was adopted as the unit of capacity, and denominated a *Litre*. The weight of a litre of distilled water at its greatest density was called a *Kilogramme*, of which the thousandth part, or *Gramme*, was adopted as the unit of weight. The multiples of these, proceeding in decimal progression, are distinguished by the employment of the prefixes *deca*, *hecto*, *kilo*, and *myria*, and the subdivision by *deci*, *centi*, and *milli*. The units in general use are as follows:—

MEASURES OF LENGTH (UNIT METRE).

Equal to	Metre.	Inches.	Feet.	Yards.	Mill.
Millimetre	0.001	0.039	0.003	0.001	0.00
Centimetre	0.010	0.393	0.032	0.010	0.000
Metre	1.000	39.370	3.280	1.093	0.000
Kilometre	1000.000	39370.790	3280.899	1093.633	0.62

CUBIC, OR MEASURES OF CAPACITY (UNIT LITRE).

Equal to	Cubic inches.	Cubic feet.	Pints.	Gallons.
Cubic Centimetre	10.061	0.000	0.001	0.000
Litre, or cubic decimetre	61.027	0.035	1.760	0.220
Cubic Metre	61027.051	35.316	1760.773	220.096

MEASURES OF WEIGHT (UNIT GRAMME).

Equal to	Grains.	Avoirdupois lb.	Cwt. = 112 lb.	Tons = 20 cwt.
Milligramme	0.015	0.000	0.000	0.0000
Gramme	15.432	0.002	0.000	0.0000
Kilogramme	15432.348	2.204	0.019	0.0009
Tonne = 1,000 kilogs.	—	2204.000	19,678	0.9839

SQUARE OR SURFACE MEASURE.

Equal to	Square feet.	Square yards.
Square Metre	10.7643	1.196
Hectare = 10,000 sq. met. = 11,960 sq. yds. = 2.47 acres.		

The Metric System of Weights and Measures, which, as plainly demonstrated in the preceding pages, is logically symmetrical, now forms the usual standard in the following countries :—

* Argentine Republic.	Egypt.	* Peru.
Austria-Hungary.	France.	Portugal.
Belgium.	German Empire.	† Roumania.
* Bolivia.	† Greece.	Servia.
* Brazil.	Holland.	* Spain.
* Chile.	Italy.	Sweden.
* Colombia.	* Mexico.	
Denmark.	Norway.	

The following countries have not adopted the Metric System :—

CANADA.—The legal Weight and Measures are the Imperial Yard, Imperial pound avoirdupois, Imperial gallon, and the Imperial bushel. By Act 42 Vict., Cap. 16, the British hundredweight of 112 pounds and the ton of 2,240 pounds were abolished, and the hundredweight was declared to be 100 pounds, and the ton 2,000 pounds avoirdupois as in United States, but sometimes contracts stipulate for the British weights.

CHINA.—

Weights— 10 Ch'ien = 1	Liang (Tael) = 1.333 oz. avoirdupois or 37.78 grammes
16 Liang = 1	Kin (Catty) = 1.333 lb. avoirdupois or 604.53 grammes
100 Chin = 1	Tan (Picul) = 133.333 lb. avoirdupois or 60.453 kilogrammes
4 ozs. = 3 taels ; 1 lb. = $\frac{3}{4}$ catty or 12 taels ; 1 cwt. = 84 catties ; 1 ton = 16 piculs 80 catties	

Capacity—10 Ko	= 1 Sheng (pint) = 1.031 litre.
10 Sheng	= 1 Tou (peck) = 10.31 litre (holding from 6½ to 10 Kin of rice and measuring from 1.13 to 1.63 gallon)

Commodities, even liquids, such as oil, spirits, etc., are commonly bought and sold by weight.

* Old Spanish measures also occasionally used are :—

Onza	= 1.014 ounce avoirdupois.
Libra	= 1.014 lb. avoirdupois.
Quintal	= 101.44 lb. avoirdupois.
Arroba (of 25 libras)	= 25.36 lb. avoirdupois.
Arroba of Wine	= 6.70 Imperial gallons.
Gallon	= 0.74 Imperial gallon.
Vara	= 0.927 yard.
Square Vara	= 0.859 square yard.

† Turkish measures are also in use :—

Oke of 410 drams	= 2.8283 lb. avoirdupois
Almud	= 1.151 Imperial galls.
Kileh	= 0.9120 Imperial gallon
44 okes = 1 Cantar	= 124.3616 lb. avoirdupois
39.6263 okes	= 1 cwt.
130 okes = 1 Tcheke	= 509.095 pounds.
1 kileh = 20 okes	= 0.36 Imperial qtr.
816 kilehs	= 100 Imperial qtrs.

Length—10 Fen	= 1 T'sun (inch)
10 T'sun	= 1 Chi'h (foot) = 14.1 English inches by treaty
10 Chi'h	= 1 Chang = 11 ft. 9 in. (141 in. by treaty)
1 Li	= $\frac{1}{2}$ English mile (about)

The mow, the unit of measurement, is almost exactly one-sixth of an acre. In the tariff settled by treaty between Great Britain and China, the Chi'h of 14 $\frac{1}{10}$ English inches has been adopted as the legal standard. The standards of weight and length vary all over the Empire, the Chi'h ranging from 9 to 16 English inches, and the Chang (= 10 Chi'h) in proportion; at the treaty ports, the use of foreign treaty standard of Chi'h and Chang is common.

In October, 1907, a decree for uniform weights and measures was issued, making the K'up'ing or Treasury Scale the standard weight. The K'up'ing tael or ounce weighs 575.64 grains. The Haikwan tael weighs 581.47 grains.

INDIA.—The Maund of Bengal.

40 Seers	= 82 $\frac{1}{2}$ lb. avoirdupois
The Maund of Madras ..	= 25 lb. avoirdupois (nearly)
The Tola	= 180 grains troy
The Guz of Bengal ..	= 36 inches

An Act to provide for the adoption of a uniform system of weights and measures was passed in 1871. The Act orders: "Art. 2. The primary standard of weight shall be called a seer, and shall be a weight of metal in the possession of the Government of India, equal, when weighed in a vacuum, to the weight known in France as the kilogramme = 2.205 lb. avoirdupois." "Art. 3. The Units of weight and measures of capacity shall be, for weights, the said seer; for measures of capacity, a measure containing one such seer of water at its maximum density, weighed in a vacuum. Unless it be otherwise ordered, the subdivisions of all such weights and measures of capacity shall be expressed in decimal parts." This Act, however, has never been in operation.

JAPAN—

The Mommé	= 2.11 drams or 2.41 dwts. or 120 mommé = 1 lb. avoirdupois
The Kin (Catty) = 160 mommé	= 1.322 lb. avoirdupois (0.266 mommé = 1 gramme) or 1.60 lb. troy
The Picul (100 kin)	= 132.27 lb.
The Kwan = 1,000 mommé ..	= 8.261 lb. avoirdupois or 10.04 lb. troy
The Shaku	= 0.994 foot (3.3 shaku = 1 metre)
The Kujira Shaku	= 1.242 feet
The Sun	= 1.193 inches
The Ken = 6 Shaku	= 5.965 feet
The Jo = 10 Shaku	= 9.942 feet
The Chô = 60 Ken	= 357.916 feet, or about $\frac{1}{3}$ mile
The Ri = 36 Chô	= 2.44 miles
The Ri (marine)	= 1.15 mile
The Ri (square)	= 5.9552 square miles
The Chô = 10 tan	= 2.45 acres
The Koku, Liquid = 10 To = 100 Sho	= 39.7033 gallons
The Koku, Dry	= 4.9629 bushels
The Koku (capacity of vessel)	= $\frac{1}{10}$ ton
The To, Liquid	= 3.9703 gallons
The To, Dry	= 1.9851 peck

RUSSIA.—

1 Verst (500 sajènes)	.. ..	= 3,500 feet, or two-thirds of a statute mile
1 Sajène (3 arshins)	.. ..	= 7 feet
1 Arshin (16 vershok)	.. ..	= 28 inches
1 Square Verst	.. ..	= 0.43941 square mile
1 Dessiatine	.. ..	= 2.69972 acres
1 Pound (96 zolotniks = 32 lot)	.. ..	= $\frac{9}{16}$ of a pound or 14.4 ounces
1 Pood (40 pounds)	.. ..	= 36.113 lb. = 0.32244 cwt. or 100 poods = 1.6121 tons. Baltic Freight is usually quoted per ton of 62 poods
1 Vedro (8 shtoffs)	.. ..	= 2 $\frac{1}{4}$ Imperial gallons
1 Chetvert (8 chetveriks)	.. ..	= 5.77 Imperial bushels or 46.2 gals.

UNITED STATES.—

British weights and measures are usually employed, but the old Winchester gallon and bushel are used instead of the new or Imperial standards. Different States have a legal standard for bushels of certain articles, such as grain and potatoes, varying from 60 lb. for wheat to 32 for oats.

Wine gallon	.. ..	= 0.83333 gallon
Ale gallon	.. ..	= 1.01695 gallon
Bushel	.. ..	= 0.9692 Imperial bushel
Instead of the British cwt. a central of 100 lb. is used. 1 ton = 2,000 lb., except coal, which is usually 2,240 lb. wholesale.		

NAUTICAL MEASURES

(From "Lloyd's Calendar," by permission of the Committee of Lloyd's.)

12 inches	.. ..	= 1 foot	6 feet	.. ..	= 1 fathom
3 feet	.. ..	= 1 yard	3 nautical miles	.. ..	= 1 league

Sea or Nautical Mile—one-sixtieth of a degree of latitude, and varies from 6,046 ft. on the Equator to 6,092 ft. in lat. 60°

Nautical Mile for speed trials, generally called the Admiralty Measured Mile	{	6,080 feet
		1.151 statute miles
		1,853 metres

Cable's length= the tenth of a nautical mile; or, approximately, 100 fathoms or 200 yards.

A Knot—a nautical mile an hour, is a measure of speed, but is not infrequently, though erroneously, used as synonymous with a nautical mile.

Length of European Measures of Distances compared with the Nautical Mile of 6,080 ft.

	Length in Nautical Miles.		Length in Nautical Miles.
Nautical Mile	1.000	German Ruthen	4.064
British Statute Land Mile	0.868	Italian Mile	1.000
Austrian Mile	4.094	Norwegian Mile	6.097
Danish Mile	4.064	Russian Verst	0.576
French Kilometre	0.539	Swedish Mile	5.769
German Geographical Mile	4.000		

DISTANCE OF HORIZON AT SEA.

Let h be the height of the observer's eye above sea level, D the distance to the horizon, and R the earth's radius.

Then

$$D^2 = 2Rh$$

And thus D in statute miles $= 1.22 \sqrt{h}$ in feet

D in kilometres $= 2.52 \sqrt{h}$ in metres

An object of height h^1 is seen by an eye at height h at a distance D^1 given by

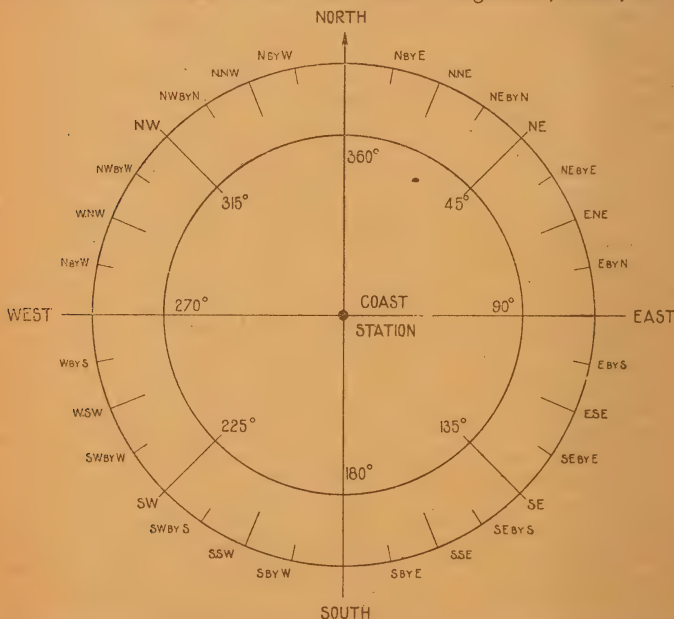
D^1 in statute miles $= 1.22 \sqrt{h}$ in feet $+ \sqrt{h^1}$ in feet

D^1 in kilometres $= 2.52 \sqrt{h}$ in metres $+ \sqrt{h^1}$ in metres

The distance of the horizon—i.e., the greatest distance at which the surface of the sea is visible—varies somewhat with refraction in the atmosphere.

METHOD OF DENOTING THE TRUE BEARING AND COURSE OF A SHIP AT SEA

As regards the true bearing of the ship from the coast station, the degrees are reckoned "clockwise" from north round through east, south, and west



Thus, if the ship's *bearing* from the coast station is anything between north and east, the number to be signalled will be between 0 and 90.

Between east and south the number will be between 90 and 180.

Between south and west the number will be between 180 and 270.

Between west and north the number will be between 270 and 360.

Similarly, if the ship's *course* is between N. and E. the number to be signalled will be between 0 and 90.

Between E. and S. the number to be signalled will be between 90 and 180.

Between S. and W. the number to be signalled will be between 180 and 270.

Between W. and N. the number to be signalled will be between 270 and 360.

To facilitate the conversion of the bearing and course into the number of degrees to be signalled, a table is appended in which either the bearing of the ship from the coast station, or the bearing of the coast station from the ship can be ascertained and the number of degrees to be signalled seen at a glance. The course must be looked for in the same column as the bearing of the ship from the coast station.

Thus a ship 150 miles bearing S 75° W. from a coast station and steaming S. 85° E. at 15 knots, and having telegrams comprising 75 words to send, on receiving the signal to Go (— • —) from the coast station, would signal the following:—

— • — • — XYZ — • • • ABC — 150 255
 95 15 75 • — • — • (end).

TABLE TO CONVERT BEARING AND COURSE INTO DEGREES.

Course of Bearing of Ship from Coast Station.	Bearing of Coast Station from Ship.	Degrees to be Signalled.
North	South	0°
N. 10° E.	S. 10° W.	10°
20°	20°	20°
30°	30°	30°
40°	40°	40°
50°	50°	50°
60°	60°	60°
70°	70°	70°
80°	80°	80°
East	West	90°
S. 80° E.	N. 80° W.	100°
70°	70°	110°
60°	60°	120°
50°	50°	130°
40°	40°	140°
30°	30°	150°
20°	20°	160°
10°	10°	170°
South	North	180°
S. 10° W.	N. 10° W.	190°
20°	20°	200°
30°	30°	210°
40°	40°	220°
50°	50°	230°
60°	60°	240°
70°	70°	250°
80°	80°	260°
West	East	270°
N. 80° W.	S. 80° E.	280°
70°	70°	290°
60°	60°	300°
50°	50°	310°
40°	40°	320°
30°	30°	330°
20°	20°	340°
10°	10°	350°
North	South	360° or 0

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS.—I.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4
	0.0	0.00	0.07	0.31	0.03	0.62	0.07	0.94	0.12	1.25
1	0.78	3.14	0.95	3.45	0.13	3.77	1.32	4.08	1.53	4.39
2	3.14	6.28	3.46	6.59	3.80	6.91	4.15	7.22	4.52	7.53
3	7.06	9.42	7.54	9.74	8.04	10.05	8.55	10.36	9.07	10.68
4	12.56	12.56	13.20	12.88	13.85	13.19	14.52	13.50	15.20	13.82
5	19.63	15.70	20.42	16.02	21.23	16.33	20.06	16.65	22.90	16.96
6	28.27	18.84	29.22	19.16	30.19	19.47	31.17	19.79	32.16	20.10
7	38.48	21.99	39.59	22.30	40.71	22.61	41.85	22.93	43.00	23.24
8	50.26	25.13	51.53	25.44	52.81	25.76	54.10	26.07	55.41	26.38
9	63.61	28.27	65.03	28.58	66.47	28.90	67.92	29.20	69.30	29.53
10	78.53	31.41	80.11	31.73	81.71	32.04	83.32	32.35	84.94	32.67

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS.—II.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
0	0·5	0·5	0·6	0·6	0·7	0·7	0·8	0·8	0·9	0·9
1	0·19	1·57	0·28	1·88	0·38	2·19	0·50	2·51	0·63	2·82
2	1·76	4·71	2·01	5·02	2·26	5·34	2·54	5·65	2·83	5·96
3	4·90	7·85	5·30	8·16	5·72	8·48	6·15	8·79	6·60	9·11
4	9·62	10·99	10·17	11·30	10·75	11·62	11·34	11·93	11·94	12·25
5	15·90	14·13	16·61	14·45	17·34	14·76	18·09	15·08	18·85	15·39
6	23·75	17·37	24·63	17·59	25·51	17·90	26·42	18·22	27·33	18·53
7	33·18	20·42	34·21	20·73	35·25	21·04	36·31	21·36	37·39	21·67
8	44·17	23·56	45·36	23·87	46·56	24·19	47·78	24·50	49·01	24·81
9	46·74	26·70	58·08	27·01	59·44	27·33	60·82	27·64	62·21	27·96
10	70·88	29·84	72·38	30·15	73·89	30·47	75·42	30·78	76·97	31·10
	86·59	32·98	88·24	33·30	89·92	33·61	91·60	33·92	93·31	34·24

LENGTH OF A DEGREE IN LATITUDE AND LONGITUDE.

Lat.	Degree of Longitude.		Degree of Latitude.		Lat.	Degree of Longitude.		Degree of Latitude.	
	Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.		Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.
0	69·160	60·000	68·698	59·600	45	48·986	42·498	69·044	59·899
2	0·119	59·964	0·699	0·601	47	47·251	40·993	0·068	0·920
4	68·992	0·855	0·702	0·603	49	45·459	39·439	0·092	0·941
6	0·783	0·673	0·706	0·607	51	43·611	37·835	0·116	0·962
8	0·491	0·419	0·712	0·612	53	41·710	36·186	0·140	0·982
10	0·116	0·093	0·719	0·618	55	39·758	34·491	0·162	60·002
12	67·659	58·697	0·728	0·625	57	37·756	32·755	0·185	0·022
14	0·120	0·229	0·738	0·634	59	35·707	30·979	0·206	0·041
16	66·499	57·690	0·750	0·645	61	33·615	29·164	0·228	0·059
18	65·797	0·081	0·764	0·657	63	31·481	27·311	0·248	0·077
20	0·015	56·404	0·779	0·669	65	29·308	25·425	0·268	0·094
22	64·154	55·657	0·795	0·683	67	27·100	23·509	0·286	0·110
24	63·216	54·843	0·813	0·699	69	24·857	21·564	0·302	0·124
26	62·201	53·962	0·831	0·715	71	22·582	19·593	0·318	0·137
28	61·110	0·016	0·850	0·731	73	20·282	17·597	0·333	0·149
30	59·944	52·005	0·870	0·749	75	17·956	15·578	0·345	0·161
32	58·706	50·931	0·892	0·767	77	15·607	13·539	0·357	0·171
34	57·396	49·794	0·914	0·786	79	13·238	11·484	0·367	0·179
36	56·016	48·597	0·936	0·806	81	10·853	9·417	0·375	0·186
38	54·568	47·340	0·959	0·826	83	8·456	7·338	0·381	0·192
40	53·053	46·026	0·983	0·846	85	6·048	5·248	0·387	0·196
42	51·473	44·656	69·007	0·866	87	3·632	3·151	0·390	0·199
44	49·830	43·231	0·013	0·888	89	1·211	1·050	0·392	0·201

MEASURES OF TIME

The earth's axial rotation is the phenomenon by which time is measured everywhere on the earth's surface. Experiment and observation show that if we assume the earth to rotate uniformly, there are many other phenomena which are as accurately isochronous in their periodicity. That is to say, they pass again and again through all their phases in exactly the same interval of time as measured in terms of the earth's rotation. In the pendulum of a clock and the balance wheel of a watch we have such isochronism very approximately realised. A little consideration will convince us that the measurement of time is really a comparison of periodic sequences. We cannot conceive any other mode of marking off time intervals than by some kind of motion of a periodic character. Our practical unit of time is essentially terrestrial.

SIDEREAL DAY.—The standard unit of time is the **SIDEREAL DAY**, being the period in which the earth turns once round on its axis. It is divided into sidereal hours, minutes, and seconds.

MEAN SOLAR TIME.—A **SECOND** is the time of one swing of a pendulum adjusted so as to make 86,164·09 swings in a sidereal day. Seconds are usually subdivided decimally.

One **MEAN SOLAR DAY** = 24 hours = 1,440 minutes = 86,400 seconds = 1·00273791 sidereal day.

RELATION BETWEEN TIME AND LONGITUDE.—At any given instant the mean solar time at two stations differ by an amount proportional to their difference of longitude, the time at the eastern station being the earlier.

CORRESPONDING DIFFERENCES.			
Longitude.	Time.	Longitude.	Time.
15"	1 second.	75°	5 hours.
1'	4 seconds.	90	6 "
15'	1 minute.	105	7 "
1°	4 minutes.	120	8 "
15°	1 hour.	135	9 "
30	2 hours.	150	10 "
45	3 "	165	11 "
60	4 "	180	12 "

To show the exact date of any event, the meridian at which the time is reckoned must be specified. One degree longitude at Equator=60 nauts. 69.17 statute miles.

STANDARD OR ZONE TIME.

Country.	Central Meridian.	Fast or Slow on Greenwich Time.*
Western Europe, Algeria	0°	Greenwich Time
Central Europe, Tunis, Congo, Angola, South-West Africa	15° E.	1 h. fast
Eastern Europe, British South Africa, Egypt, Portuguese East Africa	30° E.	2 h. fast
Mauritius, Reunion and Seychelles	60° E.	4 h. fast
India (except Calcutta) and Ceylon	82½° E.	5½ h. fast
Calcutta	90° E.	6 h. fast
Burmah	97½° E.	6½ h. fast
Federated Malay States, Straits Settlements, and French Indo-China	105° E.	7 h. fast
Java	100° 48' 37.5" E.	7 h. 19 m. 14.5 s. fast
Western Australia, Hong-Kong, East Coast of China, Kiau Chau, Philippine Islands, British North Borneo, Labuan	120° E.	8 h. fast
Korea	127° 30' E.	8½ h. fast
Japan, Seoul, and Chemulpo	135° E.	9 h. fast
South Australia and Guam	142° 30' E.	9½ h. fast
New South Wales, Queensland, Tasmania, Victoria, New Guinea, and Caroline Islands	150° E.	10 h. fast
New Zealand	174½° E.	11½ h. fast
Ascension	14° 15' W.	57 m. slow
Iceland, Madeira, Liberia and Portuguese Guinea	15° W.	1 h. slow
America:		
Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, Grenada, Trinidad, etc.)	60° W.	4 h. slow
Eastern (Eastern U.S., Chili, Panama, Peru, etc.)	75° W.	5 h. slow
Central	90° W.	6 h. slow
Mountain	105° W.	7 h. slow
Pacific (British Columbia, etc.)	120° W.	8 h. slow
Alaska	135° W.	9 h. slow
Hawaii or Sandwich Islands	157° 30' W.	10½ h. slow
Samoa	172½° W.	11½ h. slow

BELL TIME ON BOARD SHIP.

The nautical day begins at noon and is divided into "watches" of four hours each, time being indicated by bells striking every half-hour.

A.M.	A.M.	A.M.		P.M.	P.M.	P.M.
12.30	4.30	8.30....1	BELL....	12.30	4.30	8.30
1.00	5.00	9.00....2	BELLS....	1.00	5.00	9.00
1.30	5.30	9.30....3	BELLS....	1.30	5.30	9.30
2.00	6.00	10.00....4	BELLS....	2.00	6.00	10.00
2.30	6.30	10.30....5	BELLS....	2.30	6.30	10.30
3.00	7.00	11.00....6	BELLS....	3.00	7.00	11.00
3.30	7.30	11.30....7	BELLS....	3.30	7.30	11.30
4.00	8.00	NOON....8	BELLS....	4.00	8.00	MIDNIGHT.

* Greenwich time is used in France, Spain, Portugal, Belgium, Gibraltar, and the Faroes.

One of these four-hour watches is divided into two "dog watches":—

(1) From 4 to 6 p.m.

(2) From 6 to 8 p.m.

The hours for the "dog watches" are:—

4 BELLS.....	6.00 p.m.
1 BELL	6.30 p.m.
2 BELLS.....	7.00 p.m.
3 BELLS.....	7.30 p.m.

INDUCTANCE OF SINGLE LAYER COILS

$$L = \pi d^2 n^2 l k$$

l = Inductance in cms.

d = Diameter of coil.

n = Number of turns per cm.

k = Factor which depends on the ratio of the diameter to the length of the coil.

If the total number of turns of wire are used instead of the number of turns per cm. the formula may be written

$$L = \frac{\pi^2 d^2 n^2 K}{I.}$$

Where N is the total number of turns.

The total length of wire in the coil is πdn , so that a third form is

$$L = \frac{x^2}{I.} K.$$

Where $x = \pi dn$.

The values of k , for the ratio of length to diameter of the coil between 0.01 and 10 have been calculated by Prof. Nagaoka. The values are given in the table:

INDUCTANCE AND CAPACITY. TABLE I.

d.	K.	d.	K.
0.00	1.000	0.70	0.7609
0.02	0.9916	0.72	0.7556
0.04	0.9832	0.74	0.7504
0.06	0.9750	0.76	0.7452
0.08	0.9668	0.78	0.7401
0.10	0.9588	0.80	0.7351
0.12	0.9509	0.82	0.7301
0.14	0.9430	0.84	0.7252
0.16	0.9353	0.86	0.7205
0.18	0.9276	0.88	0.7157
0.20	0.9201	0.90	0.7110
0.22	0.9126	0.92	0.7063
0.24	0.9053	0.94	0.7018
0.26	0.8980	0.96	0.6972
0.28	0.8909	0.98	0.6928
0.30	0.8838	1.00	0.6884
0.32	0.8767	1.20	0.6475
0.34	0.8699	1.40	0.6115
0.36	0.8632	1.60	0.5795
0.38	0.8565	1.80	0.5511
0.40	0.8499	2.00	0.5255
0.42	0.8433	2.2	0.5025
0.44	0.8366	2.4	0.4816
0.46	0.8306	2.6	0.4626
0.48	0.8243	2.8	0.4452
0.50	0.8181	3.0	0.4292
0.52	0.8120	3.5	0.3944
0.54	0.8060	4.0	0.3654
0.56	0.8001	4.5	0.3400
0.58	0.7943	5.0	0.3198
0.60	0.7885	6.0	0.2854
0.62	0.7828	7.0	0.2584
0.64	0.7772	8.0	0.2366
0.66	0.7717	9.0	0.2185
0.68	0.7663	10.0	0.2033

For making approximate calculations of the inductance of a coil, Table 2 has been worked out. This table gives the inductance of coils of diameters ranging from 4 to 18 cms. in diameter, and from 1 to 34 cms. long.

The inductance given is for a winding of 10 turns per centimetre. For other windings the values given in the table should be multiplied by $\frac{N^2}{100}$ where N is the number of turns per centimetre.

In Table 3 are given the number of turns per centimetre for coils wound with various covered wires. These figures have been worked out from the diameters given in the catalogue of a leading wire manufacturer, and in many cases checked on actual coils. They must, however, be regarded as approximate only, since the number of turns per centimetre depends on the skill of the winder and the overall dimensions of the covered wire, which is not absolutely constant.

Subject to these limitations the table will be found to give very good results for approximate work.

INDUCTANCE OF A COIL WOUND WITH 10 TURNS PER CENTIMETRE.

DIAMETER IN CENTIMETRES.

Length in cms.	4	5	6	7	8	9
1	5.78	7.89	10.14	12.49	14.94	17.47
2	16.59	23.28	30.5	38.1	46.2	54.5
3	29.5	42.25	56.02	70.87	86.57	97.15
4	43.4	63.0	84.57	107.9	132.8	159.0
5	58.0	84.92	115.0	147.6	179.6	220.3
6	72.9	107.6	146.7	190.2	236.2	300.2
7	87.9	130.7	179.3	233.1	291.2	353.7
8	103.3	154.2	212.5	277.2	348.0	423.7
9	118.7	177.8	246.1	322.7	406.0	470.5
10	134.2	201.8	280.0	368.0	464.5	568.5
12	165.2	249.3	348.7	460.5	586.0	717.5
14	196.4	298.2	418.2	554.0	702.5	868.7
16	227.7	347.2	478.8	648.2	825.2	1023
18	259.0	395.7	557.8	743.0	950.0	1178
20	290.5	444.7	628.0	838.0	1074	1333
22	321.7	493.7	698.5	933.5	1205	1490
24	353.5	543.0	751.2	1038.7	1322	1647
26	384.0	591.7	889.2	1125	1447	1845
28	416.5	641.2	910.5	1221	1572	1961
30	448.0	690.2	980.5	1316	1697	2120
32	480.0	739.5	1052	1413	1822	2278
34	511.0	788.7	1122	1509	1948	2380

Length in cms.	10	12	14	16	18
1	20.06	—	—	—	—
2	63.1	81.12	99.7	119.5	139.7
3	120.0	155.8	196.0	233.0	273.7
4	186.3	243.5	305.2	369.5	436.0
5	259.2	342.2	430.7	502.3	620.5
6	337.5	448.2	567.5	698.7	823.7
7	420.2	560.7	711.7	873.2	1046
8	504.0	676.7	863.5	1062	1278
9	590.5	800.7	1020	1256	1512
10	679.5	920.2	1181	1464	1762
12	860.7	1175	1518	1886	2283
14	1046	1435	1862	2320	2822
16	1234	1701	2219	2785	3400
18	1424	1970	2577	3245	3962
20	1615	2241	2945	3715	4547
22	1807	2515	3312	4187	5140
24	2000	2790	3682	4667	5735
26	2194	3067	4057	5152	6342
28	2421	3347	4432	5637	6952
30	2582	3625	4807	6125	7565
32	2778	3905	5187	6615	8182
34	2982	4187	5565	7162	8800

SINGLE-LAYER COILS.

S.W.G. 1	Diameter in millimetres. 2	Single silk covered.			Double silk covered.		
		Turns per centimetre. 3	Relative inductance. 4	Direct Current resistances. 5	Turns per centimetre. 6	Relative inductance 7	Direct Current resistance. 8
40	0.122	62.2	9.67	28.4	55.9	7.81	25.5
39	0.132	58.8	8.64	22.9	52.8	6.97	20.5
38	0.152	52.3	6.84	15.3	47.6	5.66	13.9
37	0.173	47.5	5.63	10.8	43.5	4.74	9.90
36	0.193	43.3	4.69	7.89	40.0	4.00	7.29
35	0.213	40.0	4.00	5.96	36.1	3.26	5.38
34	0.234	36.8	2.39	4.57	33.6	2.82	4.18
33	0.254	33.2	2.75	3.49	31.5	2.48	3.31
32	0.274	32.0	2.56	2.91	29.6	2.19	2.67
31	0.295	30.0	2.24	2.35	27.9	1.94	2.18
30	0.315	28.2	1.99	1.93	25.5	1.63	1.74
29	0.345	25.8	1.66	1.47	23.7	1.40	1.35
28	0.376	23.9	1.43	1.15	22.1	1.22	1.06
27	0.417	21.8	1.19	0.853	20.3	1.03	0.794
26	0.457	20.0	1.00	0.649	18.7	0.874	0.607
25	0.508	18.2	0.828	0.478	17.1	0.731	0.449
24	0.559	16.7	0.697	0.363	15.7	0.616	0.341
23	0.610	15.2	0.578	0.277	14.3	0.511	0.261
22	0.711	13.2	0.436	0.177	12.8	0.410	0.171
21	0.813	11.6	0.337	0.115	11.1	0.308	0.114
20	0.914	10.35	0.268	0.0840	9.9	0.245	0.0803
19	1.016	9.37	0.219	0.0616	9.05	0.205	0.0595
18	1.219	7.87	0.155	0.0359	7.64	0.146	0.0349
17	1.422	6.87	0.118	0.0231	6.50	0.106	0.0218
16	1.626	5.87	0.086	0.0151	6.75	0.083	0.0148
15	1.829	5.23	0.068	0.0106	5.16	0.066	0.0105
14	2.032	4.76	0.057	0.00782	4.65	0.054	0.0076
13	2.337	4.13	0.043	0.00513	4.09	0.040	0.00508
12	2.642	3.68	0.034	0.0036	3.66	0.033	0.0036

Columns 4 and 7 give the ratio of inductance of a coil wound with the given wire to that of a similar coil wound with 20 turns per centimetre (Table 2).

The resistances in columns 5 and 8 are for a length of 1 centimetre winding on a coil of 10 cms. diameter.

Enamelled wire has approximately the same dimensions as single silk covered in the smaller gauges.

COIL OF MAXIMUM INDUCTANCE.

In winding an inductance it is desirable in most cases to make its resistance as small as possible, since in this case the length of wire will also be a minimum. It is not possible to give a single formula for winding the dimensions of a coil with maximum inductance in every case, since the value of the inductance depends on the correction terms for thickness of insulation, etc. The original formula given by Maxwell is that if the section of the coil is square the maximum inductance is obtained when the mean diameter of the coil is 3.7 times the side of the square.

In a recent article Messrs. Shawcross & Wells have given curves of the inductance obtained for a wire 1 mm. in diameter and 1570.8 (500 π) metres long, coiled up in different forms. The coil of maximum inductance for a square section coil is that from the curves with diameter about three times the side of the square.

The square section coil has a greater inductance than coils of other ratios of width b to depth c .

Thus the inductance for the square section coil is 1.29 henrys (approx.).

For a ratio $\frac{b}{c} = 2$ the maximum inductance is 1.24 henrys and is for a ratio $\frac{d}{b}$ about 2.3.

For $\frac{b}{c} = 5$ max. inductance = 1.07 henrys; for $\frac{d}{b} = 1.5$.

Dr. A. Russell has pointed out that for maximum possible inductance from a given length of wire the section of the coil should be circular, and with a ratio $a = 2.575r$, where a is the radius of the circular axis of the coil, and r is the radius of the cross-section.

The inductance is

$$L = 5.35\pi N^2 a \times 10^{-9} \text{ henrys.}$$

where N = total number of turns.

For a single-layer coil for the case where the turns are close-wound the coil of maximum inductance is given by $\frac{\text{diameter}}{\text{breadth}} = 2.415$.

This can be seen by plotting a curve of the inductance as calculated by Nagaoka's formula.

When the coil is wound with spaced windings the inductance will depend on the spacing, and therefore it must be worked out for any particular case from the formulas given.

INDUCTANCE OF COILS WITH IRON CORES.

The formulas for inductance given in the previous formulas have been for coils without magnetic cores.

The inductance of these coils depends principally on the geometrical dimensions, with a small correction factor depending on the frequency of the current, so that there are formulas available for every possible case, many being of the highest accuracy.

For coils with iron cores, however, the inductance depends on the physical properties of the core as well as the dimensions of the coil, and these properties are variable. The flux density B , which is induced in a sample of iron by a magnetising force H , is given by relationship

$$B = \mu H$$

where μ is the permeability.

Now, μ is not a constant for any one sample, but varies in a complex manner with H and also varies within wide limits for different samples of iron.

The inductance of an iron core coil, therefore, depends on the permeability of the iron, and this varies over the cross-section of the core, since H is not constant over the area. Moreover, if the current in the coil (by which H is produced) varies, the value of μ will change.

It is, therefore, only possible to select some average value for μ which can be taken by experience to give a representative value for the particular coil in question.

Where the coil is in such a form that the iron forms are nearly closed circuit with a relatively small air gap, a convenient formula is

$$L \text{ (henrys)} = \frac{0.4N^2\mu A}{l}$$

in which μ is the permeability of the air gap ($\mu = 1$). l is the length of the air gap in centimetres, A is the cross-section normal to the flux at the gap (the area of the surface of the iron core at the air gap), N is the total number of turns on the coil.

For an open-core coil a similar formula which may be used is

$$L = \frac{N^2 A \mu}{l} k$$

where N = total number of turns, l = length of the iron core, A = cross-section of the core μ = the permeability of the value of H at the centre of the core, and k is a factor to be determined by experiment or from previous data to allow for the effect of the ends. The area A is strictly of that of the iron in the core after allowing for air spaces or insulation between the strips or wires of which the iron is composed, but if the same iron be used for various coils, the outside area of the core is taken from the difference allowed for in k .

CALCULATION OF CAPACITY.

The capacities given by the following formulas are in microfarads. The farad is 10^{-9} of the cgs. electromagnetic unit and is defined as the capacity of a condenser charged to a potential of 1 volt by 1 coulomb of electricity. In the formulas here given all lengths are expressed in centimetres and all areas in square centimetres.

PARALLEL PLATE CONDENSER.

Let S = surface area of one plate.

r = thickness of the dielectric.

K = dielectric constant ($K = 1$ for air).

$$C = 0.0885 K \frac{S}{r} \text{ microfarads.}$$

If, instead of a single pair of metal plates, there are N similar plates the dielectric between, alternate plates being connected in parallel,

$$C = 0.0885 K \frac{(N-1) S}{r}$$

In these formulas no allowance is made for the curving of the lines of force at the edges of the plates; the effect is negligible where r is very small compared with S .

VARIABLE CONDENSER WITH SEMI-CIRCULAR PLATES.

Let N = total number of parallel plates.

r_1 = outside radius of the plates.

r_2 = inner radius of plates.

r = thickness of dielectric

K = dielectric constant.

Then, for the position of maximum capacity (movable plates between fixed plates).

$$C = 0.1390 K \frac{(N-1) (r_1^2 - r_2^2)}{r}$$

This formula does not take into account the effect of the edges of the plates, but as the capacity is also affected by the containing case it will not generally be worth while to take the edge effect into account.

WAVELENGTH AND FREQUENCY OF RESONANCE.

$$\lambda_{cm} = 1.8838 \times 10^{11} \sqrt{LC} \text{ (cgs. electromagnetic units).}$$

$$= 6.283 \sqrt{L \text{ cgs. electromagnetic } C \text{ cgs. electrostatic.}}$$

$$\lambda_m = 0.05957 \sqrt{L \text{ cgs. electromagnetic } C \text{ micromicrofarad.}}$$

$$= 1.884 \sqrt{L \text{ microhenry } C \text{ micromicrofarad.}}$$

$$= 1884 \sqrt{L \text{ microhenry } C \text{ microfarad.}}$$

$$= 59570 \sqrt{L \text{ millihenry } C \text{ microfarad.}}$$

$$= 1884000 \sqrt{L \text{ henry } C \text{ microfarad.}}$$

$$f = \frac{159.2}{\sqrt{L \text{ henry } C \text{ microfarad.}}}$$

$$= \frac{5033}{\sqrt{L \text{ millihenry } C \text{ microfarad.}}}$$

$$= \frac{159200}{\sqrt{L \text{ microhenry } C \text{ microfarad.}}}$$

$$\omega = \frac{1000}{\sqrt{L \text{ henry } C \text{ microfarad.}}}$$

$$= \frac{31620}{\sqrt{L \text{ millihenry } C \text{ microfarad.}}}$$

$$= \frac{1,000,000}{\sqrt{L \text{ microhenry } C \text{ microfarad.}}}$$

$$T = \frac{1}{f} = \frac{2\pi}{\omega}$$

$$\lambda_m = \frac{2.998 \times 10^8}{f}$$

$$= \frac{1.884 \times 10^9}{\omega}$$

A.C. IN RESISTANCE, INDUCTANCE AND CAPACITY.

A sine voltage $E \sin \omega t$ produces a current

$$i = \frac{E}{R} \sin \omega t \text{ in a resistance } R$$

$$i = \frac{E}{L\omega} \sin \left(\omega t - \frac{\pi}{2} \right) \text{ in an inductance } L$$

$$i = \frac{E}{1/(C\omega)} \sin \left(\omega t + \frac{\pi}{2} \right) \text{ in a capacity } C$$

the units being a consistent system.

The quantities $L\omega$ and $-1/C\omega$ are called the "Reactance." or sometimes $1/(C\omega)$ is called capacity reactance. The symbol for reactance is X . If a circuit possesses a resistance, an inductance and a capacity acting in series, we have

$$i = \frac{E}{\sqrt{R^2 (L\omega - 1/C\omega)^2}} \sin \left(\omega t - \angle \frac{L\omega - 1/C\omega}{R} \right)$$

The denomination is called the "impedance" of the circuit. Its symbol is Z . Here the reactance $X = L\omega - 1/(C\omega)$, and may be positive or negative.

The current is $i = \frac{E}{Z} \sin \left(\omega t - \angle \frac{X}{R} \right)$

In effective values $A = \frac{V}{Z}$, with lag $\angle \frac{X}{R}$

In the general case with voltage e as given above.

$$\begin{aligned} i = i_0 + \frac{E_1}{Z_1} \sin \left(\omega t + \psi_1 - \angle \frac{X_1}{R} \right) \\ + \frac{E_2}{Z_2} \sin \left(2\omega t + \psi_2 - \angle \frac{X_2}{R} \right) \\ + \frac{E_3}{Z_3} \sin \left(3\omega t + \psi_3 - \angle \frac{X_3}{R} \right) \end{aligned}$$

Where $Z_2 = \frac{+ \text{etc.}}{\sqrt{R^2 + X_2^2}},$

$$X_2 = 2\omega L - 1/2\omega C, \text{ etc.}$$

IMPEDANCES IN SERIES AND PARALLEL.

Let two circuits with impedances Z, Z' be connected in series. The total resistance is $R + R'$, the total reactance is $X + X'$. The latter is an algebraic sum. The total impedance is therefore

$$\sqrt{(R + R')^2 + (X + X')^2}, \text{ with lag } \frac{X + X'}{R + R'}$$

Let the two circuits be connected in parallel. The total impedance is $ZZ' \div \sqrt{(R + R')^2 + (X + X')^2}$

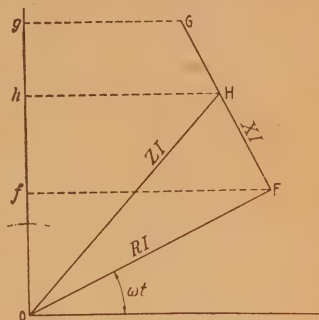
with lag $\angle \frac{X}{R} + \angle \frac{X}{R'} - \angle \frac{X + X'}{R + R'}$

Just as problems on resistances in parallel can be more easily handled by using conductances instead of resistances, so problems on impedances in parallel may be worked by using "admittances," the reciprocals of impedances.

CLOCK DIAGRAMS.

Sine currents and voltages can be represented in a plane by the projection on an axis of vectors whose lengths and directions are chosen to represent magnitudes and phases. If the vectors be supposed to rotate, relatively to the axis, with angular velocity ω , the projections represent the alternating values. These vector figures afford great help in solving such A.C. problems as permit the vectors to lie in one plane. They are called clock diagrams and are usually drawn to represent voltages.

Suppose A.C. of maximum value I to flow in a circuit comprising resistance R , inductance L , capacity C , in series. Set off at any angle, ωt , the vector OF to represent RI to scale. At right angles, and forward, set off FG to denote $L\omega I$ to the same scale. From the end G set off $-I/C\omega$ in the same direction. In effect this subtracts from $L\omega I$, so that FH represents $(L\omega - I/C\omega) I$, or XI , where X is the whole reactance. Join OH . By geometry,



$$OH = \sqrt{R^2 + X^2} \times I = ZI$$

where Z is the impedance of the circuit.

The projections on the upright axis give instantaneous voltages. Thus Of is the instantaneous voltage across the resistance, fg that across the inductance, gh that across the capacity (down means minus), and fh that across the whole reactance, and Oh that at the terminals of the circuit. Thus Oh represents $E \sin \omega t$ to scale. The relative phases of the voltage and current are seen in the relative directions of the vectors OH and OF . The current lags behind the applied E.M.F. by $\angle HF/OF$ — i.e., $\angle X/R$.

By altering the scale in the ratio $\sqrt{2}$ the vectors give directly the effective, instead of the maximum, values of voltage and current.

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS.

No.	Square.	Cube.	Sq. root.	Cube root.
1	1	1	1.0	1.0
2	4	8	1.414	1.259
3	9	27	1.732	1.442
4	16	64	2.0	1.587
5	25	125	2.236	1.709
6	36	216	2.449	1.817
7	49	343	2.645	1.912
8	64	512	2.828	2.0
9	81	729	3.0	2.080
10	100	1,000	3.162	2.154
11	121	1,331	3.316	2.223
12	144	1,728	3.464	2.289
13	169	2,197	3.60	2.35
14	196	2,744	3.74	2.41
15	225	3,375	3.87	2.46
16	256	4,096	4.0	2.51
17	289	4,913	4.12	2.57
18	324	5,832	4.24	2.62
19	361	6,859	4.35	2.66
20	400	8,000	4.47	2.71
21	441	9,261	4.582	2.758
22	484	10,648	4.690	2.802
23	529	12,167	4.795	2.843
24	576	13,824	4.898	2.884
25	625	15,625	5.0	2.92
26	676	17,576	5.099	2.962
27	729	19,683	5.196	3.0

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS—continued.

No.	Square.	Cube.	Sq. root.	Cube root.
28	784	21,952	5.291	3.036
29	841	24,381	5.385	3.072
30	900	27,000	5.47	3.10
31	961	29,799	5.567	3.141
32	1,024	32,768	5.656	3.174
33	1,089	35,937	5.744	3.207
34	1,156	39,304	5.830	3.239
35	1,225	42,875	5.91	3.27
36	1,296	46,656	6.0	3.301
37	1,369	50,653	6.082	3.332
38	1,444	54,872	6.164	3.361
39	1,521	59,319	6.244	3.391
40	1,600	64,000	6.32	3.419
41	1,681	68,921	6.403	3.448
42	1,764	74,088	6.480	3.476
43	1,849	79,507	6.557	3.503
44	1,936	85,184	6.633	3.530
45	2,025	91,125	6.708	3.55
46	2,116	97,336	6.782	3.583
47	2,209	103,823	6.855	3.608
48	2,304	110,592	6.928	3.634
49	2,401	117,649	7.0	3.659
50	2,500	125,000	7.07	3.68
51	2,601	132,651	7.141	3.708
52	2,704	140,608	7.211	3.732
53	2,809	148,877	7.280	3.756
54	2,916	157,464	7.348	3.779
55	3,025	166,375	7.41	3.80
56	3,136	175,616	7.483	3.825
57	3,249	185,193	7.549	3.848
58	3,364	195,112	7.615	3.870
59	3,481	205,379	7.681	3.892
60	3,600	216,000	7.74	3.91
61	3,721	226,981	7.810	3.936
62	3,844	238,328	7.874	3.957
63	3,969	250,047	7.937	3.979
64	4,096	262,144	8.0	4.0
65	4,225	274,625	8.06	4.02
66	4,356	287,496	8.124	4.041
67	4,489	300,763	8.185	4.061
68	4,624	314,432	8.246	4.081
69	4,761	328,509	8.306	4.101
70	4,900	343,000	8.36	4.12
71	5,041	357,911	8.426	4.140
72	5,184	373,248	8.485	4.160
73	5,329	389,017	8.544	4.179
74	5,476	405,224	8.602	4.198
75	5,625	421,875	8.66	4.21
76	5,776	438,976	8.717	4.235
77	5,929	456,533	8.774	4.254
78	6,084	474,552	8.831	4.272
79	6,241	493,039	8.888	4.290
80	6,400	512,000	8.94	4.30
81	6,561	531,441	9.0	4.326
82	6,724	551,368	9.055	4.344
83	6,889	571,787	9.110	4.362
84	7,056	592,704	9.165	4.379
85	7,225	614,125	9.21	4.39
86	7,396	636,056	9.273	4.414
87	7,569	658,053	9.327	4.431
88	7,744	681,472	9.380	4.447
89	7,921	704,969	9.433	4.464
90	8,100	729,000	9.48	4.480
91	8,281	753,571	9.539	4.497
92	8,464	778,688	9.591	4.514
93	8,649	804,357	9.643	4.530
94	8,836	830,584	9.695	4.546
95	9,025	857,375	9.74	4.560
96	9,216	884,736	9.797	4.578
97	9,409	912,673	9.848	4.594
98	9,604	941,192	9.899	4.610
99	9,801	970,299	9.949	4.626
100	10,000	1,000,000	10.00	4.64
105	11,025	1,157,625	10.24	4.718
110	12,100	1,331,000	10.48	4.79
115	13,225	1,520,875	10.72	4.863
120	14,400	1,728,000	10.95	4.93

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS—continued.

No.	Square.	Cube.	Sq. root.	Cube root.
125	15,625	1,953,125	11.18	5.000
130	16,900	2,197,000	11.40	5.06
135	18,225	2,460,375	11.61	5.130
140	19,600	2,744,000	11.83	5.19
150	22,500	3,375,000	12.24	5.31
160	25,600	4,096,000	12.64	5.42
170	28,900	4,913,000	13.03	5.53
180	32,400	5,832,000	13.41	5.64
190	36,100	6,859,000	13.78	5.74
200	40,000	8,000,000	14.14	5.84
210	44,100	9,261,000	14.49	5.94
220	48,400	10,648,000	14.83	6.03
230	52,900	12,167,000	15.16	6.12
240	57,600	13,824,000	15.47	6.21
250	62,500	15,625,000	15.81	6.29
260	67,600	17,576,000	16.12	6.38
270	72,900	19,683,000	16.43	6.46
280	78,400	21,952,000	16.73	6.54
290	84,100	24,389,000	17.02	6.61
300	90,000	27,000,000	17.32	6.69
310	96,100	29,791,000	17.60	6.76
320	102,400	32,768,000	17.88	6.83
330	108,900	35,937,000	18.16	6.91
340	115,600	39,304,000	18.43	6.97
350	122,500	42,875,000	18.70	7.04
360	129,600	46,656,000	18.97	7.11
370	136,900	50,653,000	19.23	7.17
380	144,400	54,872,000	19.49	7.24
390	152,100	59,319,000	19.74	7.30
400	160,000	64,000,000	20.00	7.36
410	168,100	68,921,000	20.24	7.42
420	176,400	74,088,000	20.49	7.48
430	184,900	79,507,000	20.73	7.54
440	193,600	85,184,000	20.97	7.60
450	202,500	91,125,000	21.21	7.66
460	211,600	97,366,000	21.44	7.71
470	220,900	103,823,000	21.67	7.77
480	230,400	110,592,000	21.90	7.82
490	240,100	117,649,000	22.13	7.88
500	250,000	125,000,000	22.36	7.93
510	260,100	132,651,000	22.58	7.98
520	270,400	140,608,000	22.80	8.04
530	280,900	148,877,000	23.02	8.09
540	291,600	157,464,000	23.23	8.14
550	302,500	166,375,000	23.45	8.19
560	313,600	175,616,000	23.66	8.24
570	324,900	185,193,000	23.87	8.29
580	336,400	195,112,000	24.08	8.33
590	348,100	205,379,000	24.29	8.38
600	360,000	216,000,000	24.49	8.43
610	372,100	226,981,000	24.69	8.48
620	384,400	238,328,000	24.90	8.52
630	396,900	250,047,000	25.099	8.572
640	409,600	262,114,000	25.293	8.617
650	422,500	274,625,000	25.495	8.662
660	435,600	287,496,000	25.690	8.706
670	448,900	300,763,000	25.884	8.750
680	462,400	314,432,000	26.076	8.793
690	476,100	328,509,000	26.267	8.836
700	490,000	343,000,000	26.457	8.879
710	504,100	357,911,000	26.645	8.921
720	518,400	373,248,000	26.832	8.962
730	532,900	389,017,000	27.018	9.004
740	547,600	405,224,000	27.202	9.045
750	562,500	421,875,000	27.386	9.085
760	577,600	438,976,000	27.568	9.125
770	592,900	456,533,000	27.748	9.165
780	608,400	474,552,000	27.928	9.205
790	624,100	493,039,100	28.106	9.244
800	640,000	512,000,000	28.284	9.283
820	672,400	551,368,000	28.635	9.359
840	705,600	592,704,000	28.982	9.435
860	739,600	636,056,000	29.325	9.509
880	774,400	681,472,000	29.664	9.582
900	810,000	729,000,000	30.000	9.654
1,000	1,000,000	1,000,000,000	31.622	10.000

SPECIFIC INDUCTANCE CAPACITY.

Solids.

Calcite	7.5 to 7.7
Ebonite	2.01 to 2.76
"	3.15
Fluorite	6.8
Glass, crown, hard, density 2.485	6.96
" quick change	3.11
" flint, very light, density 2.87	6.61
" light, density 3.2	6.72
" " quick change	3.01
" dense, density 3.66	7.38
" " quick change	3.05
" ex. dense, density 4.5	9.90
" extra dense..	3.16
" plate	8.45
" straw-coloured	2.96 to 3.66
" white mirror	5.83 to 6.34
Gutta-percha	4.2
Gutta-percha, h.f.	2.46
Gypsum	6.3
Ice (- 2°)	93.9
Indiarubber, pure, λ 6,000 m.	2.12
" pure	2.34
" vulc., 00 m.	2.69
" "	2.94
Ivory	6.9
Marble, λ 75 cm.	8.3
Mica	8.0
Paper, dry	2 to 2.8
Paraffin wax, quick change	1.977
" "	2.32
" " h.f.	2.19 to 2.34
Pitch	1.8
Porcelain	4.4 to 6.8
Quartz	4.5
Resin	2.55
Rock Salt	5.6
Selenium (16°)	6.3
Shellac, h.f.	2.74
"	2.75 to 3.73
Silica, fused	3.5 to 3.8
Spermaceti	2.2
Sulphur	2.88 to 3.21
" λ 75 cm.	3.94
Sylvin	4.9
Vaseline	2.2

Liquids.

Alcohol, methyl.	35.4/138.4
„ ethyl.	26.8/140.7
„ amyl.	16.0/200
Aniline, $a = 0.004$	7.30
Benzine, 20°	2.28
„ 74°	2.18
Bisulphide of Carbon at about 11° C.	1.97 to 2.22
„	1.81
Bromide	3.1
Carb. tetrachloride	2.25/180
Chloroform (18°)	5.2
Ethyl, acetate	6.7/0
„ chloride	10.9
„ ether, $a = 0.005$	4.37
Glycerine, $\backslash = 200$ cm.	39.1/15
Nitrobenzine	34/17
Oil, castor	4.78
„ olive	3.1 to 3.2
„ paraffin	2.0 to 2.6
„ sperm	3.02
„ „ at 20° C.	3.09
„ vaseline	1.9 to 2.2
Petroleum, spirit, Field's	1.92
„ essence of	2.17
„ oil, Field's	2.07
„ „ common	2.10
„ „	2.04 to 2.07
„ „ neutral at 21° C.	2.26
Toluene, $a = 0.001$	2.3
Turpentine, commercial	2.23
„ „ at 18.6° C.	2.43
„ oil of, at 17.1° C.	1.94
Water at 14° C.	83.8
„ 25° C.	75.7
Xylene, m , $a = 0.035$	2.4

Gases.

Air at about 100 atm. pressure	1.05
„ „ 5 atm. pressure	1.004
„ „ 1 mm. pressure	0.9994
Carbon dioxide at about 760 mm. pressure	1.0004
„ „ „ 40 mm. pressure	1.06
Hydrogen at about 760 mm. pressure	0.9997
„ „ 2 mm. pressure	1.000
Olefiant gas at about 760 mm. pressure	1.0007
Sulphur dioxide at about 760 mm. pressure	1.0093
Vacuum	0.9994

MATHEMATICAL CONSTANTS AND FORMULÆ.

Ratio of circumference to diameter of circle $\pi = 3.1416$

$$\frac{\pi}{2} = 1.5708 \qquad \frac{4}{3}\pi = 4.1888 \qquad \frac{1}{\pi} = 0.3183$$

$$\frac{\pi}{4} = 0.7854 \qquad \pi^2 = 9.870 \qquad \sqrt{\pi} = 1.772$$

$$4\pi = 12.566 \qquad \pi^3 = 31.01 \qquad \sqrt{\pi} = 1.465$$

ANGLES.

$$1 \text{ degree} = \frac{\pi}{180} \text{ radian} = 0.01745 \text{ radian.}$$

$$1 \text{ radian} = \frac{180}{\pi} \text{ degrees} = 57^\circ 0.2958$$

$$= 57^\circ 17' 14'' = 206,265 \text{ seconds.}$$

LOGARITHMS.

Base of natural logarithms $e = 2.71828$, $1/e = 0.3679$, $e^2 = 7.3890$.

To convert—

natural logarithms to common, multiply by $\log_{10} e = 0.43429$ common logarithms to natural, multiply by 2.3026 .

VARIOUS FORMULÆ:—

$$\text{Binomial } (1+x)^n = 1 + nx + \frac{n(n-1)}{1 \times 2} x^2 + \frac{n(n-1) \times (n-2)}{1 \times 2 \times 3} x^3 + \dots$$

for $x < 1$ numerically.

$$\text{Logarithmic } \log_e (1-x) = - \left(x + \frac{x^2}{2} + \frac{x^3}{3} + \dots \right)$$

for $x < 1$ numerically.

$$\text{Exponential } e^x = 1 + x + \frac{x^2}{1 \times 2} + \frac{x^3}{1 \times 2 \times 3} + \dots \text{ for all values of } x$$

$$\exp x = e^x$$

$$a = \exp (x \log_e a)$$

$$\frac{1}{2} (e^x + e^{-x}) = \cosh x,$$

$$\frac{1}{2} (e^x - e^{-x}) = \sinh x$$

$$\frac{1}{2} (e^{i\theta} + e^{-i\theta}) = \cos \theta,$$

$$\frac{1}{2} (e^{i\theta} - e^{-i\theta}) = i \sin \theta$$

$$\therefore \cosh i\theta = \cos \theta$$

$$\sinh i\theta = i \sin \theta$$

Trigonometrical.

$$\sin \theta = \sqrt{1 - \cos^2 \theta} = \frac{\tan \theta}{\sqrt{1 + \tan^2 \theta}}$$

$$\cos \theta = \sqrt{1 - \sin^2 \theta} = \frac{1}{\sqrt{1 + \tan^2 \theta}}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\sin \theta}{\sqrt{1 - \sin^2 \theta}} = \frac{\sqrt{1 - \cos^2 \theta}}{\cos \theta}$$

$$\sin (\theta + \phi) = \sin \theta \cos \phi + \cos \theta \sin \phi$$

$$\cos (\theta + \phi) = \cos \theta \cos \phi - \sin \theta \sin \phi$$

These formulæ are true for negative as well as positive angles, remembering that

$$\sin (-\phi) = -\sin \phi, \cos (-\phi) = \cos \phi$$

$$\sin (\pi - \phi) = \sin \phi, \cos (\pi - \phi) = -\cos \phi$$

From the above

$$\begin{aligned} a \cos \theta + b \sin \theta &= \sqrt{a^2 + b^2} \cos (\theta - \angle b/a) \\ &= \sqrt{a^2 + b^2} \sin (\theta + \angle a/b) \end{aligned}$$

From the above, also,

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$$

$$2 \sin^2 \theta = 1 - \cos 2\theta, \quad 2 \cos^2 \theta = 1 + \cos 2\theta$$

$$\sin 3\theta = 3 \sin \theta - 4 \sin^3 \theta$$

$$\cos 3\theta = 4 \cos^3 \theta - 3 \cos \theta$$

$$2 \sin \theta \sin \phi = \cos (\theta - \phi) - \cos (\theta + \phi)$$

$$2 \cos \theta \cos \phi = \cos (\theta - \phi) + \cos (\theta + \phi)$$

$$2 \sin \theta \cos \phi = \sin (\theta + \phi) + \sin (\theta - \phi)$$

CAPACITY OF ANTENNÆ.

For a single wire of length l , and diameter d , suspended at a height h above the ground, the capacity is

$$C = \frac{0.2416l}{\log_{10} \frac{4h}{d} + \log_{10} \left(\frac{l/2 + \sqrt{l^2/4 - d^2/4}}{l/2 + \sqrt{l^2/4 - 4h^2}} \right)}$$

Usually the diameter d may be neglected in comparison with the length l , and the following equations are convenient for numerical computations.

$$\text{For } \frac{4h}{l} = 1, \\ <$$

$$C = \frac{0.2416l}{\log_{10} \frac{4h}{d} - k_1}$$

$$\text{For } \frac{l}{4h} = 1, \\ <$$

$$C = \frac{0.2416l}{\log_{10} \frac{2l}{d} - k_2}$$

in which the quantities

$$k_1 = \log_{10} \left(\frac{1 + \sqrt{1 + \left(\frac{4h}{l} \right)^2}}{2} \right)$$

and

$$k_2 = \log_{10} \left(\frac{l}{4h} + \sqrt{1 + \left(\frac{l}{4h} \right)^2} \right)^2$$

may be interpolated from Table 6.

TABLE 6.

$4h/l$	k_1	$l/4h$	k_2
0	0	0	0
0.1	0.001	0.1	0.043
0.2	0.004	0.2	0.086
0.3	0.009	0.3	0.128
0.4	0.016	0.4	0.169
0.5	0.025	0.5	0.209
0.6	0.035	0.6	0.247
0.7	0.045	0.7	0.283
0.8	0.057	0.8	0.318
0.9	0.069	0.9	0.351
1.0	0.082	1.0	0.383

RATIO OF HIGH-FREQUENCY RESISTANCE TO THE DIRECT-CURRENT RESISTANCE.

X	$\frac{R}{R_0}$	Diff.	X	$\frac{R}{R_0}$	Diff.	X	$\frac{R}{R_0}$	Diff.
0	1.0000	0.0003	5.2	2.114	0.070	14.0	5.209	0.177
0.5	1.0003	0.0004	5.4	2.184	0.070	14.5	5.386	0.176
0.6	1.0007	0.0004	5.6	2.254	0.070	15.0	5.562	0.353
0.7	1.0012	0.0009	5.8	2.324	0.070	—	—	—
0.8	1.0021	0.0013	6.0	2.394	0.069	16.0	5.915	0.353
0.9	1.0034	0.0018	6.2	2.463	0.070	17.0	6.268	0.353
—	—	—	—	—	—	18.0	6.621	0.353
1.0	1.005	0.003	6.4	2.533	0.070	19.0	6.974	0.354
1.1	1.008	0.003	6.6	2.603	0.070	20.0	7.328	0.353
1.2	1.011	0.004	6.8	2.673	0.070	—	—	—
1.3	1.015	0.005	7.0	2.743	0.070	21.0	7.681	0.353
1.4	1.020	0.006	7.2	2.813	0.071	22.0	8.034	0.353
1.5	1.026	0.007	7.4	2.884	0.070	23.0	8.387	0.354
—	—	—	—	—	—	24.0	8.641	0.353
1.6	1.033	0.009	7.6	2.954	0.070	25.0	9.094	0.353
1.7	1.042	0.010	7.8	3.024	0.070	—	—	—
1.8	1.052	0.012	8.0	3.094	0.071	26.0	9.447	0.70
1.9	1.064	0.014	8.2	3.164	0.070	28.0	10.15	0.71
2.0	1.078	0.033	8.4	3.235	0.071	30.0	10.86	0.71
—	—	—	—	—	—	32.0	11.57	0.70
2.2	1.111	0.041	8.6	3.306	0.071	34.0	12.27	0.71
2.4	1.152	0.049	8.8	3.376	0.070	—	—	—
2.6	1.201	0.056	9.0	3.446	0.071	36.0	12.98	0.71
2.8	1.256	0.062	9.2	3.517	0.070	38.0	13.69	0.71
3.0	1.318	0.067	9.4	3.587	0.071	40.0	14.40	0.70
—	—	—	—	—	—	42.0	15.10	0.71
—	—	—	—	—	—	44.0	15.81	0.71
3.2	1.385	0.071	9.6	3.658	0.070	—	—	—
3.4	1.456	0.073	9.8	3.728	0.071	46.0	16.62	0.70
3.6	1.529	0.074	10.0	3.799	0.176	48.0	17.22	0.71
3.8	1.603	0.075	10.5	3.975	0.176	50.0	17.93	3.54
4.0	1.678	0.074	11.0	4.151	0.176	60.0	21.47	3.53
—	—	—	—	—	—	70.0	25.00	3.54
4.2	1.752	0.074	11.5	4.327	0.177	—	—	—
4.4	1.826	0.073	12.0	4.504	0.176	80.0	28.54	3.53
4.6	1.899	0.072	12.5	4.680	0.176	90.0	32.07	3.54
4.8	1.971	0.072	13.0	4.856	0.177	100.0	35.61	—
5.0	2.043	0.071	13.5	5.033	0.176	'00	'00	—

ATOMIC AND ELECTRONIC DATA

The radius of a hydrogen molecule is 1.2×10^{-8} cms.

The mass of a hydrogen molecule is 3.3×10^{-24} gms.

The average velocity of a molecule in air at 15° C. is 459 metres per second.

The mean free path of a molecule in air at atmospheric pressure is 1.42×10^{-5} cms.; in a soft valve of typical pressure .5 mm. the mean free path is 2.16×10^{-2} cms.; while in a hard valve of pressure 10^{-6} mm. the mean free path is 12,500 cms.

The number of molecules per cc. at atmospheric pressure is 2.75×10^{19} ; thus their average distance apart is 3×10^{-6} cms.

The number of molecules per cc. in a soft valve of pressure .5 mm. is 1.8×10^{16} ; thus their average distance apart is 3.8×10^{-6} cms.

The number of molecules per cc. in a hard valve of pressure 10^{-6} mm. is 3.6×10^{10} ; thus their average distance apart is 3×10^{-4} cms.



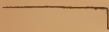







































The negative charge on an electron is 4.774 electrostatic units or 15.91×10^{-20} coulombs.

The diameter of an electron is 4×10^{-13} cms.

The mass of an electron is 9×10^{-28} gms.

The velocity of an electron after falling through a potential drop of V volts is $6 \times 10^7 \sqrt{V}$ cms. per second; thus after falling through a potential of 100 volts the electronic velocity is $6 \times 10^7 \times \sqrt{100} = 6 \times 10^8$ cms. per second.

GRAPHICAL SYMBOLS FOR RADIO DIAGRAMS.

	Aerial—Elevated.		Switch—Multi-way.
	Aerial—Horizontal or Buried.		Switch—Plug.
	Aerial—Directional.		Plug.
	Terminal.		Key—Morse Tapping.
	Wires—Twisted Pair.		Key—Morse, Back Contact.
	Connection—Electrical Joint.		Relay.
	Bridge—Crossing.		Detector—Crystal.
	Earth.		Coherer.
	Counterpoise.		Tikker.
	Cell. (The long thin stroke represents the Positive Terminal.)		Detector—Magnetic.
	Battery—L.T.		Rectifier. (Electron Current Flow assumed from Point to Plate.)
	Battery—H.T.		Vacuum Tube—Non-filament.
	Condenser—Large, Audio, Frequency.		Valve—Tube Thermionic.
	Condenser—Fixed Radio Frequency.		Valve Tube—Thermionic, 3-Electrode.
	Condenser—Variable (continuously) Radio Frequency.		Valve—Tube Thermionic, 4-Electrode.
	Telephones.		Lamp—Bulb Electric Filament
	Telephone—Loud Speaking.		Spark Gap—Open.
	Microphone—Telephone Transmitter.		Spark Gap—Quenched.
	Link.		Spark Gap—Rotary, Synchronous.
	Fuse.		Spark Gap—Rotary, Asynchronous.
	Switch—Single-way.		Lightning Arrestor.



Arc—Open.



Arc—Enclosed.



Arc—Generator.



Generator—D.C.



Generator—Alternating.



Motor.



Coupling—Mechanical.



Ammeter.



Milfiammeter.



Microammeter.



Voltmeter.



Galvanometer.



Decremeter.



Wattmeter.



Frequencymer.



Microfaradmeter.



Wavemeter.



Thermoammeter.



Resistance—Fixed.



Resistance—Variable.



Potentiometer Resistance.



Inductance.



Inductance—Variable.



Direction—From.



Direction—Towards.



Direction.



Coupling—Inductive.



Coupling—Inductive, Variable.



Coupling—Inductive, Variable, one Inductance Variable.



Coupling—Inductive, Variable (Alternative).



Variometer.



Radiogoniometer.



Transformer—Iron Core.



Coupling—Autotransformer.



Choke Coil—Iron Core.



Magnet—Electro.



Vibrator—Buzzer Make and Break.

COMPANIES ENGAGED IN THE
COMMERCIAL DEVELOPMENT
OF WIRELESS TELEGRAPHY
AND TELEPHONY

PARTICULARS OF COMPANIES ENGAGED IN THE COMMERCIAL DEVELOPMENT OF WIRELESS TELEGRAPHY & TELEPHONY

Amalgamated Wireless (Australasia), Ltd.

Incorporated.—July 11th, 1913, in the State of New South Wales.

Head Office.—"Wireless House," 97, Clarence Street, Sydney, New South Wales.

Melbourne Office.—Wireless House, 422/4, Chancery Lane, Melbourne, and Collins House, Collins Street, Melbourne, Victoria.

New Zealand Office.—"Australasia Chambers," Customs House Quay, Wellington, New Zealand.

Directors.—Sir William Vicars, C.B.E. (Chairman), Rt. Hon. W. M. Hughes, K.C., E. T. Fisk, Esq., Member I.R.E., C. P. Bartholomew, Esq., G. Mason Allard, Esq., F.C.P.A., Capt. T. Langley-Webb, J. Stinson, Esq.

Managing Director.—Ernest T. Fisk.

Assistant Manager and Secretary.—J. F. Wilson, A.C.I.S.

Accountant.—F. W. Larkins, A.I.I.A., A.C.I.S.

Transocean Radio Service.—Chief Engineer, Traffic Manager, and other Executives to be appointed.

Coastal Radio Service.—Manager.—L. A. Hooke. Superintendent.—G. Weston.

Marine Radio Service.—Traffic Manager.—J. L. Mulholland. Equipment Manager.—D. Campbell.

Radio Concert Service.—Temporary Staff.

Radio Electric Works.—Manager.—S. M. Grime. Assistant Manager.—E. A. Horner.

Technical, Research and Patents Department.—Superintendent.—G. Apperley.

Branch Managers.—L. A. Hooke, Victoria. G. Robertson, New Zealand.

Capital.—Authorised, £1,000,000. Subscribed capital issued, June 30th, 1922:—

181,400 Fully paid shares	£181,400	0	0
762,636 Shares paid to 2s.	76,263	12	0
40,882 Shares paid to 1s.	2,044	2	0
	£259,797 14 0		

The Company has acquired an exclusive and perpetual license to use and exploit in Australia and New Zealand, together with certain rights in other British territories in the Pacific and Indian Oceans, the present and future patents of Marconi's Wireless Telegraph Company Ltd., London, Radio Corporation of America, as well as the Telefunken system, and a prominent French system. It also has rights to the patents of the Poulsen Pedersen arc system.

Of the 1,000,000 ordinary shares, 500,000 shares are held by the Commonwealth Government. The Board consists of seven Directors, three appointed by the Government, three appointed by the private shareholders, and a seventh Director elected by a majority vote of the other six, or appointed by arbitration. In September, 1922, the Prime Minister of the Commonwealth, Rt. Hon. W. M. Hughes, K.C., was nominated by the Cabinet for the position of seventh Director, and unanimously elected by the other Directors. Sir William Vicars, K.B.E., one of the Government Directors, is Chairman of the Company.

An agreement was made in March, 1922, between the Commonwealth Government and the Company, providing for the establishment of direct wireless communication between Australia and Great Britain; feeder services between the main trunk station and the capital city of every State; re-organisation and re-equipment of the existing coastal service, and for the future development of all branches of wireless communication within Australia and between Australia and countries over seas. In the event of an outbreak of war, the entire organisation of the Company will become a unit of the defence forces of the Commonwealth.

The Company has an extensive manufacturing works in Sydney, in which all classes of radio apparatus, including electronic valves, are produced; it owns and operates 28 wireless stations within the Commonwealth and its territories, in addition to 200 stations on board Australian and New Zealand ships.

Accounts.—The accounts are made up to June 30th in each year. The profit and loss account for the twelve months ended June 30th, 1922, shows that the gross profit from trading and revenue from wireless stations amounted to £63,165 5s. 8d., and after deducting all expenses and providing for reserves, there was a net profit of £9,251 10s. 7d., from which a dividend at the rate of 6 per cent. per annum was paid. The reserve accounts at June 30th, 1922, stood at £51,190 1s.

Dividends.—1913-14, 4 per cent. 1914-15, 6 per cent. 1915-16, 5 per cent. 1916-17, 5 per cent. 1917-18, 5 per cent. 1918-19, 5 per cent. 1919-20, 5 per cent. 1920-21, 6 per cent. 1921-22, 6 per cent.

American Radio and Research Corporation

Incorporated.—June 15th, 1915.

Head Office.—Medford Hillside, Massachusetts.

District Offices.—21, Park Row, New York City, New York, U.S.A. 220, South State Street, Chicago, Ill., U.S.A.

Directors.—J. Axten, Havens Grant, and H. J. Power.

Vice-President and General Manager.—Harold J. Power.

Secretary.—Havens Grant.

Capital.—\$300,000.

Dividends.—Close corporation.

Trade Names.—Amrad Radio Products and Twin-R Electrical Specialities.

The Company designs and manufactures fractional horse-power motors and accessories, wireless telegraph and telephone apparatus.

British Broadcasting Company (The)

Founded.—1922.

Head Office.—Magnet House, Kingsway, W.C.2 (Temporary).

Directors.—Lord Gainford (Chairman), Godfrey Isaacs, John Gray, Henry M. Pease, Sir Wm. Noble, Major Basil Binjon, C. F. Elwell, Archibald McKinsley.

Secretary.—Anderson.

The shares may be allotted or disposed of as the Board may determine, provided that the Board shall not, without the previous written approval of the Postmaster-General allot more than 60,000 shares in the united capital to the following six companies or their nominees:—

Marconi's Wireless Telegraph Company, Ltd.

Metropolitan-Vickers Electrical Co., Ltd.

Radio-Communication Co., Ltd.

British Thomson-Houston Co., Ltd.

General Electric Co., Ltd.

Western Electric Co., Ltd.

and that the Board shall, up to a total of 39,994 shares, issue to applicants, being *bona fide* British manufacturers of wireless apparatus other than the above six companies, the full amount of shares (not exceeding 10,000 to any one applicant) for which applicants may apply.

Chinese National Wireless Telegraph Company (The)

Incorporated.—Under Special Charter by virtue of an agreement dated May 24th, 1919, between the Government of the Republic of China and Marconi's Wireless Telegraph Company, Ltd.

Office.—5, Peh Ch'a Ta Fu Ssu, Peking.

Directors.—Lieut.-Gen. Ting Ching (Chairman), Rear-Admiral Chen Ngen Tao, Godfrey C. Isaacs, T. A. Barson, A. H. Ginman (Vice-Chairman and Managing Director).

Secretary.—Sohstu G. King.

Capital.—Authorised £700,000 in 700,000 shares of £1 each.

The Company was formed to manufacture, sell and maintain wireless telegraph and telephone apparatus in China, and has been granted a license by Marconi's Wireless Telegraph Company, Ltd., giving it the sole right to use in China all the Marconi Company's Patents, present and future, for wireless telegraphy and telephony.

Compagnie Radic-Maritime

Incorporated.—April 24th, 1919.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—MM. Bousquet (President), Baron de la Chevrelère (Vice-President), N. Pietri, E. Girardeau, E. Sins, Dal Piaz, Musnier, and Max Robert.

Managing Director.—M. N. Pietri.

Capital.—5,000,000 francs, divided into 50,000 shares of 100 francs each.

The Company owns and operates wireless telegraph apparatus on merchant vessels.

The Company also operates aeroplane wireless stations.

Compagnie Générale de Télégraphie Sans Fil

Incorporated.—February 5th, 1918.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—H. Bousquet (President), Baron de la Chevrelère (Vice-President), E. Girardeau (Administrator), A. L. Atthalin, M. Bloch, A. Dupont, Godfrey C. Isaacs, E. May, N. Pietri, E. Sins, Paul Gauthier, L. Wibratte, Baron Jacques de Gunzburg.

Managing Director.—E. Girardeau.

Chief Engineer.—Major Brenot.

Capital.—50,000,000 francs, divided into 100,000 shares of 500 francs each, subscribed and fully paid; 32,000 Parts Bénéficiaires have also been issued.

The financial year ends December 31st.

Companhia Nacional de Comunicações Sem Fio

Incorporated.—March 29th, 1922.

Head Office.—107, Rua 1^o de Marco, Rio de Janeiro.

Directors.—Dr. Rodrigo Octavio Filho, Louis Edgar Sanceau.

President.—Dr. Rodrigo Octavio Filho.

Managing Director.—Louis Edgar Sanceau.

Capital.—Rs.600:000 \$000 divided into 6,000 shares of 100\$000 each.

The objects of the Company are to exploit various patents of the Marconi Co., as also to act as agents for them.

Compania Radiografica Internacional de Costa Rica

Incorporated.—

Head Office.—San Jose.

Directors.—Mr. Arturo Volio Jiménez, Dr. Autorio Aniceto Facio Villosa.

President.—Mr. José Joaquín Carranza Volio.

Vice-President.—Mr. Ricardo Pacheco Lara.

Treasurer and Secretary.—Mr. Nicolas Peña.

Auditors.—Mr. Porfirio Góngora Umaña, Mr. Juan Gomez Alvarez, Mr. Oscar Monteclegre Gutierrez.

Manager.—Mr. José Joaquín Carranza.

Deputy Manager.—Mr. Ricardo Pacheco Lara.

Capital.—\$10,000 (gold American), 100 Shares.

The Company was formed solely and exclusively for the exploitation of the concession relating to wireless communications which is the property of Messrs. José Joaquín Carranza Volio and Ricardo Pacheco Lara, according to the contract made with the supreme Government on May 5th, 1921, and approved by decree No. 47 of July 25th, 1921.

Companhia Radiotelegraphica Brasileira

Incorporated.—August 14th, 1919.

Head Office.—107, Rua 1^o de Marco, Rio de Janeiro.

Directors.—Pedro A. Nolasco Pereira da Cunha, Louis Edgar Sanceau.

President.—Pedro A. Nolasco Pereira da Cunha.

Managing Director.—Louis Edgar Sanceau.

Members of the Fiscal Council.—Dr. Mario de Andrade Ramos, Señor Henrique Lage, Señor Joao Gentil de Mello Araujo.

Members of the Supplementary Council.—Jack Maurice, Dr. Rodrigo Octavio Filho, Señor Roberto Cardoso.

Capital.—Rs.200:000 \$000 (two hundred contos de reis) divided into 2,000 (two thousand) shares of 100\$000 (hundred milreis) each.

The objects of the Company are to exploit the contract made with the Government of Brazil for the erection of high power stations for direct communication with Europe and the United States.

Compania Marconi de Telegrafia Sin Hilos del Rio de La Plata

Incorporated.—August 4th, 1906.

Head Office.—Calle San Martin 459, Buenos Aires, Argentina.

Directors.—Captain Guillermo José Nunes (President), Señor Florence O'Driscoll (Managing Director), Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., Godfrey C. Isaacs, Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Señor Duncan Munro, Señor J. A. Pilling, Señor Carlos Pereira Pinto, Señor Enrique Schlieper, Sidney F. St. J. Steadman, Señor Antonio Terrarosa.

Secretary.—Enrique Schlieper.

Treasurer.—J. A. Pilling.

Auditor.—Herbert K. James.

Engineer.—E. Berry.

Capital.—\$2,000,000 gold, represented by 250,000 shares of \$5 gold each, series "AA," fully paid, and 150,000 Preference shares, 5 per cent. (non-cumulative) of \$5 gold each, series "BB," 35 per cent. has been called up on the "BB" shares. The balance is payable in instalments of 10 per cent. with not less than thirty days' notice. The financial year of the Company ends on May 31st.

The Company owns the Marconi patents and patent rights for the Argentine Republic, and has licenses from Marconi's Wireless Telegraph Company, Limited, and the Marconi International Marine Communication Company, Limited, to work the Marconi system in the Republics of Argentina, Uruguay, and Paraguay. The Company has the permission of the Government to erect wireless telegraph stations within the territorial limits of the Argentine Republic and on vessels flying the Argentine flag. The Company is constructing a high-power wireless station in the Argentine Republic to communicate direct with a similar station in Europe.

Compañía Nacional de Telegrafía Sin Hilos

Incorporated.—December 24th, 1910.

Head Office.—Calle de Alcalá, 43, Madrid.

Branch Offices.—Ronda de la Universidad 35, Barcelona; Buenos Aires 13, Bilbao.

Directors.—Excmo. Sr. General Don José de Bascaran; Excmo. Sr. Sentore G. Marconi, G.C.V.O., LL.D., D.Sc.; Godfrey C. Isaacs; Excmo. Sr. Don Antonio Comyn, Conde Vo. de Albiz; Excmo. Sr. Don Eduardo Estelat; Excmo. Sr. Don Francisco Setuain; Sr. Don Jaime Macnaughtan; Don A. Gálvez Canero; Don Carlos de Albert Despujol.

Secretary.—Sr. Don José Asensio.

Capital.—6,500,000 pesetas, divided into 8,000 6 per cent. Participating Preference shares of 500 pesetas each, and 5,000 Ordinary shares of 500 pesetas each, all issued and fully paid.

The financial year ends on December 31st.

This Company took over the concession from the Spanish Government for the construction and exploitation of a public wireless telegraph service in Spain and its colonies. The Company has ten wireless telegraph land stations erected and working at Aranjuez, near Madrid, Cadiz, Barcelona, Tenerife, Las Palmas, Vigo, Soller, Finisterre, Santander, and Cape Palos, and has further stations in course of construction. The Company holds an exclusive license from Marconi's Wireless Telegraph Company, Limited, to use and exploit its patents in Spain and her colonies.

The Company has established a direct wireless telegraph service between Spain and England, via Madrid and London, with Germany via Madrid and Barcelona and Nauen, with Austria and Hungary via Barcelona and Budapest, with France via Sainte Assise, with Italy via Barcelona and Coltano, with Switzerland via Madrid and Berne, and with North, Central and South America via Madrid and London Marconi.

Compagnie Radio-France

Head Office.—Paris, 79, Boulevard Haussmann.

General Offices and Showrooms.—166, Rue Montmartre, Paris.

Directors.—Jules Cambon (President), Henri Bousquet, Emile Girardeau, Nicolas Pietri, Louis Wibratte, Marcel Bloch, Baron de la Chevrelière, André Dupont, Paul Gauthier, André Laurent Athalin, Ernest May, Henri-Valentin Mehu.

Capital.—Fr. 60,000,000.

The Company which owns the Radio Transmitting Centre of Ste. Assise and the Radio Receiving Centre of Villecresnes, maintains public radiotelegraphic communication with Great Britain, America, Spain, etc. It also supplies material and apparatus and erects wireless stations of any power for telegraphic or telephonic communication.

Drahtloser Übersee-Verkehr A.G. (Transradio)

Founded.—1918.

Head Office.—Berlin, S.W.11, Hallesches-Ufer 12/13.

Founded by the Allgemeine Elektrizitäts-Gesellschaft, Siemens & Halske A.G. and the Gesellschaft für drahtlose Telegraphie m.b.H. (Telefunken), Berlin. The Company was formed to exploit installations for wireless telegraphy and telephony in Germany and other countries.

Directors.—Fritz Karl Solff.

The Company has substantial interests in the Transradio, Compania Radiotelegráfica Argentina S.A., Buenos Aires.

Federal Telegraph Company (The)

Incorporated.—In the State of California, in 1911.

Offices.—Hobart Building, San Francisco, California.

Factory.—Palo Alto, California.

Directors.—R. P. Schwerin, Leon Bocqueraz, Hiram W. Johnson, Jun., Alexander Hamilton and B. E. Alanson.

President.—R. P. Schwerin.

Vice-President.—Leon Bocqueraz.

Secretary.—Augustus Taylor.

Treasurer.—J. E. Godcharles.

Capital.—\$2,500,000; 250,000 shares, par value each \$10.00.

The Company was formed for the operation of wireless telegraphy and the manufacture of the Poulsen Arc and other wireless sets.

Gesellschaft für Drahtlose Telegraphie m.b.H. (Telefunken)

Incorporated.—June 15th, 1903.

Head Office.—Hallesches Ufer 12/13, Berlin, S.W.11.

Directors.—Dr. Ing. e.h. Count von Arco, Dr. Ing. C. Schapira, Fritz Ulfers, Dr. Emil Mayer, Hans Bielschowsky.

Founded by the Allgemeine Elektrizitäts-Gesellschaft, Berlin, and Siemens and Halske A.G., Berlin, for the exploitation of the patents of Professor Slaby, Professor Braun, and Count von Arco all over the world.

The Company whose shares are in the sole possession of the Allgemeine Elektrizitäts-Gesellschaft and Siemens and Halske, Berlin, is interested in the following companies:—

Amalgamated Wireless Co., Sydney.
 Det Norske Radioselskap (System Teunken), Kristiania.
 Deutsche Betriebsgesellschaft für drahtlose Telegrafie m.b.H., Berlin (Debeg).
 Deutsche Südsee-Gesellschaft für drahtlose Telegrafie A.-G., Berlin.
 Drahtloser Übersee-Verkehr, A.-G., Berlin (Transradio).
 Eilvese G.m.b.H., Berlin.
 Société Anonyme Internationale de Télégraphie sans Fil, Brussels.
 Società Radiotelegrafica Italiana, Rome.
 Svenska Aktiebolaget Tradloes Telegraf, Stockholm.
 Telefunken-Marconi Code A.-G., Berlin.
 Telefunken, Ostasiatische Gesellschaft für drahtlose Telegraphie m.b.H., Shanghai.
 Transradio Compañia Radiotelegrafica Argentina S.A., Buenos Aires.

International Radiotelegraf & Telefon Compagni (Irotco)

Registered.—June 30th, 1920.

Head Office.—Sct. Annaegaard, Dronningensgade 68, Copenhagen C.

Engineer's Office and Laboratory.—Prinsessegade 29B, Copenhagen C.

Directors.—Commander H. Haagensen, H. A. Wahnöe, W. A. Peters.

Capital.—Danish crowns, 100,000.

The Company was formed for the purpose of the construction and manufacture of radiotelegraphic and radiotelephonic apparatus of all kinds for land, as well as sea and air.

Independent Wireless Telegraph Company, Inc.

Incorporated.—February 12th, 1919, in the State of Delaware, U.S.A.

Head Office.—42, Broadway, New York, U.S.A.

European Office.—7, Hobart Place, London, S.W.1., England.

Factory.—Port Chester, New York, U.S.A.

Directors.—P. R. Mallory, C. J. Pannill, C. D. Mallory, and Frank C. Munson.

President.—P. R. Mallory.

Vice-President and General Manager.—C. J. Pannill.

Treasurer.—F. H. Seeley.

European Superintendent.—D. J. Heilig.

Capital and Dividends.—Close Corporation.

The Company was formed for the operation of wireless telegraphy and the manufacture of wireless telegraph apparatus.

Marconi International Marine Communication Company, Limited (The)

Incorporated.—April 25th, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy Chairman and Managing Director), Alfonso Marconi, Capt. H. Riall Sankey, C.B., C.B.E., R.E. (retired), Henry W. Allen, F.C.I.S., W. W. Bradfield, C.B.E., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., and Lt.-Col. A. Simpson, C.M.G., R.E. (retired) (Deputy Managing Director).

Joint General Managers.—W. W. Bradfield, C.B.E., Henry W. Allen, F.C.I.S.

Assistant General Manager.—F. S. Hayburn.

Secretary.—A. Ogle, M.C., A.C.I.S.

Marine Superintendent.—Capt. C. V. Daly.

Contract Manager.—A. R. Harding.

Technical Manager.—Commander J. A. Slee, C.B.E., R.N.

Capital.—£1,500,000 in shares of £1 each, issued and fully paid £1,192,726. (The capital was increased in May, 1919, by 900,000 shares of £1 each, of which 600,000 were offered to existing shareholders pro rata at par.) 5½ per cent. First Mortgage debentures (bearer)—authorised £250,000, issued £125,000 outstanding £59,280. Secured (without trust deed) as a floating charge on the undertaking and all the property. Redeemable at par, July 1st, 1941. Interest payable, January 1st and July 1st.

Accounts and Dividends.—Accounts are made up to December 31st and usually submitted in June following. The accounts at December 31st, 1921, showed, after deduction of £20,000 paid on account of Excess Profits Duty, a profit of £144,595, which included the amount brought forward. After payment of dividend £25,322 was carried forward subject to Excess Profits Duty for years 1916 to 1920 inclusive, less amount paid on account, and Corporation Profits Tax for 1920 and 1921.

Dividends paid, 1910, 5 per cent.; 1911, 7 per cent.; 1912, 1913 and 1914, 10 per cent.; 1915, 12½ per cent.; 1916, 1917, 1918, 1919 and 1920, 15 per cent.; 1921, 10 per cent.; 1922, 5 per cent. Interest paid 6th January, 1923.

Last Bearer Coupon paid, No. 22.

This Company was formed for the purpose of working throughout the world, except in the United States of America, Hawaii, Chili, and colonies or dependencies of those States, an exclusive license for all maritime (being mercantile or yachting) purposes granted by Marconi's Wireless Telegraph Company, Limited. The Company has transferred to Associated Companies its rights in Canada, Argentina, Uruguay, Australasia, and all European countries and their dependencies except the United Kingdom and Italy. This Company owns and operates the wireless telegraph apparatus on about 3,000 vessels of the mercantile marine.

Marconi Scientific Instrument Company, Limited (The)

Incorporated.—November 1st, 1919.

Registered Office and Works.—70, Dudden Hill Lane, Willesden.

Directors.—William W. Drury (Managing Director), Henry W. Allen, F.C.I.S., W. W. Bradfield, C.B.E., R. D. Bangay.

Secretary.—Arthur J. Wheeler, A.C.I.S.

Capital.—Authorised £40,000 in 40,000 shares of £1 each.

The Company was formed to manufacture and sell amateur wireless telegraphic and telephonic apparatus under license from Marconi's Wireless Telegraph Company, Limited. Also to manufacture and market all classes of land-line and submarine cable apparatus.

"Marconi" Societate Anonima Română Pentru Industria Si Comertul de Materiale Telegrafice, Telefonice Si Electrice

Incorporated.—April 5th, 1920.

Amalgamated with "Radioelectrica" Societate Anonimă Română pentru industria si comertul materialelor telegrafice si telefonice, with effect from October 27th, 1921.

Present Name.—"Radioromana" Societate Anonimă Română pentru industria si comertul materialelor telegrafice si telefonice.

Address of Head Office.—4, Strada Saguna, Bucharest.

Directors.—Prince Barbu Stirbey (President), C. P. Olănescu (Vice-President), N. Vasilescu-Karpen, Godfrey Isaacs, Alex. Tzigara-Sumurcas, Capt. Edwin Boxshall, C. D. Busilă, Cezar Boerescu, D. Leonida, Emile Girardeau, Paul Mangard.

Managing Directors.—C. Busilă, Paul Mangard.

General Manager.—Eugen Craioveanu.

Secretary.—Major A. A. O'Kelly.

Capital.—12,000,000 lei. 24,000 fully paid-up shares of 500 lei each.

The Company was formed for the manufacture, supply and installation of all kinds of telegraphic and telephonic apparatus, including wireless.

Marconi Wireless Telegraph Company of Canada, Limited (The)

Head Office.—Marconi Building, 9-11-13, Saint Sacrament Street, Montreal, Canada.

President.—C. G. Greenshields, K.C.

Vice-Presidents.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Robert Bickerdike, A. E. Dymont.

Directors.—Godfrey C. Isaacs, G. M. Bosworth, H. W. Allen, F.C.I.S.

General Manager.—H. M. Short.

Comptroller and Acting Secretary.—J. P. Fleming.

Traffic Manager.—G. H. Pearson, Assoc.I.R.E. (New York).

Chief Engineer.—J. H. Thompson, B.Sc., A.M.I.R.E. (New York), A.M.I.E.E. (New York), A.M.I.C.E. (Canada).

Authorised Capital.—\$7,500,000 in 3,000,000 shares of \$2.50 each.

Issued Capital.—5,700,000 shares.

The Company has 50% wireless rights under all Marconi and General Electric Company patents in the Dominions of Canada and Newfoundland. It is the only Company in Canada manufacturing wireless apparatus and providing wireless service. It owns and operates the wireless equipment on over two hundred ships of the Canadian and Newfoundland Mercantile Marines, and also owns and operates the duplex, transatlantic, commercial wireless telegraph station at Glace Bay in Nova Scotia.

The Company operates under contract with the Canadian and Newfoundland Governments, about forty wireless stations in the Great Lakes, Gulf of St. Lawrence, and on the Atlantic Coast. It has branch offices in Vancouver, B.C., Toronto, Ont., St. John, N.B. (winter), and St. John's (Nfld.). It owns and operates schools of radiotelegraphy in Montreal, Toronto, and St. John's (Nfld.).

Marconi's Wireless Telegraph Company, Limited

Incorporated.—July 20th, 1897, as "Wireless Telegraph and Signal Co., Ltd."; name changed as above in March, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Works.—Chelmsford, Essex.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy-Chairman and Managing Director), Captain H. Riall Sankey, C.B., C.B.E., R.E. (retired), Alfonso Marconi, Henry W. Allen, F.C.I.S., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., Lt.-Col. Adrian Simpson, C.M.G., R.E. (retired) (Deputy Managing Director) and The Rt. Hon. F. G. Kellaway, P.C.

Joint General Managers.—W. W. Bradfield, C.B.E., Henry W. Allen, F.C.I.S.

Assistant General Managers.—G. E. Turnbull and H. W. Corby, F.C.I.S.

Secretary.—A. Ogle, M.C., A.C.I.S.

Chief Engineer.—Andrew Gray, M.I.E.E., A.M.Inst.C.E.

The Company was formed to acquire Senatore Marconi's patents for wireless telegraphy in all countries except Italy, its colonies and dependencies, and has since acquired a large number of other patents relating to wireless telegraphy, including those of Sir Oliver Lodge, the General Electric Company of New York (except for America), etc.

It has substantial interests in various subsidiary and affiliated Companies.

The Company conducts public wireless telegraph services, and messages are accepted for transmission, via Marconi, to the United States of America, Central and South America, Canada, Australia New Zealand, the West Indies, British Guiana, British Honduras, Spain, France, Switzerland, etc.

Accounts and Dividends.—Accounts are made up to December 31st, and usually submitted in June following. The Company's accounts at December 31st, 1921, showed shares in Associated Companies and Patents, £3,237,213 (par value of shares, £4,149,584), and General Reserve Account £3,986,914. The profit for the year, together with the balance brought forward, was £1,093,928, and after payment of dividends, £666,830 was carried forward.

In respect of each of the years 1911, 1912 and 1913, the Company paid dividends of 17 per cent. on the Preference shares and 20 per cent. on the Ordinary shares; in respect of 1914 and 1915, 7 per cent. Preference and 10 per cent. Ordinary dividends were paid; in respect of 1916 the dividends were 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares; in respect of 1917 the dividends were 17 per cent. on Preference shares and 20 per cent. on the Ordinary shares. For 1918 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid. For 1919 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid, plus a bonus of 5s. per share on both Preference and Ordinary shares. For 1920 and 1921, dividends of 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares were paid. 1922 7 per cent. Preference and 5 per cent. interest on Ordinary paid February 1st, 1923. (Last Bearer Coupons paid: No. 24 Preference, No. 23 Ordinary.)

Capital.—Authorised £4,000,000 in 3,750,000 Ordinary shares of £1 each, and 250,000 Cumulative Participating Preference shares of £1 each. Issued 2,750,000 Ordinary shares of £1 each, and 250,000 Preference shares of £1 each. The Preference shares are entitled to a cumulative dividend of 7 per cent., and, after the Ordinary shares have received a 10 per cent. non-cumulative dividend, to share *pari passu* with the latter shares in surplus profits remaining.

6½ per cent. Ten Year Convertible First Debenture Stock. Authorised, £3,000,000. Issued, £1,500,000. Secured as a first floating charge on all the Company's assets present and future, including uncalled capital (if any). Repayable on or before October 1st, 1932.

Stockholders have right to convert on any January 1st, April 1st, July 1st and October 1st, between April 1st, 1923, and April 1st, 1929, all or any part of their holding into ordinary shares on the basis of one fully paid share of £1 for each £3 of debenture stock.

Interest payable half-yearly on April 1st and October 1st.

Nederlandsche Seintoestellen Fabriek

Incorporated.—February 27th, 1918.

Head Office and Works.—Jan v. d. Heydenstraat, Hilversum, Holland.

Directors.—Bern E. Ruys (President), G. L. Tegelberg (Commissaire Délégué), D. Hudig, L. Jzn. J. M. Goudriaan, J. H. Hummel, A. E. J. Bertling, A. Veder, G. C. Isaacs, G. E. Turnbull, J. Rypperda Wierdsma.

Manager.—A. Dubois.

Capital.—3,000,000 florins, divided into 3,000 shares of 1,000 florins each.

The financial year ends, December 31st.

The Company was formed for the purpose of exploiting a factory or factories for the manufacture of installations, apparatus and tools destined for or relating to wireless telegraphy, telephony, signalling apparatus, etc., and trading in the above-mentioned apparatus. It has entered into an agreement with Marconi's Wireless Telegraph Company, Limited, whereby the latter Company grants to the N.S.F. the exclusive right to manufacture and sell in Holland and the Dutch Colonies wireless material according to its Patents and designs, present and future.

Representatives for Holland and Colonies.—For the New Antwerp Telephone and Electrical Works at Antwerp and The Society Belge Gardy, Manufacturers of electrical supplies as switches, fuses, transformers, insulators, etc., at Uccle-Calevoet, Belgium, near Brussels.

Nederlandsche Telegraaf Maatschappij, "Radio-Holland"

Incorporated.—December 6th, 1916.

Head Office.—562 Keizersgracht, Amsterdam.

Directors.—D. Hudig L. Jzn (President), J. Rypperda Wierdsma, A. J. M. Goudriaan, T. H. de Beaufort, G. L. Isgelberg, P. J. Roosegaarde Bisschop, H. Colyn, Prof. C. L. van der Bilt, J. F. van Hengel, Senatore G. Marconi, Godfrey C. Isaacs, Maurice Travailleux, Gaston Périer.

Managing Directors.—L. H. F. Wackers and Th. P. van den Bergh.

Administrator, Dutch East Indies.—W. A. J. Liebert.

Capital.—3,000,000 florins, divided into 3,000 shares of 1,000 florins each, of which 2,000 shares have been issued and fully paid.

The financial year ends at December 31st.

The Company was formed for the purpose of the establishment, sale, hire, control and exploitation of wireless telegraph and wireless telephone stations in Holland and its colonies.

Norsk Marconikompani Aktieselskap

Constituted.—November 28th, 1918.

Head Offices.—Karl Johansgate 5, Kristiania.

Branch Office.—Fimmegaardsgaten 6, Bergen.

Capital.—1,250,000 Kroner, divided into 1,250 registered shares of Kroner 1,000 each.

Directors.—Otto Thoresen (Kristiania), Godfrey C. Isaacs (London), Commander J. Bull (Horten), K. Zimmer (Bergen), L. Kloster (Kristiania), G. E. Turnbull (London).

Deputy Directors.—A. Hubert (Bruxelles), J. Ringstad (Drammen).

Managing Director.—E. S. Skottun.

Technical Manager.—B. L. Gottwaldt.

This Company was constituted for the manufacture, sale, and rental of apparatus for Wireless Telegraphy, Telephony, Signalling, etc., and other business in connection therewith. It has acquired the Marconi patent rights, present and future, for exploitation in Norway and on board ships flying the Norwegian flag.

Pan-American Wireless Telegraph and Telephone Company (The)

Incorporated.—State of Delaware, U.S.A. Amended Certificate of Incorporation, October 18th, 1917.

Offices.—233, Broadway, New York City.

Directors.—Hon. John W. Griggs, Edward J. Nally, James R. Sheffield, David Sarnoff, Edward W. Harden, Albert G. Davis, C. B. Coady, R. Mainzer, R. P. Schwerin.

Chairman.—Hon. J. W. Griggs.

President and General Manager.—Edward J. Nally.

Vice-President and Commercial Manager.—David Sarnoff.

Vice-President.—Powhatan Page.

Secretary.—Charles J. Ross.

Treasurer.—George S. De Sousa.

Assistant Secretary and Assistant Treasurer.—L. MacConnach.

Capital.—3,500 shares 7 per cent. preferred stock of \$100 each, cumulative after January 1st, 1921; 50,000 shares common stock, no par value. The financial year ends December 31st.

The Company has the exclusive right and license to use the Marconi and Poulsen Patents for the sole purpose of radio or wireless communication between the United States of America and all countries of South America, Central America, Mexico, the Islands of Cuba, Porto Rico, and the West Indies.

Radio Communication Company, Limited

Incorporated.—March 14th, 1919.

Head Office.—34/35, Norfolk Street, London, W.C.2.

Directors.—T. W. Stratford-Andrews (Chairman), Sir Wm. R. Brooke, K.C.I.E., J. Herbert Scrutton, Capt. R. S. Hilton, B. Binyon, O.B.E. (Managing Director).

General Manager.—A. B. Snooden.

Secretary.—W. H. C. Rowe, C.B.E.

Capital.—£200,000, divided into 100,000 6 per cent. Cumulative Participating Preference shares and 100,000 Ordinary shares. Issued: 79,502 Ordinary and 81,650 Preference.

The Company was formed under the aegis of the Indo-European Telegraph Company, Limited, for the manufacture, sale and operation of radio apparatus, including "Polar" radio equipment for ships.

Radio Corporation of America

Incorporated.—October 17th, 1919, in the State of Delaware.

New York Office.—Woolworth Building, 233, Broadway, New York City.

Directors.—Owen D. Young (Chairman), E. J. Nally, E. W. Rice, Jun., Hon. John W. Griggs (General Counsel), James R. Sheffield, A. G. Davis, Gordon Abbott, Edward W. Harden, George S. Davis, Guy E. Tripp, Edwin M. Herr, Arthur E. Braun.

President.—Major General James G. Harbord.

Managing Director of International Relations.—Edward J. Nally.

Vice-President and General Manager.—David Sarnoff.

Vice-President and General Attorney.—William Brown.

Secretary.—John W. Elwood.

Assistant Secretary.—L. MacConnach.

Comptroller.—Charles J. Ross.

Treasurer.—George S. de Sousa.

Assistant Treasurer.—M. H. Payne.

Capital.—Authorized: \$25,000,000 Preferred Stock in 5,000,000 shares of \$5 each. There are also 7,500,000 Common shares of no par value. Issued: \$19,779,870 in 3,955,974 Preferred shares of \$5 each, fully paid 5,732,000 Common shares of no par value. Rights: The Preferred Stock is entitled to receive dividends of 7 per cent. per annum and no more. In any distribution of the

assets it is entitled to be paid off at par, prior to any payment to the Common shareholders. The Preferred dividends are cumulative after the fiscal year ending in or with the calendar year 1923, and the Preferred Stock may be retired on any day on which a dividend thereon shall be payable, at \$5.50 per share and accrued dividends.

The Company was formed to acquire certain assets of The Marconi Wireless Telegraph Company of America and all wireless inventions, present and future, of the General Electric Company of New York.

R.M. Radio Limited

Registered.—September 6th, 1919.

Head Office and Engineers' Offices and Show-rooms.—5, Regent Square, Gray's Inn Road, W.C.1.

Directors.—H. R. Rivers-Moore, W. H. Merriman, L. J. Graham, A. G. Ionides, C. N. Rivers-Moore.

Secretary.—W. H. Merriman.

Capital.—£10,000.

The Company was formed for the purpose of constructing, supplying, maintaining and operating radiotelegraphic and telephonic apparatus of all kinds for the purpose of intercommunication on land, at sea, and in the air.

Radio Station, Marconi Société Anonyme.

Incorporated.—February, 1922.

Head Office.—Hotel Principal des Postes, Berne, Switzerland.

Directors.—Dr. F. Truessel (President), Henry W. Allen, Dr. Fürer (Director-General of Telegraphs), M. Chapuisat, M. Usteri, M. Schmidlin, Herbert A. White.

Manager.—Dr. F. Rothen.

Capital.—1,800,000 francs, divided into 3,600 shares of 50 francs each.

The Company has been granted a concession by the Swiss Government for the operation of a station at Berne and it conducts commercial wireless telegraph services with England, Spain and other European countries.

Financial Year.—Ends December 31st.

Russian Company of Wireless Telegraphs and Telephones (The)

Incorporated.—October 8th, 1908.

Head Office.—14, Lopouchinskaja, Petrograd, Russia.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., G. C. Isaacs, S. M. Eisenstein, Pierre de Balinski, M. Salberg, Lt.-Col. Adrian Simpson, C.M.G., R.E. (Managing Director), Admiral I. F. Bostrem, I.R.N. (retired), L. M. Eisenstein (Deputy Director).

Secretary.—Leon Eisenstein.

Capital.—Originally 1,200,000 roubles in 12,000 shares of 100 roubles each. This capital was increased to 1,800,000 roubles in November, 1911, in order to enable the Company to acquire a license from Marconi's Wireless Telegraph Company, Limited. The capital was further increased in 1913 to 2,400,000 roubles, and in 1914 to 3,000,000 roubles, divided into 30,000 shares of 100 roubles each.

The financial year ends December 31st (Russian date).

Dividends.—In respect of the years 1912 and 1913 dividends of 6 per cent. have been paid and 15 per cent. in respect of 1914 and 1915, and 17 per cent. for 1916.

The Company owns the Russian patents taken out in the name of S. M. Eisenstein, and also holds an exclusive license to use and exploit the Marconi Company's patents in Russia (excluding stations for international communication or on vessels of Russian Mercantile Marine).

The works belonging to the Company were nationalised by decree of the Bolshevik Government in 1918, and since that time have been under Bolshevik control.

Società Anonima Fiumana per le Radio Comunicazioni

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Ing. Giovanni Rubinich, Prof. Arturo De Meichner.

Censors.—Avv. Ernesto Franchi, Sig. Giovanni Santini, Sig. Giulio Bresci, Sig. Annibale Ploech.

Capital.—L150,000—(Authorised L1,500,000).

Società Italiana Dei Servizi Radiotelegrafici e Radiotelefonici

Head Office.—Corso Umberto 1, 271, Rome.

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Senatore Angelo Salmoiraghi, Senatore Ernesto Presbitero, Generale Maurizio Mario Moris.

Censors.—Comm. Cesare Cazzulini, Comm. Francesco Pages, Mr. Arthur Cappelaere.

Joint Censors.—Ragioniere Mario Fogliani, Avv. Michele Di Rienzo.

Capital.—L1,000,000.

Société Anonyme Internationale de Télégraphie Sans Fil

Incorporated.—March 31st, 1913.

Head Office.—13, Rue Bréderode, Brussels.

Capital.—4,500,000 francs, divided into 9,000 shares of 500 francs each, all issued and fully paid. The last dividend paid was 15 per cent. for the year 1921.

The financial year ends at December 31st.

The Company exploits wireless telegraphy on vessels of the mercantile marine of all European countries excepting the United Kingdom of Great Britain and Ireland, Germany, Austria-Hungary, Italy and France, and at the present time owns and operates wireless telegraph apparatus on nearly 600 vessels.

Société Belge Radio-Electrique, Société Anonyme.

Incorporated.—October 4th, 1922.

Head Office.—4, Rue d'Egmont, Brussels.

Directors.—M. Félicien Cattier (Président), M.M. Henri Baron Lambert, de Formanoir de la Cazerie, Léon Baron de Steenhault de Waerbeek, Em. Girardeau, Baron Léon Greindl, Maurice Hulin, Godfrey Isaacs, Gaston Périer, Maurice Travailleur, Henry Urban, Firmin Van Brée, Jacques Van Hoegaerden.

Managing Director.—Mr. Maurice Philippson.

Capital.—4,000,000 Francs, divided into 8,000 shares of 500 francs each.

Société Française Radio-Electrique, Société Anonyme

Incorporated.—April 4th, 1910.

Head Office.—79, Boulevard Haussmann, Paris.

Laboratory and Works.—Levallois-Perret (Seine), 2, Quai Michelet.

Big Machine Works.—Belfort : Société Alsacienne de Constructions Mécaniques.

Tower and Pillar Works.—Venissieux (Rhône), 72, Chemin du Moulin à Vent à Parilly.

Chairman.—M. Henri Bousquet.

Vice-Chairman.—M. G. Ferrand.

Financial Directeur.—M. A. Fondère.

Managing Director.—M. E. Girardeau.

Directors.—Comte de Beaumont, Baron de La Chevrelière, P. Desachy, A. Dupont, N. Pietri, O. de Rivaud.

Technical Manager.—Major P. Brenot.

Technical Advisers.—MM. Nethenod, Latour, Boucherot, de Bellescize, Petit.

Capital.—7,000,000 francs, divided into 70,000 shares of 100 francs each, all issued and paid up.

The Company manufactures wireless telegraph apparatus and engines, and erects wireless stations, and also owns and operates the patents of MM. J. Bethenod, E. Girardeau, M. Latour, etc.

It exploits chiefly that system of wireless telegraphy which employs high-frequency machines, the system adopted for all the great stations of France and its Colonies and by various other Governments.

Société Indépendante Belge de Télégraphie Sans Fil, Société Anonyme

Incorporated.—January 29th, 1920.

Head Office.—4, Rue d'Egmont, Brussels.

Directors.—M. Henri Baron Lambert (Président), MM. Van Hoegaerden le Baron de Steenhault, Maurice Philippson, de Formanoir, Wormser, Van Haltern.

Manager.—Major Roland.

Capital.—1,000,000 francs, divided into 2,000 shares of 500 francs each.

Société Indépendante de Télégraphie sans Fil

Head Office.—66, Rue la Boétie, Paris.

Works and Laboratory.—Malakoff 76 Route de Châtillon.

Administrators.—M. M. Boé (Président), F. Bézerie, Maurice, E. Wormser.

Manager.—Mr. Lezard.

Technical Advisers.—M. le Docteur L. Brillouin, G. Beauvais, Laüt, Pécnet.

Capital.—1,500,000 francs, divided into 3,000 shares of 500 francs each, issued and fully paid.

The Company manufactures wireless telegraph and telephonic apparatus, including valves, and constructs and maintains wireless stations, both land and ship. The Company operates the patents of R. Barthelemy, G. Beauvais, R. Brailard, L. Brillouin, R. B. Goldschmidt, P. J. Laüt, Pellin, Pelletier, etc.

Société Radiotechnique en Pologne (Radiopol) Société Anonyme.

Incorporated.—January 3rd, 1920.

Head Office.—22, Rue Wilcza, Warsaw.

Works.—"Strazar Works," 3, Rue Syrene, Warsaw.

General Manager.—Henryk Kolberg.

Directors.—Henryk Korwin Krukowski (President), Henryk Szampanier (Vice-President), Emile Girardeau, Godfrey C. Isaacs, Eugene Hannotiaux, Henryk Kolberg, Dr. Casimir Bajonski, Georges Osmolowski, Comte Henryk Potocki.

Technical Director and Engineer.—Mr. Joseph Pecquet.

Engineer.—Dr. Malecki.

The Company manufactures wireless telegraph and telephone apparatus and exploits the patents and licences relating thereto.

Svenska Radioaktiebolaget.

Incorporated.—July 29th, 1921.

Head Office.—Alstromergatan 12, Stockholm, Sweden.

Directors.—Mr. Axel Lindblad, Mr. Gustaf Dalen, Mr. Oscar Falkman, Mr. Inge Erichs, Mr. Gottlieb Piltz, Mr. Ulrich Salchow, Mr. Godfrey C. Isaacs, Lieut. Col. Adrian Simpson, Mr. G. E. Turnbull.

Manager.—Captain I. Wibom.

Capital.—Kr. 700,000 divided into 7,000 shares of Kr.100 each.

Wireless Speciality Apparatus Company

Incorporated.—June 14th, 1907, New York.

Head Office.—131, State Street, Boston.

Directors.—George S. Davis, William Newsome, Eugene W. Ong, C. B. Davis, R. H. Rice, E. P. Edwards.

President.—George S. Davis.

Vice-President.—William Newsome.

Secretary.—John L. Warren.

Treasurer.—E. C. Porter.

General Manager.—T. Johnson, Jr.

Chief Engineer.—William H. Priess.

Consulting Engineer.—Professor Greenleaf W. Pickard.

Capital.—\$492,000.

The fiscal year ends December 31st of each year.

The Company is engaged in the development and manufacture of radio apparatus and devices and of "Faradon" condensers for both high and low tension work, including condensers of special design for continuous wave radio apparatus.

BIOGRAPHIES

(A) Biographies.

(B) Obituary Notices.

BIOGRAPHICAL NOTICES

Abraham, Henri.—General Secretary of the Société Française de Physique, 1901 to 1913. now Professor of Physics at the Sorbonne in Paris.

Adalsteinsson, F.—Born at Akureyri, Iceland, December 30th, 1890. Since 1908 engaged in the Iceland Government Telegraph Service. Studied wireless telegraphy in Norway and Denmark in 1916 and 1917. Since February, 1917, Superintendent of Reykjavik Wireless Station and School. Supervised erection of four wireless coast stations in Iceland. Inspector of wireless installations in that country. Address, Loftskystodin, Reykjavik, Iceland.

Alexanderson, Ernst Fredrik Werner.—B. Upsala, Sweden, January 25th, 1878. Educ. at the High School and University of Lund, Sweden, and at the Royal Institute of Technology, Stockholm, completing a post-graduate course at Berlin. Entered the service of the C. and O. Electric Company, 1901. Joined the General Electric Company, 1902. Occupies the post of consulting engineer to the latter concern. Chief engineer Radio Corporation of America. Introduced iron into high frequency circuits, and originated the development of 2, 50 and 200 kw. radio frequency alternators and the magnetic amplifier. Also developed the "barrage" receiver and kindred inventions. Has carried on notable pioneer work in duplex radio telephony. Holds a number of United States patents. Member of the American Institute of Electrical Engineers. Fellow and President of the Institute of Radio Engineers. Author of over twenty scientific papers read before various technical societies. Address: Woolworth Building, New York.

Allen, Perry W. (1902).—B. 1870. Met Senatore Marconi, 1896. Assisted (1897) in formation of the Wireless Telegraph and Signal Co., Ltd., afterwards becoming secretary to that company. Secretary of Marconi International Marine Communication Co., Ltd., and Assistant Manager of Marconi's Wireless Telegraph Co., Ltd. (1900). Deputy Manager. Marconi's Wireless Telegraph Co., Ltd. (1910). Elected to a seat on the Board of each company, 1917. Joint General Manager, Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. (1919). Address: Marconi House, Strand, W.C.2.

Appleby, Thomas.—B. May 10th, 1886, near Newcastle-on-Tyne, England. Arrived in America, 1888. Commenced wireless experiments, 1899. Went to sea, 1909, as radio operator. September, 1909, in charge of United Wireless Station at Atlantic City, N.J. April, 1912, in charge of Wanamaker-Marconi Service between New York and Philadelphia Wanamaker Stores. April 9th, 1917, commissioned in the U.S. Navy as a Lieutenant (J.G.) for Radio Engineering. Spring of 1918, established shore radio compass stations for the detection and location of enemy vessels in West Atlantic. Spring of 1919, selected sites for shore radio compass stations on the Pacific Coast of the United States. April 24th, 1919, promoted Senior Lieutenant, U.S. Navy. August 7th, 1919, released from active duty,

U.S. Navy. August 8th, 1919, Radio Engineer in the Office of the Director of Naval Communications and given entire charge of all shore radio compass stations in the United States. November 15th, 1919, resigned from Navy Department to enter profession of Patent Lawyer. M.I.R.E. (Amer.). Address: 5847, Ellsworth Street, Philadelphia, Pa., U.S.A.

Appleton, Edward Victor, M.A. (Cantab. D.Sc. (Lond.))—B. Bradford, 1892. Educ. St John's College, Cambridge. First-class Honours in National Science Tripos, Parts I. and II. (Physics). Served European War, 1914-1919, as Captain W/T, R.E. Specially interested in Thermionic Valves. Engaged in Valve Research, Cavendish Laboratory, Cambridge. Contribution on Valves in *Philosophical Magazine and Radio Review*. Member of Thermionic Valve Sub-Committee, Radio Research Board, Department of Scientific and Industrial Research. Fellow of St. John's College, Cambridge. Member Physical Society of London, Cambridge Philosophical Society. Address: St. John's College, Cambridge.

Arco, Graf Georg von.—B. Grossgorschütz, Schlesien. Educ. at Berlin University and Technical High School, Charlottenburg. Assistant to the late Professor Slaby in the department of wireless telegraphy, 1898; later joined the Allgemeines Elektrizitäts-Gesellschaft, Berlin, continuing at the same time his work on the Slaby-Arco system of wireless telegraphy. Manager of the Gesellschaft für Drahtlose Telegraphie, 1903. Carried out practical wireless telephony over a distance of 35 km. 1906. Exhibited high frequency alternator with static frequency step-up transformers at the International Radiotelegraph Congress in London, 1912. This arrangement is now used in the high power station of Nauen, generating 400 kw. in the aerial. Address: Tempelhof, Berlin, Albrechtstrasse, 49/50.

Armstrong, Edwin H.—B. in U.S.A., December 18th, 1890. Graduated at Columbia University in 1913. Has undertaken radio-telegraphic work in conjunction with Professor Pupin at the Columbia Laboratories. Director of the Institute of Radio Engineers. Recently awarded the medal of the Institute. Served two years in A.E.F. as Captain and Major in the Signal Corps. Decoration: Chevalier Legion d'Honneur. Professor at Columbia University and President of the Radio Club of America. Address: Columbia University, New York City.

Asano, Dr. Osuke.—B. 1859. Graduated at the Engineering College of the Tokyo Imperial University, 1881. Honorary Professor, Tokyo University. Director of the Electro-Technical Laboratory of the Department of Communications, 1897. Retired, 1919. Took many trips to Europe and America, first for the investigation of electrical engineering; second as a Japanese delegate of the International Wireless Telegraph Conference, Berlin, 1906; and third as a Japanese delegate of the International Conference on Electrical Units and Standards, London, 1908. The so-called "Telshinsho" wireless system is due to his investigations.

Laid the submarine cable between Formosa and Osumi in 1895-97, the first long-distance submarine cable ever laid by a Japanese. Raised to the rank of Dr. Engineer, 1899. Supervises all electrical works in Japan. Awarded 2nd Order of Merit, 1914. Address: 148, Kogaicho, Azabu, Tokyo.

Asin, Don Humberto de.—Studied electricity at the University of Santiago. Chief of important technical sections, railways of Guayaquil and Arica at La Paz. Studied radio-telegraphy. Visited San Cristobal, Lima, the School of Santiago, and the two installations which were then at the Docks, Buenos Aires. Commissioned by Bolivian Government to visit Europe. Graduated as radiotelegraphist at the Marconi Company's professional school at Broomfield. Visited Germany to study the Telefunken system. Installed six stations in Bolivia and Trinidad, Cobija. Villa Bella, Concepcion, Magdalena, San Ignacio, Puerto Suarez, Santa Cruz, Todos Santos and many more. Engineer-in-Chief of the Radiotelegraph Service of Bolivia.

Athanasiadis, Capt. Constantin, H.R.N.R., B. Athens, 1878. Educ. Royal Naval College, 1892-96. Torpedo and Electrician Officers' School, 1906. Commissioned in the Navy, 1896, and after eleven years' active service became interested in wireless telegraphy. Supervised the erection of the first wireless installations in Greece. Sent to London, 1909, for a year and a half, by his Government as the head of a mission for the construction of Greek wireless stations. During that period came into close contact with the Marconi organisation. On his return to Greece he was appointed head of the Radiotelegraph Service of the Navy. In November, 1920, he resigned his commission in the Royal Navy, and in 1921 became sole agent for Greece of Marconi's Wireless Telegraph Co., Ltd., and of the Société Anonyme Internationale de T.S.F. Author of Handbook of Wireless Telegraphy, Vol. 2, Elementary Treatise of Wireless Telegraphy (in Greek). Address: Athenian Club, Nikis St. 45, and Adrianou St. 14.

Austin, Louis Winslow, Ph.D., D.Sc.—Son of Professor L. A. Austin, of Middlebury College. Educ. Middlebury College, Clark's University, and the Universities of Strasburg and Berlin. Assistant Professor of Physics at the University of Wisconsin, then joined the staff of the Physikalisches-Technische Reichsanstalt, Berlin. Specially interested in quantitative high-frequency measurements. Head of the U.S. Naval Radiotelegraphic Laboratory, Washington, D.C., since 1903. Delegate to the London International Radiotelegraphic Conference. President I.R.E., 1914; Vice-President of the International Union for Scientific Radiotelegraphy; Delegate to the Radiotelegraphic Technical Conference, Paris, 1921. Address: Radio Building, Bureau of Standards, Washington, D.C.

Ballantine, Stuart.—B. September 22nd, 1897, Philadelphia, Pa. Educ. Philadelphia Public Schools, studied mathematics at Drexel Institute. Engaged in electro-chemical research. H. K. Mulford Company, 1916; and telephone engineer, Bell Telephone Company, 1916-17. Took up development of radio compass for U.S. Navy Department, and was in charge of this work from 1917-20. At present pursuing special studies in mathematical physics at Harvard University. Address: 15, Sumner Road, Cambridge, Mass., U.S.A.

Bangay, Raymond D.—B. Lyme Regis, 1883. Educ. Epsom College and Finsbury Technical College. Joined the Marconi Company, 1902. Spent five years in America, during which time was engaged in different branches of the Service. Returned to England and studied Military Wireless Stations. Chief of the Field Station Department, Marconi's Wireless Telegraph Co., Ltd., 1914. Chief of Designs Department, of the same company, 1921. Author of "The Elementary Principles of Wireless Telegraphy" and "The Oscillation Valve." Address: Gresham Cottage, Brentwood, Essex.

Bardeloni, Colonel C.—B. in Brescia, 1871. Graduated from the Milan Polytechnic in Civil Engineering (1884), and in electrotechnic from the Turin Polytechnic (1901). Commendatore della Corona d'Italia and Cavaliere dei S.S. Maurizio e Lazzaro. Ufficiale della Légion d'Honneur. Received decorations of bronze medal, Italian and French war cross, etc. Organiser of the first wireless telephone experiments in the Italian Army and of radiotelegraphy for airships (1910). Instructor of wireless telegraphy at the W.I. Military Institute in Rome (1911-1916). Attached to the Headquarters from 1917 to the end of the war for the direction of wireless telegraph services. At present Director of the Army Wireless Telegraph Services. Member of the London International Wireless Telegraph Conference (1912); of the International Time Signals Conference in Paris (1913); of the Paris Inter-Allied Commission during the war; of the electric communications Inter-Allied Conference (1920); and of International Radiotechnic Committee in Paris (1921).

Baume, J. De la.—Began wireless career as midshipman of the French Navy in 1901, and was in the radio service of the North Squadron and 2nd Naval Division (Brest) in succession. In 1906 transferred to the Merchant Service and acted as Instructor of Radiotelegraphy to the personnel of merchant ships. In 1914 mobilised and attached to various radio services of the Navy and Military connected with the port of Toulon. In 1915 became Member of the Marine Nationale, Commission d'Etudes Pratiques de T.S.F. Toulon-Mourillon. Address: Commission d'Etudes Pratiques de T.S.F. Toulon-Mourillon.

Beggerow, Dr. Hans.—B. 1874. Educ. University of Berlin and Freiburg-in-Breisgau, where he obtained his Doctorate. From 1901 till 1919 chief expert adviser to the German Admiralty in all matters concerning wireless telegraphy. Similar position in the Prussian Army, 1906-14. Delegate of the Imperial German Government to the three International Radio Conferences of 1903, 1906, and 1912. Retired November, 1919. Occupied with private scientific work only. Member Deutsche Gesellschaft, 1914. Berlin - Wilhelmstrasse. Deutsche Physikalische Gesellschaft. Address: Berlin, W.15, Meierottostr. 3.

Bellini, Dr. Ettore.—B. Foligno, Italy, April 19th, 1876. Educ. Naples University. Electrical Engineer to the Royal Italian Navy, 1901. Chief of the Naval Electrical Laboratory at Venice, 1906. Responsible for carrying out research work dealing with the employment of wireless telegraphy on warships and submarines. Joint inventor with Capt. Tosi, of the Radiogoniometer.

Bethenod, J. F. J.—B. Lyons, 1883. Educ. Central School of that city. For a number of years acted as the Assistant of Professor André Blondel. From 1903 onward, published a large

number of theoretical articles on Electro-Dynamic Machinery, and has entered into business relationship with a number of Constructional Engineering Houses for the exploitation of his inventions. After a term of military service in the Engineers, specialised in wireless telegraphy. In this field, both scientific investigation and industrial practice owe several important contributions to his activities. Of recent years his attention has been turned to high frequency alternators, and he has built machines giving remarkable results. Consulting Engineer to the French Société Radio-Électrique.

Bhering, Francisco.—B. Uberaba, State of Minas Geraes, Brazil, January 1st, 1867. Under his initiation and supervision survey and mapping of Brazil undertaken in unified maps on the scale of one millimetre per kilometre. Represented Brazil as delegate at the International Telegraphic Conference of 1903, at the Radiotelegraphic Conference, London, in 1912, and at the Time Conference, 1912. Member of the mixed Civil and Military Commission organised to deal with wireless matters. Professor of Geodesy and Astronomy in the Polytechnic School of Rio de Janeiro. Director of the Technical Branch of the Telegraphic Administration. Author of a number of works on civil engineering, geography, and telegraphy. Address; Rua Conde Irajá No. 111, Rio de Janeiro, Brazil.

Binyon, Major Basil, O.B.E., M.A.—B. Ipswich, April 23rd, 1885. Educ. Leighton Park, Reading; Trinity College, Cambridge. Natural Science Tripos, 1907, and post graduate course Electrical Engineering. Appointed engineer to Cie. Generale Radiotelegraphique of Paris, 1911. Appointed General Manager Anglo-French Wireless Co. Granted commission in R.N.A.S., 1914. Appointed Officer-in-Charge Wireless Experimental Department of R.N.A.S., 1916. Promoted Squadron Commander, 1917. Awarded O.B.E. (military), 1918. Appointed Major R.A.F. M.I.R.E. Managing Director Radio Communication Company, Ltd. Director of C. F. Elwell, Ltd., Mullard Radio Valve Co., and Radio Press. Vice-Chairman, Radio Society of Great Britain. Address: 34, Norfolk Street, Strand, W.C.2; "Hawthorndene," Hayes, Kent.

Bion, Capitaine de Corvette.—B. Gazeran (Seine-et-Oise) 1881, and has studied in Paris at College Hanisler. Entered l'Ecole Navale 1899, and took a course at l'Ecole Supérieure d'Électricité de Paris. Prof. of Electrotechniques at l'Ecole Navale 1912-1914. Director of the second Naval Zone of T.S.F. (between Gulf of Gascoyne and the Channel), from 1914-1917. In charge of various radiotelegraphic missions between the Allies. Director of Scientific Research of the naval staff. Member of la Société Française de Electriciens, Française de Physique, des Amis de la T.S.F., The Institute of Radio Engineers, and la Société des Agriculteurs de France. Officer of the Legion of Honour, K. of the British Empire. Address: Chateau de Gazeran (Seine-et-Oise) France.

Bjarnov, Alexander William.—B. Copenhagen, 1874. Studied Polytechnic Academy, Copenhagen. Attached to the Telegraph Dept. since 1903. Passed through the Naval and Torpedo Department Spark Telegraph School for Officers in 1907. Since 1909, together with Helmuth Schledermann, has supervised the examination of wireless operators and the inspection of wireless stations on board ships flying the Danish flag. Engineer-in-Chief of the Danish Telegraph

Dept., Third Engineering District; Fellow of Danish Engineers' Association and of the Electro-technic Association (Elektroteknisk Forening); member of the Board from 1911 to 1919; Associate of the American Scandinavian Foundation. Address: Gl. Kongevej 96, Copenhagen V.

Bjoerkman, S. O. V.—B. 1883. Since 1911 Superintendent of the Wireless Stations at Nya Varvet, near Gothenburg, Sweden. Address: Nordhemsgatan 33, Gothenburg.

Blandy, Col. Lyster Fettiplace, D.S.O., R.E.—B. September 21st, 1874. Educ. Haileybury College and Royal Military Academy, Woolwich, Entered Royal Engineers, March, 1895; Captain, 1904; Major, 1914; Brevet Lieut.-Col., 1917; Col., R.A.F., 1919; Lieut.-Col., R.E., 1921. From 1908-12, Inspector Royal Engineers Stores at Woolwich, during which period had much to do with Army Field Wireless Sets. In the beginning of 1913 commanded the Wireless Signal Company at Aldershot. From 1914-17 in charge of Wireless Communication of the B.E.F., France. Became Chief Experimental Officer of Army Signals Experimental Establishment, July, 1917. Chief Experimental Officer, R.A.F., April, 1918, and thence transferred Controller of Communications of the Air Ministry; Head of the British Delegation to the International Technical Committee on Radio-Communication, Paris, 1921; Officer of the Legion of Honour; Chevalier of the Order of the Crown of Belgium; Mons Star with bar; General Service and Victory Medals; Croix de Guerre of Belgium. Address: Naval and Military Club, London.

Blondel, André E.—B. Chaumont, France, 1863. Graduated at Paris University. Contributor to learned societies and technical journals on several subjects, including wireless telegraphy. Invented (1893) a new apparatus, which is known as the "Oscillograph," and which opened a fresh field for the study of alternating currents. Was the first to explain, mathematically (1893), the effect of inertia in the hunting of alternators. Among his other activities in wireless telegraph, mention should be made of directed waves produced by a double aerial oscillating on the fifth harmonic, and also of a system of acoustically syntonic wireless telegraphy.

Blondlot, Professor Prosper René.—B. Nancy, 1849. After completing his scientific studies in Paris, returned to Nancy. Became Professor at the Faculty of Sciences. Now Hon. Professor and Correspondent of the Institute of France. Devoted considerable study to the problem of electromagnetic waves, the main object of his researches being to determine the speed of propagation of such waves. In 1891 he found for this speed the value 302,200 km. per second, and, in 1893, by another and quite different method, the value 297,200 km. per second. Has also investigated the laws of propagation of wireless waves in various media.

Bouthillon, Léon.—B. 1884. Pupil of l'Ecole Polytechnique (Paris) from 1903-1905. Apprenticed to the Engineering Dept. of the Posts and Telegraphs. Engineer of Posts and Telegraphs in 1908, and was attached to the service of la Télégraphie Sans Fil. In 1911 was nominated Director of Service de T.S.F. de l'Administration des Postes et Télégraphes. Completed the network of coast stations and established them on a sound basis. He represented France as delegate at the radiotelegraphic conference in London, 1912. In 1920 was nominated Engineer-in-Chief of Posts and Telegraphs. Left

the administration of Posts and Telegraphs for private industry. Was General Inspector of Exploitations of La Compagnie Générale de T.S.F. of the affiliated companies and associations. Was Prof. of T.S.F. at l'Ecole Professionnelle Supérieure des Postes et Télégraphes. From 1913-1920 was engaged in various matters of conferences in l'Ecole Supérieure d'Électricité, Paris. He was organizer of l'Administration Française, then the Grandes Compagnies and Associations des Ecoles de T.S.F. Has been Instructor of Physics at l'Ecole Polytechnique in Paris since 1913. Has published a number of technical and scientific articles on radio-communications. He has written, in collaboration with G. E. Pétit, a work entitled "La Télégraphie sans Fil." He is also the author of an important treatise in 8 volumes entitled "La Théorie et la Pratique des Radiocommunications." The Academy of Sciences at Vienna in 1920, the Herbert Prize for works relating to T.S.F. Address: Ingénieur des Télégraphes, Bureau du Service Central de la T.S.F., 25, Rue Boissnadé, Paris.

Boys, Charles Vernon, F.R.S.—Educ. Marlborough, Royal School of Mines, Gas Referee. Author of "Soap Bubbles" and of numerous papers published by the Royal Society and others. Edited and compiled "Dynamometers" by the late F. J. Jervis-Smith. Officier de l'Instruction Publique (France); Hon. Member New York Academy of Sciences; also of Physical Society, Moscow; Past President, Physical Society of London and Röntgen Society. Addresses: St. Marybourne, Andover, Athensum and Royal Automobile Clubs, and 66, Victoria Street, S.W.1.

Bradfield, William Walter, C.B.E.—B. London, 1879. Entered the Wireless Telegraph & Signal Co., Ltd., 1897. Electrical assistant to Senatore Marconi all through the course of the latter's experimental work in Radiotelegraphy on Salisbury Plain during 1897. Installed the first wireless apparatus on British battleships, 1899, and a little later assisted in demonstrations to the United States Government on board the United States battleship "Massachusetts." In 1901 similar demonstrations conducted by him for the French Government resulted in the establishment of wireless communication between the French Riviera and Corsica. Supervised in 1901 the erection of the station at Siasconset and the Nantucket Lightship. Chief Engineer to the Marconi Wireless Telegraph Co. of America, 1902. Deputy Manager of Marconi's Wireless Telegraph Company, and of the Marconi International Marine Communication Co., Ltd. Manager of both concerns, 1910. Elected to the Board of the two companies, 1917. Joint General Manager Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. Address: 1, St. James's Place, London, S.W.

Brailard, Raymond.—B. 1888, Dept. of Jura, France. Studied engineering at the Ecole des Arts et Métiers, Cluny, and Ecole Supérieure d'Électricité, Paris, 1907. Two years in the electrical industry. Military service at the Eiffel Tower Wireless Station, 1910. Engineer of the Société Française Radio-Électrique, 1911. Visited Belgian Congo as Chief Engineer of Wireless Telegraphy and installed the network of Congolese Station, 1911-12. Installed the station at Laeken, near Brussels. Secretary of the International Commission on Scientific Wireless Telegraphy, 1913-14. During the war attached first to the Wireless Service of the Belgian Army, then to

the Wireless Station at Croix d'Hins (Bordeaux). Technical manager of the Société Indépendante de T.S.F., 1919. Author of several scientific papers. Technical Manager of the Société Indépendante Belge de Télégraphie sans fil and Consulting Engineer of the Belgian Congo Wireless Service. Address: 23, Boulevard de Waterloo, Bruxelles.

Branly, Edouard.—B. Amiens, October 23rd, 1844. Educ. St. Quentin College and Henry IV College, Paris. Fellow of the University, Doctor of Physical Science, and Doctor of Medicine. Some of his patents of 1890 and 1891 relate to the electrical conductivity of radio-conductors and to the operation of a local relay circuit from a distance. International Jury of Superior Precept Instruction awarded him (1900) *grand prix* for his exhibition of radio-conductors. French Minister of Public Instruction made him an Officer of the Legion of Honour in recognition of the part he had played in connection with the discovery of "Wireless Telegraphy." Has constructed various independent distributing apparatus for producing tele-mechanical effects without wires. Elected a member of the Academy of Science, Paris, January, 1911. Address: 21, Avenue de Courville, Paris.

Bredow, Hans, Doctor.—B. 1879. Entered the service of the Telefunken Co., as an engineer in 1904, and took over the management jointly with Count Arco in 1908. Joint founder of a number of wireless companies namely: Australasian Wireless, Ltd., Sydney (1909); Deutsche Betriebsgesellschaft für drahtlose Telegraphie (Debeg), Berlin (1911); Atlantic Communication Co., New York (1911); Deutsche Sudan-Gesellschaft für drahtlose Telegraphie, Berlin (1912); Société Anonyme Internationale de Télégraphie sans fil Brussels (1913); Amalgamated Wireless Australasia, Ltd., Sydney (1913); Drahtloser Urbersee-Verkehr A.G. (Transradio), Berlin (1913). In 1919 he entered the service of the State and now directs as Secretary of State the Telegraph, Telephone and Wireless service of Germany.

Brenot, Commandant Paul.—B. Ruoms, Ardèche, September 19th, 1880. Educ. Ecole Polytechnique. Transferred to the Central Establishment of Radiotelegraphy. Represented wireless telegraphy at the International Electrical Congress at Marseille, 1908, and later on collaborated with M. Blondel in various investigations into radiogoniometry and high tension arcs for wireless telegraphy and telephony. Carried through some important experiments on the employment of wireless telegraphy in aircraft, 1910-11, which gained him the Cross of the Legion of Honour. Technical adviser to the Minister of the Colonies, 1911. Delegate of the Colonial Office at the International Radiotelegraphic Conference, London, 1912; at the International Time Conference, Paris, 1912-13; and at the International Safety-at-Sea Conference, London, 1913-14. During the war, whilst remaining in charge of French Colonial wireless, appointed head of the Radiotelegraphic Centre at Paris and of the Eiffel Tower Station. Left Army, 1919. Became Technical Manager of the Société Française Radio-Électrique and of the Compagnie Générale de Télégraphie sans Fil. Address: Cie. Générale de T.S.F., 79, Bvd. Haussmann, Paris (8e).

Bright, Sir Charles, F.R.S.E.—B. London, 1863. Educ. Lancing College and King's College. Engineer and Electrician for the construction, testing, laying and repairing of over 25,000 miles of submarine cable. Principal of Sir Charles

Bright & Partners, Consulting Engineers, 146, Bishopsgate, E.C.2. Gave special expert evidence before Inter-Departmental Cables Communication Committee (1902), House of Commons Radiotelegraphic Committee (1907), and Dominions Royal Commission (1911). Member of R.F.C. (Air) Enquiry Committee (1916), and of British Association War and Engineering Committee (1916). Official delegate at Air Conference (1920 and 1922). Contributed papers, addresses and lectures to numerous learned societies technical journals and reviews. Author of "Submarine Telegraphs," "The Story of the Atlantic Cable," "The Administration of Imperial Telegraphs" and "Telegraphy, Aeronautics and War." Represented Australia as sole delegate at the International Radiotelegraphic Conference (1912). Vice-President, Radio Society of Great Britain and Institute of Aeronautical Engineers. Addresses: Leigh Grange, Tonbridge, and Athenæum Club, Pall Mall, London, S.W.1.

Brillouin, Léon Nicolas.—B. 1889 at Sevres (Seine-et-Oise). Pupil of L'Ecole Normale Supérieure (1909-1913). Licentiate of Mathematics and Physics. Fellow in Physics and Chemistry (1913). Sub-lieutenant of the 8th Engineers of l'Etablissement Central de Radiotélégraphie (1914-1919). Prof. of l'Ecole Supérieure de T.S.F. Doctor of Science (1920). Engineer of the Société Indépendante de T.S.F., Paris. General Secretary of "Journal de Physique," Paris. Address: 30, Quai du Louvre, Paris I.

Brown, Frank James, C.B., C.B.E., M.A., B.Sc.—B. 1865, near York. Educ. privately. Grad. London University (Honours and Prizeman). Entered the Higher Division of the Civil Service, 1886. Appointed to the Post Office. Principal Clerk, 1910. Assistant Secretary in charge of Telegraphs, March, 1919. Member of British Peace Delegation, 1919, in capacity of expert adviser on telegraph questions. Post Office representative on Imperial Communications Committee, and Member of Wireless Telegraph Sub-Committee of that Committee. Member of Imperial Wireless Telegraphy Committee appointed by Government in 1919 to formulate a scheme of W/T for the Empire. Senior British Delegate to Conference at Washington on Telegraph Communications, 1920. Expert adviser on Telegraph questions at Arms Conference, Washington, 1921-22. Commander of the Dannebrog. Address: G.P.O., London.

Brown, Sidney George, F.R.S.—B. 1873, Chicago, U.S.A., of English parents, and brought to England when eighteen months old. Educ. Harrogate and London University. Made a special study of submarine telegraphy and is inventor of the magnifying cable relay. Invented the drum cable relay and the magnetic shunt, 1898. Since that date he has also devoted much attention to telephony and wireless telegraphy and has achieved some important results, such as the carbon telephone relay telephone transmission on land trunk lines, the improved wireless telephone receiver, and other inventions. Vice-President of the Radio Society of Great Britain.

Bucher, Elmer E.—B. Akron, Ohio, November 11th, 1885. Educ. Academy Oberlin, Ohio. Joined the De Forest Wireless Telegraph Company as experimental engineer, 1903. Constructed several high-power stations in the Middle West and on the Gulf Coast for this firm. Joined the United Wireless Telegraph Company as installation and experimental engineer, 1907. Installed the first ship stations

of the United States Navy. Organised the United Wireless Telegraph Company's School, 1909. Instructing engineer and chief inspector of that company for more than two years. Associated himself with the Y.M.C.A., New York, in the initiation of wireless schools, 1910. Joined the Marconi Wireless Telegraph Company of America as instructing engineer, 1912. Organised Marconi Institute, 1917, and acted in capacity of Director. Joined Commercial Department, Radio Corporation of America, 1920. Held position as Technical Editor of "Wireless Age" during the period 1913-18. Author of "Practical Wireless Telegraphy," "Vacuum Tubes in Wireless Communication," "Wireless Experimenters' Manual," and other works. Member of the Institute of Radio Engineers.

Bullard, Rear-Admiral W. H. G., U.S.N.—B. December 6th, 1866, State of Pennsylvania, U.S.A. Graduated, United States Naval Academy, 1886. Served on ships of the Navy on the Atlantic, South Atlantic, Pacific and Asiatic Stations, with shore duty, with particular reference to the science of Electrical Engineering, in which he had specialised. First Superintendent of the Naval Radio Service, 1912-16. Delegate-plenipotentiary of the United States at the International Conference for Safety of Life at Sea, London, November, 1913. In charge, on behalf of the United States Navy, of the wireless operations contained in the series of experiments carried out between the Eiffel Tower and Arlington to determine longitude by means of wireless telegraphy. During the War his sea service was in the Sixth Battle Squadron of the British Grand Fleet, serving in the North Sea. After the war he returned to Washington in charge of the Communication Service of the Navy Department, with the title "Director Naval Communications," the former Radio Service having been enlarged to include all forms of communication.

Burstyn, Dr. W.—B. Austria, 1877. Educ. Vienna University. Started his career as electrical engineer with the Siemens-Schuckert Werke, Charlottenburg. Later engineer with Gesellschaft für Drahtlose Telegraphie and others. Wireless engineer with the Russian navy in the Russo-Japan war. Developed together with Baron Lepel (1907-12) the quenched spark system. Proprietor of a Techno-Physical Laboratory. Late *privat-docent* for wireless telegraphy and electric clinics. Technical High School, Charlottenburg. Now Chief Engineer with the Allg. Els. Ges. Berlin. Many publications, especially regarding Wireless and electric switching, in "Jahrbuch für drahtl. Tel." etc., and other papers. Address: Berlin—Wilmsdorf, Prinzregentenstrasse, 23.

Carpentier, Jules.—B. Paris, 1851. Joined Ecole Polytechnique, 1871. Commenced work with the State Railways. In 1876 appointed Principal Stores Engineer of Lyons Railway Company. For his electrical work shown at the Electrical Exhibition of 1881, he obtained the Gold Medal and the Cross of Chevalier of the Legion of Honour. Later became President of several learned Societies. Entered the Bureau des Longitudes, 1897. Interested himself from the beginning in radiotelegraphy. Founder of the Compagnie Générale Radiotélégraphique, which was later absorbed by the Compagnie Générale de Télégraphie sans Fil. Member of the Académie des Sciences, Bureau des Longitudes, Commander of the Legion of Honour, President of the Société de Publications Radiotechniques.

Chaffee, Professor E. L.—B. April 15th, 1885, Somerville, Mass. Educ. High School, Somerville, and Massachusetts Institute of Technology in Boston. Graduated B.S. in Electrical Engineering, 1907. Awarded the degree of M.A. in Physics, Harvard University, 1908, and Ph.D., 1911. Conducted courses in physics and radiotelegraphy at Harvard University. Engaged in research and consultation work in radiotelegraphy, Assistant Professor of Physics, Harvard University. Author of several papers, including "A New Method of Impact Excitation of Electric Oscillations and their Analysis by the Braun Tube Oscillograph," published 1911. Physical Laboratory Manual, paper on "Electrical Response of the Retina to Stimulation by Light," "Regeneration in Coupled Circuits," etc. Fellow Academy of Arts and Sciences (Amer.), Fellow and Vice-Pres. I.R.E. (Amer.), Member Physical Soc. (Amer.), Member Optical Soc. (Amer.). Research Fellow of Cancer Commission, Harvard Univ. Address: Cruft, H. T., Elect. Laboratory, Harvard University, Cambridge, Mass.

Chamberlain, Eugene Tyler.—Son of General Frank Chamberlain. B. in Albany, N.Y., September 28th, 1856. Educ. Albany Academy and Harvard College. Graduated with honours in Metaphysics, 1878. In business for two years, then took up journalism and acted as legislative and political correspondent to the Associated Press. Came to Washington, 1893. Appointed Commissioner of Navigation by President Cleveland. In 1903, on the creation of the Department of Commerce and Labour, he joined others in urging the importance of wireless telegraphy as a means of promoting safety of life on merchant vessels at sea, and he has since played a prominent part in promoting legislation on this subject. Delegate for the U.S.A. to the Convention on Safety of Life at Sea, at London, 1914. Address: Department of Commerce, Bureau Navigation, Washington, D.C.

Childs, H. B. T.—B. Llandilo, S. Wales, 1884. Educ. King's School, Canterbury; London University. Joined the Marconi Company, 1905. Served as Engineer in Russia, Canada, Spain, and Egypt. Joined Royal Flying Corps, autumn, 1915. Served in France, November, 1915, to August, 1917. Appointed to command W/T Experimental Establishment, R.A.F., August, 1917. Promoted Lieut.-Col., December, 1917. Appointed in charge of W/T for the R.A.F. in France, May, 1918, till April, 1919. Mentioned in despatches, 1916, 1918. Chief of Field and Air Division, Marconi's Wireless Telegraph Co., Ltd. Address: Holdenhurst, Otlands Avenue, Weybridge.

Chevrelière, Jean Marie Charles Aymé, Baron de la.—B. Poitiers, France, 1858. Educ. in that city. Member of Parliament, Mayor and General Counsellor. After a course at the Military Academy of St. Cyr (1877-79), followed by specialised training at Saumur, remained for fifteen years in the active army as cavalry officer, retiring with the grade of captain in the Reserve, 1892. Member of Légion d'Honneur, Military class. Mobilised from August 2nd, 1914, to July 5th, 1917. Joined the Board of the Belgian "Société Anonyme de T.S.F.," 1901, and subsequently took a prominent part in the initiation of the "Compagnie Française Maritime et Coloniale de T.S.F.," now known as "Compagnie Industrielle de Mécanique et d'Electricité," of which he is President and Managing Director. From early 1914 to the end of January, 1918, occupied the post of managing director of the Cie Universelle de

Télégraphie et de Téléphonie sans Fil, which on February 12th of the same year was merged in the Cie. Générale de T.S.F., of which he is vice-president. Director of "Société Française Radioélectrique" and Vice-President of Cie. Radio Maritime. Also Director of "Cie. Radio France" and of "Cie. Sté. Franco Argentine." Address: 23, rue Dumont d'Urville, Paris. The Jockey Club and Nouveau Cercle.

Chree, Charles, F.R.S.—B. 1860, Linlathen, Forfarshire, Sc.D. of Cambridge, Hon. LL.D. (Aberdeen). Graduated M.A. Aberdeen (1879) with first-class honours in Mathematics and Natural Philosophy. At Cambridge, in 1883, was sixth wrangler, gaining also first-class honours in Mathematical and Natural Sciences Triposes. Fellow of King's College, Cambridge (1885); re-elected Research Fellow (1891), ex-President of Physical Society of London; Pres. Royal Meteorological Society. Pres. Section of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Obtained Watt Medal of Institution of Civil Engineers. Largely concerned with geophysics, especially terrestrial magnetism and atmospheric electricity. For his researches in the former subject received Hughes Medal from the Royal Society. Publications: "Studies in Terrestrial Magnetism," articles in "Encyclopædia Britannica." Address: 75, Church Road, Richmond, Surrey.

Cohen, Louis, Ph.D.—B. 1876. Educ. at Armour Institute of Technology, University of Chicago, and Columbia University. On scientific staff of the Bureau of Standards, 1905-09. Chief of Research Department of the National Electric Signalling Co., 1910-12. Engaged in consulting practice since 1912. Professor of Electrical Engineering, George Washington University. Especially interested in the subject of electrical oscillations. Author of "Formulae and Tables for the Calculation of Alternating Current Problems," and scientific and technical papers dealing with problems in wireless telegraphy and kindred subjects.

Coursey, Philip R., B.Sc. (Eng.)—B. 1892. Educ. University College, London. Awarded Diploma in Electrical Engineering with Distinction. Graduated with first-class Honours in Electrical Engineering at the University of London. Subsequently acted as Assistant to Dr. J. A. Fleming, F.R.S., in the Electrical Engineering Department and Research Laboratories of University College, London. From 1915-18 served as Inspector of Wireless Telegraph Apparatus for the Admiralty; afterwards appointed to the staff of H.M. Signal School, Portsmouth, as Research Physicist. Sometime Research Electrical Engineer, now Chief Engineer, to the Dubilier Condenser (1921) Co., Ltd. Author of papers on Radiotelegraphy and Telephony, read before a number of Societies, and of "Telephony without Wires." Address: 138, Muswell Hill Road, London, N.10.

Craioveanu, Eugen.—B. 1872. Secondary studies and graduated in Physics and Chemical Science in Roumania. Sent by Roumanian Post Office Department to study as Telegraph Engineer at Ecole Supérieure des Postes et Télégraphes, Paris, and Post und Telegraphen Hochschule, Berlin. Engineer in all branches of Telegraphy and Telephony, Roumanian Post Office. District Director, Chief of Telegraph Postal Service during Balkan War (1913), and also 1916 to 1917. Sub-Director-General of Roumanian Posts, Telegraphs and Telephones, January, 1920. Resigned August 1st, 1920. Engaged in research for modernising technical

telegraphy and telephony. Director-General of Roumanian "Radioromăna" Company, formed by the fusion of the Roumanian "Marconi" and "Radioelectrică" Companies. Address: 4, Strada Saguna, Bucarest-Roumania.

Craven, Tunis A. M.—B. 1893. Graduate U.S. Naval Academy Class of 1913. Radio Officer U.S.S. "Delaware" 1913-1915. Fleet Radio Officer U.S. Asiatic Fleet 1915-1917. In charge U.S. Naval Coastal and Transoceanic Radio Operations, 1917-1920. U.S. Naval Representative at Provisional Inter-Allied Communication Conference at Paris, France, in 1919. Naval Representative on U.S. Government Inter-Departmental Board to arrange for collection and distribution of meteorological data in 1919. U.S. Naval Radio Technical advisor at International Conference on electrical communication at Washington, 1920; was also chairman of sub-committee on wavelength allocation at this Conference. Battleship Force Radio Officer 1921. U.S. Naval Representative at Conference of Committee on International Radio Communication at Paris, France, in 1921. Fleet Radio Officer U.S. Atlantic Fleet, 1921-1922. Lieutenant U.S. Navy (Radio Traffic Engineer).

Crawley, Lieut.-Col. C. G. G., R.M.A. (Ret.).—B. 1880. Educated Dublin University and R.N. College, Greenwich. Employed at Wireless Telegraphy in the Navy, 1903 to 1913, as Experimental, Instructional, and Fleet Wireless Officer. Deputy Inspector of Wireless Telegraphy in the Post Office, 1913. Returned to the Naval Wireless service for the period of the war. Served in the Grand Fleet, in command of the R.N.V.R. Wireless School, at the Admiralty, and supervised the erection and working of various Naval stations abroad. Officer of the Order of Aviz. Order of Liakat. R.H.S. testimonial for-saving life. Resumed his duties in 1919. Sec. to the Wireless Telegraphy Commission for planning stations for the Imperial Chain. Deputy Inspector of Wireless Telegraphy, General Post Office. Address: General Post Office, London, E.C.

Cresswell, F. G.—Entered upon professional career, 1897, and received his training and experience with engineering firms in Australia. Entered Government service in the Electrical Engineers' Branch of the Postmaster-General's Department, Melbourne. Commissioned in the Naval Forces of the Commonwealth as Engineer Sub-Lieutenant detailed for electrical duties, 1907. Served in the Royal Australian Navy from the time of its inauguration. Appointed Fleet Wireless Telegraph Officer, 1912, rising to the rank of Radio Commander and Acting Director of the Radio Service, July, 1916. Selected to take over the control, under the Naval Board, of the Wireless Telegraphy Department of the Commonwealth, which had been transferred by Act of Parliament to the control of the Royal Australian Navy. Assisted at the capture of the German high-power wireless stations at Samoa, Nauva, and Rabaul, being mentioned in despatches. Member of the Institute of Engineers, Australia. Appointed Electrical Lieut.-Commander Royal Australian Navy since the transfer of the Commonwealth Radio Service back to the Postmaster-General's Department and the disbandment of the Royal Australian Naval Radio Service. Director of Signal Division Naval Staff. Address: Navy Office, Melbourne.

Cross, Professor Charles R.—B. at Troy, New York, March 29th, 1848. Returned with his father to Newbury Port, Massachusetts, 1862. Graduated at the Putnam Free School in that

city, 1865, and engaged temporarily in teaching. Graduated at Massachusetts Institute of Technology, 1870. Appointed instructor in Physics. Became a Junior Professor in Physics, 1875. Placed in charge of the Dept. of Physics, 1877, and later Thayer Professor of Physics and Director of the Rogen Laboratory of Physics. Became interested in the industrial applications of electricity. Lectured upon this subject, 1881. Retired from active teaching, 1918, and made Professor Emeritus. Author of papers embodying the results of researches upon electric and acoustic subjects. Has delivered many public lectures, a number of which were before the Lowell Institute of Boston. Acted as expert for the American Bell Telephone Company throughout the extended litigation concerning the Bell patents, as well as in other telephone cases. Expert for the American Marconi Company in the suits which resulted in the establishment of its fundamental patents. Fellow of the American Academy of Arts and Sciences. Chairman of the Rumford Committee of that institution for twenty-two years. President of the Elizabeth Thompson Science Fund, a member of the American Association for the Advancement of Science, the British Association for the Advancement of Science, and of the American Institute of Electrical Engineers, of which he was one of the original vice-presidents. Past Chairman of one of the three Lectures of the Electrical Congress at the World's Columbian Exhibition at Chicago, 1893.

De Forest, Dr. Lee.—B. Council Bluffs, Iowa, 1873. Graduated Ph.D. 1899. Founded the De Forest Wireless Telegraph Co. 1902, the Radio Telephone Co., and the De Forest Radio Telephone Co., 1907. In 1904 was working on the use of the flame as a rectifier for high frequency radio currents and took out a patent, from which, in 1907, he evolved the Audion by interposing a grid into the two electrode valve. Awarded Gold Medal for radiotelegraphic work, St. Louis Exhibition 1904. M.I.E.E. (Amer.) Member Franklin Institute M.I.R.E. (Amer.). Address: The De Forest Radio Telephone & Telegraph Co., Central Avenue, Jersey City, N.J.

De Groot, Doctor Engineer Cornelis Johannes.—B. at Den Helder, January 27th, 1883. Educ. as Mechanical Engineer at Technical High School, Delft, and afterwards at Karlsruhe, where he obtained the diploma of Electrical Engineer. During 1915-19 took degree as Doctor in Technical Sciences at Delft University. Spent eighteen months in the service of the G.E.C. of Berlin, and thence transferred himself to the Dutch East Indian Government, superintending the erection of various wireless stations in the Indian Archipelago. In 1915-16 visited Europe on furlough and took Doctor's degree on the thesis of "Radio telegraphy in the Tropics." Chief of the Radiotelegraphic Service in the Dutch East Indies. Has made many contributions to radio literature, one of the best known being a monograph on "The Nature and Elimination of Strays," originally read before the Institute of Radio Engineers, New York.

Dellinger, J. H.—Born Cleveland, Ohio, 1866. Educ. East High School, Cleveland, Ohio; graduated 1903 Western Reserve University, Cleveland, Ohio; student 1903-07; Phi Beta Kappa, 1906; instructor in physics, 1906-07. George Washington University, Washington, D.C.; A.B. 1908. Princeton University; Fellow, 1912-13. Ph.D., 1913. Bureau of Standards, Board of Graduate In-

struction; instructor in electricity and radio, 1918-19. Physicist in Bureau of Standards, 1907 to date. Research on: electrical properties of copper (becoming the basis of international standard); miscellaneous mathematical and electrical subjects; electric units; science and development of radio communication. Chief of Radio Laboratory, Bureau of Standards. Author of three books on radio communication and numerous articles and treatises in above fields published by Government and in various electrical and physical periodicals. Delegate of Department of Commerce at 1921 Conference in Paris of Inter-Allied Technical Committee on Radio Communication. Member of Technical Staff of Conference on Limitation of Armament and Far Eastern Problems, Washington, 1921-22. Secretary of U.S. Government Inter-department Radio Committee, 1922. American Physical Society; Washington Academy of Sciences; The Federal Club; American Radio Relay League, Technical Advisory Committee; American Radio Association, Advisory Committee; American Geophysical Union, Section of Terrestrial Magnetism and Electricity; International Union of Scientific Radio Telegraphy, Technical Secretary of American Section.

Dennergy, Alfred.—B. Marckolsheim (Bas-Rhin) 1871. Former pupil of l'Ecole Polytechnique. Inspector General of Posts and Telegraphs. Director of l'Ecole Supérieure des Postes et Télégraphes. President of Technical Committee of Posts and Telegraphs, wireless telegraphy section. In summer 1904, Delegate of the French International Congress of Electricians at St. Louis (U.S.A.). Director of the Office of the Ministry of Posts and Telegraphs 1906 to 1909. Founded le Laboratoire de Recherches de l'Administration des Télégraphes et Téléphones. President of the Commission des Annales des Postes, Télégraphes et Téléphones. Decorated with the Distinguished Service Medal (U.S.A.) for services rendered to the American Expeditionary Corps during the Great War. Member of Conseil de Perfectionnement de l'Ecole Polytechnique. Commander of the Legion of Honour. Address: Ecole Supérieure des Postes et Télégraphes, 20, Rue Las Cases, Paris.

Desbarats, George Joseph, C.M.G., B.Sc.—B. Quebec, January 27th, 1861. Educ. Public Schools; Terrebonne College, Ecole Polytechnique, Montreal (honours and gold medal, 1879); Laval University (B.A.Sc., 1901). Engineer on construction of canals and other public works; assistant to late John Page, Chief Engineer of Canals; Inspector, Railway Construction, B.C., 1892-96; Engineer of Construction, Galops Canal, 1896-99; employed in hydraulic survey work; St. Lawrence River, three years; rebuilt and enlarged the Government shipyard, Sorel, Quebec, 1901; Acting Deputy Minister of Marine and Fisheries, Ottawa, 1908-09; Deputy Minister, 1909-10; Plenipotentiary for Canada at the Radiotelegraph Conference held at London, England, 1912. Member of the Canadian Society Civil Engineers, 1897; Councillor, 1907; Vice-President, 1909; Councillor, Ecole Polytechnique, 1909; Plenipotentiary for Canada to International Seaman's Conference, Genoa, 1920. Deputy Minister and Comptroller of the Canadian Naval Service since June, 1910. Address: Ottawa, Canada.

Destruge, Guillermo, Director-General of Telegraphs, Telephones and Wireless, Ecuador, February, 1898, to February, 1906, and from

March, 1912, in which capacity he is still serving. Established duplex telegraphic system and telephones in Quito, the capital, 1900. President of the Radiotelegraphic Commission of the Republic. The personnel of the Telegraphic and Telephonic service of Ecuador presented to him on August 10th, 1920 as an appreciation of his good work, an artistic and valuable inscribed gold tablet. Author of several scientific publications. Address: Apartado No. 59, Quito, Ecuador, South America.

De Valbreuze, R.—B. 4877. Engineer-electrician (Ecole Supérieure d'Electricité Paris, 1903).—Presented (1902) a memorandum to the French Ministry of War on the subject of undamped waves. Attached as Officer of Engineers to the Central Establishment of Military Telegraph Materiel. Left Army for industry. Published (1906) a work on wireless telegraphy. During the war was a Captain of Engineers attached to the Radiotelegraphic Centre in Paris. Sometime Vice-President of the Société Internationale des Electriciens. Now Vice-President of the Société des Amis de la T.S.F., M.I.R.E., Member several French Technical Societies. Chevalier of the Legion of Honour. Address: 72, rue Bossière, Paris (xv).

De Vasconcellos e Sa, Dr. Alexandre.—B. November 28th, 1872. Graduated as a Doctor of Medicine in the Medical School at Lisbon. Joined the Portuguese Navy, 1894, where he gained a reputation as a physician and surgeon. After the proclamation of the Portuguese Republic in 1910 interested himself in politics, and as a member of Parliament specialised in Colonial subjects. Served in the Barú Campaign, 1912. Chief Health Officer to the expedition sent to Cuamato when the Germans invaded Portuguese territory, 1913-15. His services won him the highest military distinction granted by the Portuguese Navy. On returning from the expedition to Angola was appointed Commissioner of the Portuguese Government to the Mozambique Company. Secretary of State to the Colonies, May 14th, 1918. In this capacity devoted considerable attention to the development of radiotelegraphy in the Portuguese colonies.

Dowsett, H. M.—B. London, 1879. Educated at the Central Foundation School, London; Ecole Internationale, Paris. Trained as an electrical engineer at Finsbury Technical College under Professors S. P. Thompson and John Perry. His early practical experience was obtained with the British Thomson-Houston Co., Bankside, at the St. Pancras Electricity Supply Station, King's Road, and with S. Z. de Ferranti, Ltd., Charterhouse Square. In April, 1899, he joined the engineering staff of the Wireless Telegraph & Signal Co., now known as Marconi's Wireless Telegraph Co., Ltd. He was associated with much of the early developmental work of this company, and after having erected stations and demonstrated wireless telegraphy ashore and afloat for commercial and war purposes in many parts of the world, was appointed in charge of the test rooms and drawing office at the Hall Street Works, Chelmsford, in August, 1908. In 1912 he was responsible for the layout and equipment of the testing laboratories of the New Street works, which was opened in June of that year, and has held the position of chief of the testing department from that date to the present time. He revised the "Handbook for Wireless Telegraphists," of J. C. Hawkhead, for the second edition published in 1915, and is

the author of "Wireless Telegraphy and Telephony: First Principles, Present Practice and Testing," published in 1920. Contributed to the *Radio Review* and "The Year Book of Wireless Telegraphy and Telephony," Address: Marconi Works, Chelmsford, Essex.

Dubilier, William.—B. July 25th, 1888, in the U.S.A. Educ. Cooper Technical Institute, New York City. President and Technical Director of the Dubilier Condenser and Radio Corporation, New York City. Technical Director of the Dubilier Condenser Co., Ltd., London. Owner of condenser patents, licenses of the Canadian General Electric Co., Ltd., Toronto, Dubilier Condenser and Radio Corporation, New York City, Dubilier Condenser Co., Ltd., London, The Telefunken Company, Berlin, etc. M.I.R.E. (Amer.), Radio Club of America, Progress Club of New York. Inventor of the Ducon mica condenser. Owner of over 200 radio patents, and applications for radio equipment. Address: Bronxville, New York.

Eccles, W. H., D.Sc., A.R.C.S., F.R.S.—B. Furness, Lancs., 1875. Entered the Royal College of Science, South Kensington, in 1894. Three years later was appointed demonstrator in the Physics Laboratory at the College, and in 1898 graduated at the London University with first-class honours in Physics. In 1899 he entered Mr. Marconi's laboratory at Chelmsford and spent a great part of his time in the investigation of electrical oscillations of air wires and in "jiggers." Devised a laboratory method for testing and classifying coherers, and results of a later study of coherers were presented as one of his D.Sc. theses. In 1901 was appointed Head of the department of mathematics and physics at the South-Western Polytechnic, Chelsea, and afterwards University Reader in Graphics at University College, London. Vice-President of the Institution of Electrical Engineers, of the Physical Society, and of the Institute of Physics; First Chairman of the Wireless Section of the Institution of Electrical Engineers; Honorary Secretary of the British Association Committee for Radiotelegraphic Investigation. Since 1916, Professor of Electrical Engineering at Finsbury Technical College, and now Dean of the College. Address: 2, Ryder Street, St. James's, S.W.1.

Echevarri, Capt. J. A. V.—B. 1897. Educated King's College School. Gazetted Sub-Lieut. R.N.V.R. January, 1916. Subsequently became Capt. R.A.F. 1918. Appointed Assistant to Head of Wireless Telegraphy Board 1920. British Delegate at International Conference on Electrical Communications, Washington, D.C., 1920, also at International Technical Committee on Radio Communications, Paris, 1921. Department of Controller of Communications, Air Ministry. Address: Junior Constitutional Club, W. 1., and 22, Crescent Road, Wimbledon, S.W. 20.

Eichorn, Gustav, Ph.D.—B. Düsseldorf (Germany), December 1st, 1867. Studied physics. After the sudden death of his father became managing director of the paternal paper-mills for ten years. Returned to the profession of his choice and continued his interrupted studies. After three years at Berlin, Munich, and Zurich, took the degree (Phil. Dr.) at the last-named University. Entered the wireless telegraph laboratory of Prof. Braun and Siemens and Halske, in Berlin. Appointed manager of their experimental stations on the Baltic, where for about eighteen months he conducted a number of investigations. Publications: *Drahtlose*

Telegraphie (Leipzig, 1904), *Wireless Telegraphy* (London, 1906), *Drahtloser Überseeverkehr* (Zürich, 1921). Collaborator of various technical journals. Returned to Zurich as the representative of the Telefunken Co., 1905, and launched the *Jahrbuch der drahtlosen Telegraphie und Telephonie*, 1907. Engaged in practical and theoretical work in wireless telegraphy and telephony. Address: Hauptpostfach 6123, Zurich, Switzerland.

Eisenstein (Aisenstein), S. M.—B. Kief, Russia, 1884. Educ. Kief University. Studied at the University of Berlin and the Charlottenburg Polytechnic. First turned his attention to wireless telegraphy in 1900. Obtained his preliminary wireless patent and established a private experimental laboratory in 1904. His work received the attention of the Military Authorities, who assisted him to conduct experiments on a large scale and erect certain experimental stations. The action, taken in consequence by the War Office, resulted in the realisation of the necessity for forming a wireless company. The new departure speedily justified itself, and in 1911 the original company coalesced with the Marconi Company and the reconstructed Russian Organisation, with Mr. Eisenstein as Director and Principal Technical Adviser, assumed responsibility for the development of Russian wireless. During the war, he was responsible for the erection of all high-power wireless stations in Russia and for communications with the Allies. In connection with his war services he was appointed Councilor of State of the Russian Empire in 1915 and Officer of the Legion of Honour in 1916. He is also Professor at the Moscow Higher Technical College, member and Vice-President of the Russian Society of Radio Engineers, member of the Russian Technical Society, and member of the Physico-Chemical Society. He is the author of a large number of scientific papers, read before various technical societies and Congresses.

Elwell, Cyril Frank—B. 1884. Son of Thomas Dudley Elwell; married 1909 to Ethel Pullan. Educated Port St. Model Public School, Sydney, Australia; Stanford University, California (B.A. and E.E.). Career: Chief Engineer Wireless Development Co., 1908; Federal Telegraph Co., 1909 to 1913, and Universal Radio Syndicate, London, 1913 to 1915. Managing Director of C. F. Elwell, Ltd., since 1915. Knight of Cross of the Crown of Italy, B.A., M.I.E.E., M. Am. I.E.E., M. Italian I.E.E., F.I., Radio E. Clubs: Royal Automobile and Engineers, London. Address: 12 Craven House, Kingsway, London.

Erskine-Murray, James, D.Sc., F.R.S.E.—B. Edinburgh, October 24th, 1868. After six years' study and research under the late Lord Kelvin at Glasgow University entered Trinity College, Cambridge, as a research student. Assistant Professor of Physics and Electrical Engineering in the Heriot-Watt College, Edinburgh, 1896-98. Appointed experimental assistant to Mr. Marconi, 1898. Lecturer and Demonstrator in Physics and Electrical Engineering at University College, Nottingham, 1900. Lecturer in Electrical Engineering at the George Coates Technical College, Paisley, 1905. Consulting work in radiotelegraphy, 1905. Lecturer on Radio-telegraphy at the Northampton Institute, London, 1907-11. Contributed papers

to numerous learned societies. Author of several works on wireless telegraphy. Partner in the firm of Clark, Forde, Taylor, and Erskine-Murray, consulting engineers, 1913-18. Joined the Royal Naval Volunteer Reserve, 1917, with rank of Lieut.-Commander. Served with the Royal Air Force in charge of the design of wireless instruments and of experimental work till May, 1922. Past President of Wireless Society of London. Now Experimental Engineer at H.M. Signal School, R.N. Barracks, Portsmouth. Club, Caledonian.

Ewen, Harry Alexander.—B. Aberdeen, 1877. Educ. Aberdeen Grammar School; Liverpool Institute. Received Engineering training at Heriot-Watt College. Medallist in Elec. Eng. and Elec. Eng. Hons., 1901-02. Joined Engineering Staff of Marconi's W/T Co., 1902. Appointed Wireless Telegraph Expert to the Brazilian Navy, 1910; rejoined Marconi's W/T Co. as Chief of Drawing and Design Dept.; appointed Chief of Installation Design Division, 1922. Address: "Braeside," Priest Lane, Shenfield, Essex.

Faber, R. N. A., Lieutenant-Colonel, Royal Danish Engineers.—Born in Copenhagen, April 29th, 1869. Chief of Military Wireless Service of Denmark. Delegate to the International Radiotelegraphic Congress of Berlin, 1906, and London, 1912. Member of the Military Telegraph and Telephone Commission and of the Government Radiotelegraph Commission. Knight of the Order of Dannebrog, etc. Permanent address: Ingeniørkasernen, Copenhagen.

Farrand, C. L.—B. Newark, N.J., October 22nd, 1891. Educ. Central High School, Philadelphia, Pa. Wireless operator and instructor, 1909-13. Inspector of construction work, 1913, testing and designing of coastal stations. Assistant to Mr. H. Shoemaker, the research engineer of the Marconi Laboratory, Aldene, N.J. Engineer-designer to Aldene, N.J., 1917, especially devoting his attention to radiotelegraphic research and design.

Ferrie, General Gustave.—B. at St. Michel de Maurienne (Savoy), 1863. His connection with wireless telegraphy started February, 1899, when he was present during experiments of Senator Marconi between Wimereux and Dover. Initiated French Military Radiotelegraphic Service in 1900. Was member of French Delegation to the International Electrical Congress of St. Louis in 1904. Member of the French Delegation to the International Radiotelegraphic Conference of London (1912). Appointed General Secretary of the International Time Conference, Paris (1913). Member of the Inter-Allied Wireless Technical Committee in Washington (1920). President of the Inter-Allied Technical Committee in Paris (1921). President L'Union Radiotélégraphique Scientifique Internationale. President of the International Commission on Longitudes. Technical Director of French Military Radiotelegraphy. Member of the Academy of Science (Paris), D.Sc. (Oxford), Commander of the Legion of Honour, Companion of St. Michael and St. George, Grand Officer of the Eastern Sun (Japan), Commander of the Crown of Italy, Grand Officer of the Star of Roumania, Officer of the White Eagle of Serbia, Holder of the Distinguished Service Medal (U.S.A.), Commander of the Sword of Sweden, Commander of the Double Dragon of China, etc., etc. Author of the first work on wireless in France and a

large number of monographs and periodic contributions dealing with radiotelegraphy and kindred subjects, both from a technical and organisation point of view. Address: Inspecteur Générale de la Télégraphie Militaire, 51 bis, Bd Latour-Maubourg, Paris, 7e.

Fessenden, Reginald Aubrey.—B. Milton Canada, October 6th, 1866. Educ. New York and Port Hope, Ontario. Inspecting engineer to the Edison Company, New York. Took up teaching work and conducted classes in physics and electrical engineering at Western University, 1892. Professor of Electrical Engineering at Western University, Philadelphia, 1893. Special Agent to the U.S. Weather Bureau, 1900. Has devoted much attention to the development of a system of wireless telegraphy known by his name, and has also carried out important experiments in wireless telephony. Contributor of articles on wireless telegraphy and telephony to many technical journals.

Field, Rear-Admiral F. L., C.B., C.M.G.—B. April 19th, 1871. Entered Royal Navy, July, 1884; promoted Lieut., 1893; qualified as Torpedo Lieut., 1896. Landed in expedition for Relief of Legations at Pekin from H.M.S. "Bardie," 1900. Mentioned in despatches; wounded at taking of Tientsin Native City. Promoted Commander, 1902; Captain, 1907; Commanded H.M.S. "Duncan," 1910; Superintendent of Signal Schools, 1912; Capt. H.M.S. "Vernon" (Torpedo School), 1914; Capt. H.M.S. "King George V" at Battle of Jutland; mentioned in despatches, awarded C.B. (Military division). Chief of Staff to Admiral Second-in-Command Grand Fleet, 1916. Awarded C.M.G. for this service. Director of Torpedoes and Mining at Admiralty, 1918. Promoted Rear-Admiral, February 11th, 1919. Third Sea Lord and Controller of the Navy; Member of Committee (appointed November, 1919) to advise British Government on Imperial W/T Communications. Addresses: Admiralty, Whitehall, London, S.W.1, and United Services Club, Pall Mall.

Fisk, Ernest Thomas.—B. Sunbury-on-Thames, August 8th, 1886. Educ. Primary and High Schools. Studied physics, mathematics, and commercial subjects. After two years with Messrs. Frederick Walton and Co., he entered the British Telegraph Service. Joined the Marconi Company in England (1905). Temporarily engaged in engineering branch of the American Marconi Company, erecting stations on ship and shore. Undertook a special mission to the Arctic icefields, 1909, and demonstrated the possibilities of wireless communication with Newfoundland Sealing Fleet. Visited the Antipodes, 1910, in R.M.S. "Otranto," and demonstrated the use of the Marconi apparatus for the Orient Mail Line of steamers. Again visited Australia, 1911. General Manager with a seat on the board of directors of Amalgamated Wireless (Australasia), Limited, 1913. Revisited England, 1916. Shortly after return to Australia, accepted position as Managing Director of the Company. Tested possibility of direct wireless communication between England and Australia. Gave the first public demonstration of wireless telephony in Australia before the Royal Society of New South Wales. Managing Director of the Australactic Company, now Australactic, Limited. Founder and initiator of "Sea, Land, and Air," the first journal in the Southern Hemisphere to deal with aviation and wireless. Established the Australasian branch of The Wireless Press.

Member of the Electrical Association of Australia, President of the Wireless Institute of Australia (New South Wales Section), Member of the Sydney Chamber of Commerce and the Chamber of Manufacturers, Member of the Executive Committee, Australasian Industries Protection League, Member Provisional Committee appointed to consider the formation of the Chamber of Science and extending application of science to industry. Chairman Section of Industry, Royal Society of N.S.W., 1920-21. Contributed Paper entitled "The Thermionic Valve in Wireless Communication." Addresses: "Wireless House," Clarence Street, Sydney, N.S.W., "Wireless House," Chancery Lane, Melbourne, Vic., "Australia House," Strand, London, W.C.2.

Fleming, John Ambrose, D.Sc., M.A., F.R.S.—B. Lancaster, November 29th, 1849. Educ. University College School, London; University College; R. School of Mines. Sometime Fellow of St. John's College, Cambridge; Fellow and Hughes Gold Medallist, Royal Society. Lecturer in Mechanics and applied science, Cambridge University (1880). First Professor of Mathematics and Physics (1881), University College, Nottingham. First occupant of Pender Chair of Electrical Engineering, University College, London (1885); Vice-President of Radio Society of Great Britain. Sometime Vice-President of Institution of Electrical Engineers and Physical Society. Honorary Member of the Royal Engineers' Institute, Chatham. Scientific Adviser to the Edison and Swan United Electric Light Company, 1882-93. Scientific Adviser to the London Electric Supply Corporation, and many other corporations, firms and companies in electrical matters. Publications: Numerous contributions to scientific literature and research. Author of well-known text-books, particularly on wireless telegraphy. Twice awarded Institution Premium of Institution of Electrical Engineers; also twice awarded the silver medal of Royal Society of Arts, and Bernay's Premium of the Society of Engineers. Awarded the Gold Albert Medal of the Royal Society of Arts in 1921 for his electrical researches and inventions. Widely known as the inventor of the Thermionic Valve or Fleming Valve. University Professor of Electrical Engineering, University of London (1912). Address: The Pender Electrical Laboratory, University College, Gower Street, London, W.C.1.

Forberg, Olaf E.—B. November 22nd, 1871, in the Province of Finnmark, Norway. Early attached to the Norwegian Telegraphic Service, first as a Telegraphic Clerk, later as the head of a station; Manager of the Controlling Station Veblungnes, in the Romsdal, 1900. Erected several new telegraphic plants in Norway, 1893-1904. Went to Iceland on an inspection, 1905, and in 1906 he constructed the telegraphic line from Reykjavik to Seydisfjord. Superintended the erection of stations and organisation of the telegraphic system in Iceland. Director of Telegraphs in Iceland, 1907, and controls both the wired and wireless nexus of the island. Member of the Engineers' Association of Iceland. Knight of Dannebrog, 1907. Address: Director of Telegraphs, Reykjavik, Iceland.

Fortescue, Cecil L.—B. January 15th, 1881. Educ. Oundle School and Christ's College, Cambridge, First-class Honours, Mechanical Sciences Tripos, 1903. Engineering training with Messrs. Siemens Dynamo Co., Stafford, 1903-06. Civilian Instructor in Applied Mechanics and Electro-Technics at H.M. Gunnery and Torpedo Schools,

Portsmouth, October, 1906. During the war attached to Wireless Telegraphy Department, H.M.S. "Vernon," and at H.M. Signal School, Portsmouth. Professor of Phys.cs, Royal Naval College, Greenwich, since January, 1911. M.I.E.E., serving on Committee of Wireless Section of that Institution. Fellow of the Institute of Physics. Member of the Physical Society of London, serving on the Council. Member of Sub-Committee "D" on Thermionic Valve of Radio Research Board, of the Department of Scientific and Industrial Research. Address: Royal Naval College, Greenwich, S.E.10.

Franklin, Charles Samuel.—B. 1879. Received engineering and scientific training at Finsbury Technical College, under Professor Sylvanus Thompson. After some time spent in electrical work, first at Manchester and afterwards with the Norwich Electricity Company, joined Marconi's Wireless Telegraph Company (then known as the "Wireless Telegraph and Signal Company"), 1899, and still remains in their service. He has during recent years been engaged in conducting experimental and research work on behalf of Senatore Marconi, and has a number of important patents to his credit.

Frey, Emile.—B. 1838, Arlesheim, near Basel. Visited University of Tena, 1855-60. Visited United States and took part in American Civil War (1861-1865), serving with the Northern (or federal) army. Was made prisoner in the Battle of Gellisburg, July 1863. Designated by lot as hostage with two other prisoners for Captain Gordon and two other confederate officers. Condemned to death at Washington, May 3rd, 1864. Saved from the gallows by the action of President Lincoln, taking as hostage for Captain Frey, the confederate Captain Steward and two others. Breveted Major by President of the U. S. Johnson "for gallant and meritorious services during the war." Returned to Switzerland, 1865. Member and President of the Government of Basel-Compagne, 1866-1872. Editor of the "Basler Nachrichten," 1872-1882. Member of the National Council, 1872-1882, of which he was chairman from 1875-1876. Swiss Minister Plenipotentiary at Washington, 1882-88. Member of the Federal Council, 1890. Vice-President, 1893. President of Swiss Confederation, 1894. Resigned from the Federal Council, 1897. Director of the International Bureau of the Telegraph Union from 1899, and of the Radio-Telegraphic Union from 1910 until 1921. Was President of the Diplomatic Conference for the Protection of Labourers at Berne, 1907. Created Doctor Philosophical, *honoris causa*, by the University of Berne, 1912. Author of the military history of Switzerland, and of a number of other publications. Address: Arlesheim, near Basel.

Frouin, M.—Director of French Telegraphs, one of his country's representatives at the International Radiotelegraphic Conference, London, 1912.

Gardiner, B. C.—B. February 25th, 1879. Son of Rev. Canon W. Gardiner, B.D., of St. Albans Priory, Wallingford. Educ. at Marlborough College. Joined Royal Marines 1897. Supervised the erection of Bermuda Wireless Station 1907. Senior Instructor of Wireless Telegraphy at the Royal Naval Electrical School, H.M.S. "Vernon," 1910. Attached R.E. as the Instructor of Wireless Telegraphy at the Army School of Military Engineering, Chatham, 1913. Wireless officer on the staff of Lord Jellicoe 1914-1916. Fleet wireless officer on the staff of Earl Beatty 1916-1918. Awarded Brevet Lieut.

Col. and C.B. Head of the Wireless Telegraphy Board 1920. Admiralty representative at the Allied Conference on Electrical Communications at Washington 1920 and at Paris 1921. M.I.E.E. Address: St. Albans Priory Wallingford, and United Service Club.

Gentil, Captain Antonio Alves Soares Branco.—B. March 7th, 1874. Educ. at the Polytechnic and Naval Schools. Between 1893 and 1909 filled various Naval posts in Angola and Mozambique. Qualified as Torpedo Operating Officer at the Torpedoes and Electricity School of Val de Zebro in 1909; appointed Instructor of Wireless Telegraphy at the same school in 1911. Qualified as Submarine Commander in 1915. In 1916 became member of the Technical Committee of Naval Wireless Telegraphy appointed to investigate and make recommendations concerning wireless in all Portuguese Colonies. Appointed to the Naval Staff, August, 1918. Member of Technical Committee of Portuguese Naval Wireless Telegraphy. Address: Majoria General d'Armada-Estado Major Naval, Lisbon.

Girardeau, Emile.—B. 1882. Educ. Ecole Polytechnique. Joined the Army and served as an officer in the Engineers. Managing Director Cie, Générale de Télégraphie Sans Fil, Cie Radio-France, Société Française Radio-Electrique. Director of Radio-Maritime, Sté Anonyme Internationale de T.S.F. (S.A.I.T.), Sté Radiotechnique, Sté Radio Romana, etc.etc. Author of various works on a number of subjects relating to wireless telegraphy. Founder of the Société Française Radio-Electrique. Member of the High Committee appointed by the French Government for Wireless. Member of Légion d'Honneur. Address: 79, Boulevard Haussmann, Paris (8e).

Glazebrook, Sir Richard Tetley, Kt., K.C.B., M.A., D.Sc., F.R.S.—B. Liverpool, 1854. Educ. Trinity College, Cambridge. Fifth Wrangler. Studied Physics as Graduate at the Cavendish Laboratory, Cambridge, under Clerk Maxwell and Lord Rayleigh. Fellow of Trinity College, Cambridge (1877). Principal of University College, Liverpool (1898-99). First Director of the National Physical Laboratory (1899-1919). Chairman of the Aeronautical Research Committee. Zaharoff Professor of Aviation and Director of the School of Aeronautics, Imperial College. Past President of the Institute of Electrical Engineers. Medal of the Royal Society of Arts (1918). Member of Technical Committee inquiring into Imperial Wireless scheme. Publications: Numerous works on Physical Optics, Laws and Properties of Matter, text-books on Heat, Light, Mechanics and Electricity, as well as numerous papers in Scientific and Technical Journals. Address: 5, Stanley Crescent, Notting Hill, W.

Gold, Lieut.-Col. E. D.S.O., F.R.S.—B. Berks-well, Warwickshire, July, 1881. Educ. King Henry VIII's Grammar School, Coleshill; Sir Josiah Mason's College, Birmingham; St. John's College, Cambridge. (Third Wrangler, 1903.) Part II Natural Science Tripos, 1904. Lecturer in Mathematics, City of London College, Moorfields, 1904; Fellow St. John's College, Cambridge, 1906; Superintendent, Instruments Division, Meteorological Office, 1906; First Schuster Reader in Dynamical Meteorology (1907); Superintendent of Statistics, Meteorological Office (1910). Gazetted Capt., June, 1915, and attached G.H.Q. as Meteorologist to R.F.C. D.S.O. for services in Battle of Loos, and promoted Major. Appointed to command of new Meteorological Section, R.E. Mentioned in dispatches five times; promoted Lieut.-Col.,

March, 1918. Represented British meteorology in Aeronautical Convention at Peace Conference 1919. Research: Identification of negative "ions" in flames with "electrons" (1905); relation between barometric pressure and wind velocity (1906); atmospheric radiation (1907), Publications: Report on existing state of knowledge of upper atmosphere (read British Association, 1909); "International Kite and Balloon Ascents" (1911). Assistant Director of Meteorological Office; President International Commission for Weather Telegraphy. Address: 8, Hurst Close, Bigwood Road, London, N.W.11. Tel. Finchley 1209.

Goldschmidt, Professor Dr. Rudolf.—B. March 19th, 1876, at Neu-Bukow, Mecklenburg, Germany. Educ. Wismar Municipal School. Studied engineering at Charlottenburg and Darmstadt Technical High School. Engineer in the laboratory of the A.E.G. in Berlin, 1900. Chief laboratory engineer and designer in Prague, 1901-02. Chief engineer and designer at Cromptons & Co., Ltd., Chelmsford, 1902-05; similar position with Brit. Westinghouse El. and Man. Co., Manchester, 1905-07. Lecturer at Darmstadt Technical College, 1907. Here he practised as a consulting engineer, and also pursued the development of several inventions, chiefly occupying himself with the invention and design of high-frequency alternators for wireless telegraphy. Established (1911) two large wireless stations at Elbsee, Province of Hanover, and Tuckerton, New Jersey, U.S.A., for wireless communication between Germany and America. Address: Berlin-Westend, 45, Lindenallee, Berlin.

Goldsmith, Prof. Alfred N., B.Sc., Ph.D.—B. New York City, 1887. Educ. B. S. Coll. of the City of New York, 1907; Ph.D. Columbia Univ., 1911; Phi Beta Kappa; m. New York, N. Y., 1914, Elsie H. Borg; one son, Warren Randall. Consulting Radio Expert, U.S. Department of Justice, 1912. Consulting Radio Engineer Atlantic Communication Co., 1914. Consulting Engineer General Electrical Co., 1915-17. Director of Research, Marconi Wireless Telegraph Co. of America, 1917-19. Associate Professor in charge of electrical engineering, College of City of New York, since 1919. Director of Research Department, Radio Corporation of America since 1919. Editor, "Proceedings of the Institute of Radio Engineers," since 1912. Member U.S. Federal Radio Telephone Commission, 1922. Made investigations in simplex and duplex radio telegraphy and telephony, transmission of canal rays, precision measurements in radio engineering. Author, "Radio Telephony" (Wireless Press), 1918, "Radio Measurements," "Radio Frequency Changers" (Proceedings of the Institute of Radio Engineers), 1915, "World Communication" (Journal of the American Institute of Engineers), 1921. Technical Director U.S. Signal Corps School of Communication, 1917-18, U.S. Naval Radio School, 1917-18. Fellow, A.I.E.E., I.R.E., hon. member Radio Club of America, Radio Society of Great Britain, American Physical Society Club, the Static. Addresses: The College of the City of New York, and 450, West End Avenue, New York, N.Y.

Gottwaldt, Commander B. L.—B. Christiania, 1880. Entered Naval Academy, Norwegian Navy, 1898. Graduated sub-lieutenant, 1901. Attended the Military Academy of the Royal Navy, 1901-04, afterwards the Technical College, Charlottenburg, Berlin. At the latter studied electrical engineering, telegraphy,

telephony, and wireless telegraphy. Visited (1906) England on behalf of the Norwegian Admiralty to attend to some special work with Messrs. Armstrong, Whitworth Co., Newcastle-on-Tyne. Returned to Norway and placed in charge of W/T in the Royal Norwegian Navy, where he was responsible for the erection of naval, land and ship stations. Appointed Commander, 1912. Entrusted with the control and test of wireless apparatus ordered in England and Germany by the Norwegian Government. One of the Norwegian delegates at the International Radio Conference in London, 1912, Late Inspector of W/T, Norwegian Nav. Department. Technical Manager, Norwegian Wireless Company (Norsk Marconikompani). He has written a number of articles, and three books on wireless. Address: 15, Baldersgate, Kristiania.

Gray, Andrew, A.G.T.C.—B. Glasgow, 1873. Educ. Glasgow University; Royal Technical College. Diploma of latter in electrical engineering. Served as assistant to late Professor Andrew Jamieson, of Royal Technical College. Joined the West India and Panama Telegraph Company, Ltd. (1893), serving respectively as assistant electrician, chief electrician, and telegraph engineer. Entered Marconi Company, 1899. Introduced Marconi system to Hawaiian Islands. Organised telegraph working and training of native operators of Inter-island Telegraph Company of Honolulu. Appointed Chief of Staff to the Marconi Companies in 1901, and in that capacity organised the working of the ship and shore wireless service, designed the original 1½ kw. Ship Set, and supervised the ship and shore operating until 1906, when the engineering and traffic work were separated. Chief Engineer of the Marconi Parent Company since 1910. Address: 78, Creffield Road, Acton, W.3.

Grenfell, Wing Commander George Pascoe, D.S.O. (1917).—B. 1883. Educ. privately. Successively on staffs of Eastern Telegraph Co., Ltd.; Amalgamated Radio Telegraph Co., Ltd. (De Forest & Poulsen Systems); British Radio Telegraph Co., Ltd. Went overseas 1915 in charge of Wireless in R.F.C., Middle East. Served in Egypt, Senussi campaign, and Salonika. Transferred to H.Q. Staff—R.F.C., B.E.F., France, end of 1916. In charge of W/T (Communications and Artillery Co-operation). Mentioned in dispatches, 1917. Returned to England and joined Staff of Director of Air Organisation, Air Ministry, as S.O. 1, June, 1918. Appointed member of W/T Board, June, 1918. Took command of W/T Experimental Establishment, Biggin Hill, December, 1918. Address: R.A.F., Biggin Hill, Kent.

Guthrie, Frederick Preston.—B. August County, Virginia, 1891. Educ. Chamberlain-Hunt Academy, Port Gibson, Miss. Graduated from Washington Lee University, A.B. Degree, 1911. Vanderbilt Fellow in Astronomy, University of Virginia, 1911-12. Professor of Science, Miami Military Institute, Germantown, Ohio, 1912-13. Assistant Professor of Physics, The Citadel (the Military College of South Carolina) Charleston, S.C., 1913-17. Enlisted in South Carolina Naval Militia, 1915; promoted to Lieutenant, 1916; called to active duty in U.S. Navy, 1917; remaining on active duty until 1919; served at Charleston Navy Yard and in office of Director Naval Communications, Navy Department, Washington, D.C.; author, Communication Regulations, U.S. Navy, 1918. 1919, assigned to duty with United States Shipping Board Emergency Fleet Cor-

poration by order of Secretary of Navy, to organise Radio Service. Later, released from active duty in the Navy and appointed Manager of Radio Department, United States Shipping Board Emergency Fleet Corporation. Member of Committee appointed by Secretary of Commerce to consider EU—F—GB—I Radio Protocol, 1920. Member of American Delegation to meeting of Technical Committee on International Radio Communication, which met in Paris, 1921. Member of Inter-Department Advisory Committee on Government Radio Broadcasting, M.I.R.E. In charge of Radio Service of United States Shipping Board. Address: United States Shipping Board, Washington, D.C.

Gutton, T.—Prof. of the Faculty of Nancy. Delegate to the International Technical Wireless Committee (Paris, 1922). Contributions—On the simultaneous maintenance of oscillating and of harmonic circuits,—“Comptes Rendus de l'Academie des Sciences.” On the transmission and the reproduction of sounds by radiotelephone—“L'Onde Electrique.” On the damping of oscillations in relay amplifiers—“L'Onde Electrique.” On the simultaneous maintenance of several oscillating circuits by the same valve, Annales des Postes, Télégraphes et Téléphones. “The Three Electrode Lamp,” three lectures published by the “Société du Journal de Physique” and “Les Presses Universitaires de France.” 1 vol. 181 pages (which appeared in November, 1922). Address: University of Nancy.

Hammond, John Hays, Jr.—B. San Francisco, Cal., 1888. Educ. B.S., Sheffield Scientific School (Yale), 1910; Sc.D., George Washington University. Inventor of type of torpedo for coast defence, controlled by wireless energy from coast fortifications, which was recommended to Congress for exclusive purchase by U.S. by Board of Ordnance and Fortifications, U.S.A. Invented system of automobile torpedo firing type, in latest battleships of U.S.; also aluminothermic incendiary projectiles employed by Allied armies in the Great War; radio system of control of ships, employed on U.S.S. “Iowa,” for target practice; a system of coastal patrol by aeroplane which has been adopted by most of the coast states; a system of selective radio telegraphy, testing approved by U.S.N., U.S. Signal Corps and U.S.A.; system of aerial coast surveying adopted by the Bartlett expedition for Polar exploration. Has applied for over 224 patents in U.S. and Europe, relating to radio telegraphy and telephony and wirelessly controlled torpedoes. Former member Advisory Board United States Naval Board of Inventors. Member Advisory Committee Langley Aero-dynamic Laboratory of Smithsonian Institution. Co-operation with Third Naval Dist. Member Conference Committee on National Preparedness (Sub-Committee on Finance). Government Aero Club, America (Member Aero-dynamic, Technical, Public Safety and Map and Landing Places Committees). Vice-President, Director, American Society Aeronautic Engineers. U.S. delegate Radiotelegraphic Convention, London, 1912. M.I.R.E. America (ex-Treasurer, etc.). Hon. Member National Institution Inventors, Harvard Aeronautical Society. Fellow, American Geographical Society, Associate Member American Society M.E. Member Royal Society Arts, London. Clubs: Eastern Yacht, Yale, Engineers, University. Home: Gloucester, Mass.

Harbord, James G., Major-General.—B. Bloomington, Ill., 1866. Farmer boy, country

school teacher. Recruit, Company A. 4th Infantry U.S. Army. Commissioned 2nd Lt. 1897. Service in Cuba, Porto Rico and the Philippines covering some sixteen years, during which period he won many distinctions. Appointed Lt.-Col. 1917 and accompanied Gen. Pershing to France as Chief of Staff, serving in this capacity during the period of organisation of the A.E.F. Commanded the Marine Brigade of the Second Division in the Verdun Sector and during the fighting in the Bois de Belleau, Bour-esches and near Château Thierry. Promoted Major-General of the National Army 1918, and commanded the Second Division at Soissons. Returned to U.S. 1919 and promoted Major-General U.S. Army. Deputy Chief of Staff U.S. Army. Elected President Radio Corporation of America January 1st, 1923.

Harrison, Lieut.-Col. Norman, C.M.G., D.S.O. — B. 1873. Educ. in Natal. Served in South African War and European War, 1914-19, as Director of Army Signals in German South-West Africa, and as Assistant Director of Army Signals, and Commanding South African Signal Units (attached to Corps of Royal Engineers) in France, 1916-19. Engineer-in-Chief of Posts and Telegraphs, Union of South Africa since 1919. Addresses: (1) G.P.O., Pretoria; (2) Pretoria Club, Pretoria; (3) Civil Service Club, Capetown.

Hogan, John V. L. — B. Philadelphia, Pa., U.S.A. Educ. Sheffield Scientific School, Yale University, honours in physics and mathematics, with special work in Graduate Physics Laboratories. Assistant to Dr. Lee de Forest, 1906-1907. Research, 1907-09. Joined National Electric Signalling Co. at Brant Rock, Mass., 1909. Telegraph Superintendent, 1910-11. Chief of Operating Inspection and Erection, 1911-14. With International Radio Telegraph Co. (successor of National Electric Signalling Co.), as Chief Research Engineer, 1914-17. Commercial Manager, 1917-18. Manager, 1918, and Executive Supervisor of Design, Research, Manufacture, Sales and Operation until 1922. Now Consulting Engineer, specialising in radio acoustics and patent matters. Fellow, Manager and Past-President, Institute of Radio Engineers. Member, American Institute of Electrical Engineers, American Association for Advancement of Science, Radio Club of America, and other technical societies. Author: "Inductance Coils Used in Wireless Telegraphy," 1909; "The Wireless Telephone," 1910; "Operation of Detectors in Wireless Telegraph Service," 1911 — all in *Electrical World*; "Ein fruhes drahtloses Telephon" (*Jahrbuch der drahtlosen T. und T.*), 1912, etc. Presented addresses before Johns-Hopkins University, Institute of Radio Engineers, American Institute of the City of N.Y., Union League Club, Pan American Scientific Congress, Society of Wireless Telegraphy Engineers, etc. Address: 41, Park Row, New York City, U.S.A. Residence, Forest Hills, Long Island, N.Y.

Holmstroem, J. Gunnar. — B. Stockholm, April 23rd, 1874. Passed through Poly. Acad. Stockholm, 1896. Assistant Royal Swedish Telegraph Dept., 1892. Teacher at Swedish Artillery and Engineers' College, 1904, and College for Naval Officers, 1908. Director of Radiotelegraphic Instruction, Stockholm, Kt. of "Vasa" Order. Publications: "Lärobok in Telegraf," 1914, and "Handbok i Radiotelegrafi," Stockholm, 1908. Address: Malmskillnadsgatan 19 B, Stockholm.

Hooper, Commander Stanford C. — B. August 16th, 1884, Colton, Cal. Educ. at San Bernardino, California. Started his career as telegraph operator in the Southern Pacific Company, afterwards transferring to the Postal Telegraph Company. Entered the Naval Academy, Annapolis, Md., September 6th, 1901. Graduated January 31st, 1905. Served as midshipman on the cruiser "Chicago," destroyer "Perry," and monitor "Wyoming," and later on various ships as ensign, 1907, Lieutenant, 1910, Lieutenant-Commander, 1915, Commander, 1918. Instructor of electrical engineering, physics, and chemistry at the U.S. Naval Academy, 1910-11. Fleet Radio Officer of the United States Atlantic Fleet, 1912-13, taking part in the capture of Vera Cruz, Mexico. Early in the war acted as observer in Europe. In charge of the Radio Division Bureau of Steam Engineering, Navy Department, 1915-17. Commanded the destroyer "Fairfax" in the Atlantic during 1917-18, then returned to take up duties as Chief of Radio material, construction, supply and Development in the Bureau of Engineering attached to the U.S. Navy. Largely responsible for design and construction, U.S. Naval High Power Radio Stations, Annapolis, San Diego, Pearl Harbor, Cavite, Guam, Samoa, and others, also for radio compass system established by U.S. Navy. Address: Navy Dept., Washington, U.S.A.

Hope-Jones, Frank. — B. 1867. From 1890 to 1895 associated with his elder brother, Robert Hope-Jones, in some of his earliest applications of electricity to organ-building. Has established the business of electric time service on a scientific basis. M.I.E.E., the British Horological Institution, and the Worshipful Company of Clockmakers. Author of numerous contributions to technical journals and to the Proceedings of Scientific Societies. Chairman, Radio Society of Great Britain. Address: 32 and 34, Clerkenwell Road, E.C.1.

Howe, Prof. George William Osborn, D.Sc. — B. 1875, Charlton, Kent. Educ. the Roan School, Greenwich, Woolwich Polytechnic, Durham University. Nine years with Siemens Bros., at Woolwich, and Siemens and Halske, at Charlottenburg. Two years lecturer at Hull Technical School. Lecturer and later Assistant Professor of Electrical Engineering at the City and Guilds Engineering College, Imperial College of Science and Technology at South Kensington. Head of the Department of Electric Standards and Electric Measurements at the National Physical Laboratory, 1921. Appointed in the same year to James Watt Chair of Electrical Engineering in the University of Glasgow. D.Sc. of Durham, hon. D.Sc. of Adelaide University. Whitworth Scholar. Has read several papers on Radiotelegraphy before the Royal Society, the British Association, the Physical Society, etc. Awarded the silver medal by the Royal Society of Arts (1912) for his paper on "Some recent Developments in Wireless Telegraphy." Vice-President of the Physical Society. Member of the Radio Research Board. Chairman of the Wireless Section of the Institution of Electrical Engineers. Address: The University, Glasgow.

Hoyle, Lieut. Bertram, M.Sc. — B. Oldham, 1888. Educ. College of Technology, Manchester, and at the Victoria University, Manchester. In 1907 he obtained the Certificate and Diploma in Technology and M.Sc. (Tech.) of Victoria University. Served with Messrs. Henry Simon, Ltd., Manchester, and with Messrs. S. Z. de Ferranti, Ltd., Hollinwood. Assistant Lecturer

and Demonstrator in Electrical Engineering at the College of Technology, Manchester, 1911. Had charge of the design and erection of the wireless station with which the School of Technology is equipped. Enlisted early in 1915 as a motor cycle despatch rider, and served on the Western Front. In September, 1915, gazetted Lieut. R.N.V.R. In 1922 embarked upon private wireless research. Author of "Standard Tables and Equations," and a number of technical essays and monographs. Address: 18, King's Drive, Heaton Moor, near Stockport.

Isaacs, Godfrey C.—Educ. England, France, and Germany. Began life in his father's business and a few years later was manager. Deputy-Chairman and Managing Director of Marconi's Wireless Telegraph Company, Ltd., and Managing Director of the Marconi International Marine Communication Company, Limited. Address: Lyne Grove, Virginia Water, Surrey.

Isbell, Arthur A.—Started in telegraph business in 1893, as a messenger for the Western Union Telegraph Company, at North Adams, Mass., U.S.A. Entered service of original De Forest Wireless Telegraph Company, New York, in 1902. Later associated with Professor R. A. Fessenden for three years in numerous experiments in U.S.A. and Scotland. First merchant marine radio operating in the Pacific Ocean on steamer "President," in 1907. In 1908 built semi-high power station in Hawaiian Islands, and established first wireless communication between the Islands and the mainland of United States. In 1910 erected first wireless station at Wellington, New Zealand. Division Superintendent, United Wireless Telegraph Company, New Orleans and San Francisco. Built Alaskan Circuit for Marconi Wireless Telegraph Company of America. 1917-1918, Expert Radio Aid, Navy Department, Washington, D.C. General Superintendent, Pacific Division, Radio Corporation of America, San Francisco.

Jackson, Admiral of the Fleet Sir Henry Bradwardine, G.C.B., K.C.V.O., D.Sc., LL.D., F.R.S.—B. Barnsley, January 21st, 1855. Entered Royal Navy December, 1868. Capt. 1896; Rear Admiral, 1906; Controller of Navy, 1905-08; Commanded 6th Cruiser Squadron, 1908-10; Chief of Naval War Staff, 1912-14; First Sea Lord, May, 1915-December, 1916; President R.N. College, Greenwich, 1917-19. Hon. Vice-President of Inst. of Naval Architects. Vice-President of Radio Society of Great Britain. Chairman of Radio Research Board, 1920. Hon. D.Sc. Leeds and LL.D. Cantab. Whilst Commander of H.M.S. "Edinburgh," in 1893, conceived the idea of using Hertzian Waves for Naval signalling purposes, especially in connection with torpedo boat work, experimented intermittently in this direction by exciting a circuit which included a filings coherer tapped by the hammer of a high-resistance trembling bell. Continued to take much interest in the development of W/T, and assisted in its organisation in the Navy. Addresses: 37, Catherine Street, London, S.W.1, and The Athenæum Club.

Janet, Paul.—B. 1863, Paris. Studied at the Lycée Louis-le-Grand and the High School. Member of the French Society of Physics, the French Society of Electricians, and the Society of Civil Engineers of France. Professor of Physics at the University of Grenoble, 1886-94. Member de l'Institut. Professor of Physics, University of Paris, Director of the Central Laboratory and of the High School of Electricity. Author of several important works. First to make a successful

experiment in electric resonance by means of high-frequency currents, 1892. Address: Ecole Supérieure d'Electricité, 12 and 14, Rue de Staël, Paris (xve).

Jenner, Axel.—B. 1885. Student 1904. Assistant at the Swedish Telegraph Service 1905. Passed the course for superintendents of the wireless stations 1916. Since 1916 superintendent of the wireless station at Boden, Sweden. Address: Boden, Sweden.

Jotikasatira Hang.—B. at Bangkok, September 27th, 1876. Educ. at Bangkok and at Penang. In 1890 was sent to Europe to be educated as an engineer. Studied seven years at Erfurt, and entered the Technische Hochschule at Hanover in 1897. On passing the final examination of that school in 1902, returned to Siam and joined the Siamese Navy as an Engineer-Lieutenant. 1907-12, an instructor in the Naval Cadet School. Awarded the title of Luang Nava Vichitr, 1911. Joined the Naval General Staff as the Chief of the Wireless Department, 1912. Promoted Commander, 1918. Awarded the title of Phra Vidyayā Dūralikhit, 1920. Captaincy, 1920. Address: Bangkok.

Jouaust, Raymond.—B. 1875. Licentiate of Science—Ingenieur Diplômé de l'Ecole Supérieure d'Electricité de Paris. Director of the Laboratoire Central d'Electricité and Ingenieur a l'Etablissement Central du Materiel de la Radiotélégraphie Militaire. Contributed the first tomes of research on the magnetism of iron and on electrical units. Since 1914 has been principally occupied on questions relative to 3-electrode valves and amplifiers.

Julien, L. (Major of Engineers).—B. Paris 1880. Was a pupil of l'Ecole Polytechnique and l'Ecole Supérieure d'Electricité a Paris. 1913-1914 attached to the wireless station of the Eiffel Tower; 1914-1919 attached to the Radiotelegraphic Service of the armies. At the end of 1919 became Director of all stations under the control of the Ministry of War. Address: Chef du Centre Radiotelegraphique, Ministère de la Guerre, Paris.

Kadōka, Hayao.—B. Tokyo, March, 1883. Graduated from the Tokyo Imperial University, July, 1906. Studied at the Earthquake Investigation Committee in the Dept. of Education, November, 1908. Lecturer at the Science College of the Tokyo Imperial University, March, 1909. Served in the Army, for researches on radiotelegraphy. Proceeded to Europe and America for inspection of the war-time condition of radiotelegraphy, 1917-1918. Since 1911 designed several radio stations. Address: 114, Sanya Yoyogi, Tokyo.

Kajima, Akira.—B. Tokyo, 1883. Graduated from the Greek Catholic Mission School, Tokyo. 1904, and became publisher of a religious magazine. Interpreter at the French Embassy from 1905 to 1906. Received a medal in recognition of distinguished services. Joined the editorial staff of the *Chuo Shimbun* in 1906, and that of the *Kokumin Shimbun* in 1908. Established the Japanese Wireless Press Agency in 1911, and the Nippon Radio Apparatus Manufacturing Company, 1915, which was converted to the Nippon Radio Telegraphy and Telephony Co., Ltd., 1920, and became the Managing Director the same year. Retired 1921. Started a monthly magazine named *Museu no Nippon* or Wireless Press in 1918. Private residence: 46, Kobinata-Daimachi 1-chome, Koishikawa, Tokyo.

Kellaway, Rt. Hon. Frederick George.—B. Bishopston, Bristol, 1870. Second son of the late William Hamley Kellaway, of Kingsdown, Bristol. Educ. Bishopston, Bristol. P.C. 1920. Parliamentary Secretary Ministry of Munitions, 1916. Deputy Minister of Munitions 1918. Secretary to Department of Overseas Trade, 1920, holding the double titles of Additional Under Secretary of State for Foreign Affairs and Additional Parliamentary Secretary to the Board of Trade. Postmaster-General, April, 1921. Member of Parliament, Coalition Liberal, Bedford, from December, 1910 to November, 1922. Joined Board of Marconi Wireless Telegraphy Co., November, 1922. As Postmaster-General secured reduction in postal rates on letters, postcards and printed papers. During his term of office was responsible for the institution of Broadcasting and Wireless Telephony.

Kennedy, Sir A. B. W., F.R.S.—B. London, 1847. Had great mechanical engineering experience. Some time President of the Institution of Civil Engineers, and the Institution of Mechanical Engineers. Professor of Engineering at University College, London, 1874-89, and founded there the first "Engineering Laboratory." Designed electric lighting and power stations for many companies and corporations, and has also been engaged in railway and constructive work. Knighted 1905 for his services to the Admiralty. Member of the Technical Committee appointed by the Postmaster-General to consider the Imperial Wireless Scheme. Civilian Member of the Ordnance Committee. During the War was Member of the Munitions Inventions Panel, and Vice-chairman of the Anti-Aircraft Equipment Committee (Ministry of Munitions). Consulting Electrical Engineer to the L.N.W.R., L.S.W.R., and the London County Council. Chairman of the Electn. of Railways Advisory Committee (Ministry of Transport). Addresses: A7, The Albany, Piccadilly, and Broadway Court, S.W.

Kennelly, A. E.—B. Colaba, Bombay, December 17th, 1861. Educ. in England, Scotland, Belgium, France and Italy. Past-President of the American Institute of Electrical Engineers, Past-President of the American Association of Illuminating Engineers; President, in 1916, of the Institute of Radio Engineers; Vice-President of the International Electrical Congresses, Paris and Turin; General Secretary of the Congress at St. Louis, Mo., U.S.A. Left school in 1875 to become a telegraph operator in the Eastern Telegraph Company. Chief Electrician on Cable Ship, 1881; Senior Electrician ship staff, E.T.C., 1886. Principal electrical assistant to Thomas A. Edison, in the laboratories at Orange, N.J., 1886-92. Consulting Engineer in Philadelphia. In partnership with E. J. Houston, of the Thomson-Houston Company, 1893-1900, Engineer-in-Chief when the cables were laid from Vera Cruz to Campeche, 1902. Professor of Electrical Engineering at Harvard University since 1902 and also at Massachusetts Institute of Technology since 1914. Corresponding Fellow of the British Association for the Advancement of Science; Honorary Member of the Institution of Electrical Engineers of London and has twice received one of its premiums for papers. Honorary Member of the Société Française des Electriciens. Director of Research Division of the Electrical Engineering Department, Massachusetts Institute of Technology, and Fellow of the American Academy of Arts and Sciences. He has written twenty-four books as author or collaborator, one of which is considered a standard elementary exposition of wireless telegraphy, and is author of more than

120 scientific papers. Honorary degrees include the S.D. of University of Pittsburgh, Docteur of the University of Toulouse, and A.M. degree of Harvard University. Some time Chairman and Secretary of Standards Committee, American Institute of Electrical Engineers, President and Secretary of the American Committee of the International Electro-Technical Commission. On duty as exchange Professor in French Universities, 1921-22. Member National Ac. Sciences. A delegate to the Inter-allied Radiotechnical Committee in Paris, 1921. Has specialised in alternating currents. Address: Harvard University, Cambridge, Mass., U.S.A.

Kift, A. A.—B. London, 1881. Educ. City of London School and Finsbury Technical College. Joined Marconi Company, 1902. Acted as erecting engineer supervising the installation of many of the earlier ship stations, including those on board the first vessels of the White Star fleet to be equipped. In charge of the installation of the Post Office Wireless Stations at Lochboisdale, Tobemory and Bolt Head. Chief of the Estimating Department of Marconi's Wireless Telegraph Company, 1911. Chief of the Sales Department, 1921. Address: Marconi House, Strand, W.C.2.

Kimura, Shunkichi, Ph.D.—B. 1866. Graduated Scientific College of the Tokyo Imperial University, in the department of Physics, 1888. Lecturer of the First High School in Tokyo. Studied Mathematical Physics in Harvard and Yale Universities 1893-95. Received the degree of Ph.D. (Yale), 1895. Member of Sigma Xi Society. Visited Holland. Co-founder with Dr. Molenbroek, assisted by Professor Tait, of Edinburgh, and Dr. Joly, of Dublin, of the Association for Promoting the Study of Quaternions and Allied Subjects. Returned to Japan. Professor of the Second High School in Sendai. Transferred to the Imperial Japanese Navy, 1901, to investigate wireless telegraphy for naval use. Invested with Order of Rising Sun (5th Class), 1903. Invested with Order of Rising Sun (3rd Class) with annuity, 1906. Fellow of the Royal Society of Arts, 1906. Japanese delegate to the International Wireless Telegraph Conference, Berlin, 1906. Retired from the Navy, 1912. Patent Attorney, with office at the Mitsui Building, Honkawayacho, Nihonbashi, Tokyo. Director of various companies, including the Nippon Radio Telegraph and Telephone Company. Engaged in the successful litigation of the General Electric Company against some Japanese firms for infringement of the patents with respect to ductile tungsten. Author of several papers on wireless telegraphy. Address: Momosono, Nakano, Tokyo.

Klein, Rene Henri.—B. 1880, Souls sous Forêt, France, Licentiate in Consul of Sciences, Antwerp Consulate School, experimenter in wireless telegraphy since 1908. Founder and first Hon. Secretary of the Wireless Society of London 1913-1920, now Vice-President. In conjunction with H. L. McMichael was responsible for the new synthetic galena crystal, "Radiocite." Contributions to numerous journals. Served in R.A.F. 1916-1918 in Instructional Wireless Section. M.I.R.E. (Amer.) and Director of L. McMichael, Ltd., and B. Hesketh, Ltd., Wireless Engineers.

Kojima, Kiyoshi.—B. Tokyo, January, 1889. Graduated from the Science College of the Kyushu Imperial University, July, 1915. Entered the service of the Department of Communications and engaged in scientific researches at the Electrical Laboratory under Dr. Wichi Torikata. Joined Nippon Radio

Apparatus Manufacturing Company as chief of Engineering Department, April, 1916, and became a director when the above company was changed to the Nippon Radiotelegraphy and Telephony Co., Ltd., 1920. Address: 1280 Shimo-Shibuya, suburb of Tokyo.

Kolster, Frederick A.—B. Geneva, Switzerland, January 13th, 1883. Educ. Public Schools of Cambridge, Mass., and at Harvard University. Assistant to John Stone Stone 1902-08. Assistant to Lee De Forest, 1909-12, Chief of Radio Section, Bureau of Standards 1912-21, since when Research Engineer, Federal Telegraph Co. Attaché to American delegation representing the U.S. at London International Radio Convention, 1912. Author of: "Effects of Distributed Capacity in Coils," Procds. I.R.E.; "Re-enforced Harmonics in Radio Transmission," Procds. I.R.E.; "A Direct Reading Instrument for Measuring the Logarithmic Decrement of Electro-magnetic Waves," Bureau of Stds. S.P. 235; "The Radio Direction Finder and its Application to Navigation," Bureau of Stds. S.P. 428. Inventor of Kolster decremeter, Radio Compass and Position Finder, Directional Radio Systems, and other devices. Fellow I.R.E. (Amer.), Member I.E.E. (Amer.), Fellow G.S. (Amer.). Address: Cosmos Club, Washington, D.C.; Engineers Club, San Francisco, Cal.; or c/o Federal Telegraph Co., Palo Alto, California, U.S.A.

Koomans, Nicholas.—B. 1879, at Delft. Studied at Delft for mechanical and electro-technical engineer, obtaining his certificate 1901. For one year assistant in applied geometry, and for one and a half years in physics and electrical engineering at the Technical High School at Delft. Entered the Government Telegraph Service. Grad. 1908 at Technical High School at Delft as Doctor in Technical Sciences on the strength of a dissertation "Regarding the Influence of Self-Induction in Telephone Conducting Wires," containing theses in which are laid down the results of, and the conclusions from, experiments and measurements on Pupin cables of the Dutch telegraph administration. Joint-founder and editor of the Monthly Review of Telephony and Telegraphy. Joint-founder and member of the managing board of the Dutch Society for Radiotelegraphy (Nederlandsche Vereeniging voor Radiotelegrafie). Member of the International Electro-technical Commission. Member of State Patent Office. Professor in Physics and Theoretical Electrical Engineering at the school of the Dutch Post and Telegraph Administration. Supervises the instruction of all the higher officials. Address: Antonie Duyckstraat 24, The Hague, Holland.

Koto, Major-General, Teizo.—B. Yamaguchi prefecture, May, 1873. Entered the military service as cadet in the 6th Engineering Battalion, 1892, and promoted to 1st Lieutenant, May, 1898. Entered the Science College of the Tokyo Imperial University as a special student of School of Artillery and Engineering, 1900, and graduated therefrom 1903. Served in the Russo-Japanese War as the chief of the Field Telegraphy Corps, 1904. Promoted Major and appointed an inspector of the Military Technical Dept., 1905. Promoted Lieut.-Major and appointed Member of the Military Wireless Investigation Committee, 1910. Proceeded to China for the erection of a radio station on Chinwangtao Island, 1912. Promoted Colonel and Chief of the Communications Dept. of the Tsingtau Garrison, 1915. Engaged in the erection of radio stations at Hankow and Tsinan. Promoted Major-General

and Military Engineer, 1919. Address, 68, Tani-Machi, Ichigaya, Ushigome, Tokyo.

Korn, Professor Arthur.—B. Breslau, Germany, 1870. Studied at Leipsic and Paris in Mathematics and Physics. Professor of Physics, University of Munich, 1903-08. Best known as the inventor of a system of telegraphic transmission of photographs, and in 1907 the first photograph was transmitted under this system from Munich to Berlin, a distance of 600 kilometres. Inventor of a system of telautography and wireless phototelegraphy. Author of several mathematical works of a mechanical theory of gravitation and electricity and "Elektrische Fernphotographie und Aehnliches" Leipsic, 1904, and "Handbuch der Phototelegraphie und Telautographie," published in 1911 in collaboration with Dr. Glatzel. Professor at Polytechnical High School, Charlottenburg, Berlin. Address: Charlottenburg, Berlin Schlüterstrasse 25.

Krarup, T. F.—B. Copenhagen, 1868. Student 1885. Lawyer 1891. Head clerk to Criminal Judge at Frederiksberg, 1891. Assistant in the Ministry of Home Affairs, 1894. Assistant to Copenhagen Harbour Administration, 1896-1907. Head clerk to Ministry of Public Works, 1904; Chief from 1912. Vice-President of the Electricity Commission, 1907; Chairman from 1916. Chairman of the Cement Commission, 1917. Member and Secretary of the Telephone Commission of 1917, from 1917; Chairman from 1920. Chairman of the "Gudenaa" Commission and the other Commissions concerning water power plants, 1918, and of the Commission regarding Long Distance Radio Telegraph Stations. Knight of Dannebrog. At present Vice-President of the Danish Commission concerning the exchange of high-power current between Norway, Sweden and Denmark. Address: Frederiksberg Allé 55, Copenhagen V, Denmark.

Kroger, F. H.—Educ. University of Colorado. Graduated M.S. 1905. Apprenticed to the Westinghouse Electric and Manufacturing Co., East Pittsburg, 1905. Engineer at Brant Rock Transatlantic station of the National Electric Signalling Co., 1906. Radiotelegraph Adviser to the States Signal Corps (1907), which installed the Inland Radio Station in Alaska. Organised educational courses in electrical engineering and in radiotelegraphy at Cornell University, 1908-11. Joined the International Radiotelegraph Company, New York, 1911. Joined the Marconi Wireless Telegraph Company of America (1919) as division engineer at their factory. Joined staff Radio Corporation of America, 1920. Address: 85, Clarkson Avenue, Brooklyn, New York.

Kujirai, Tsunetaro.—B. 1882. Graduated Electrical College of Tokyo Imperial University, 1907. Sometime Wireless Engineer in the Department of Communications, Late Assistant and now Professor of the Tokyo Imperial University. Awarded the Academy prize and medal of the Japanese Imperial Academy. Member of the Institute of Physical and Chemical Research. Address: Tokyo Imperial University, Hongo, Tokyo, Japan.

Lagorio, Capitaine de Vaisseau.—Attached to Secus-Secrétariat des Pestes et des Télégraphes as director of Service de la T.S.F. (16th June, 1920). Address: Service de la T.S.F., République Française, Paris

Langmuir, Dr. Irving, M.A., Ph.D.—B. Brooklyn, New York, January 31st, 1881. Educ. School of Mines, Columbia University; Graduated 1903

as metallurgical engineer. Undertook post graduate work at University of Göttingen under Professor Nernst. Returned to America and became Instructor in Chemistry at the Stevens Institute of Technology, 1906-09. Entered Research Laboratory of G.E.C. at Schenectady, 1909, where his investigations have included Radio Telephone and Telegraphic Apparatus, Tungsten Lamps, Electric Heating Devices, Pure Electron Discharge Apparatus, Atomic and Molecular Structure, etc. During the war engaged on submarine problem and developed several successful detecting devices used by the United States Navy. Has been a frequent contributor to various scientific journals and published many scientific works. Addresses: G.E.C. Research Laboratory, Schenectady, New York. 6, Stratford Road, Schenectady, New York.

Latour, Marius.—B. October, 1875, in South-western district of France. Educ. University of Paris and Ecole Supérieure d'Electricité, Paris. For many years consulting Engineer to the General Electric Company of America. His inventions include improvements to the helicopter, submarine signalling and dynamo-electrical machinery. Paid special attention to the construction of high-frequency machines, which he originally attempted to design in the shape of monophasic or polyphasic machines grouped in cascade. Analysed the essential features of machines based on this principle, and showed their analogy and close relationship to those of Professor Goldschmidt. Designed the H.F. alternator with reduced number of stator slots known as the S.F.R. alternator installed at numerous stations, including Lyons and Caltano. Systematically studied the triode valve and originally propounded the four determining derivatives thereof. During the war engaged in research work at the laboratories of the Etablissement Central de la Télégraphie Militaire under General Ferrié. His system of elimination of the interference produced in telephone lines by neighbouring H.T. power lines has been installed throughout the whole of Northern France. Originally suggested and patented the system, now widely used, of H.F. multiplex telegraphy and telephony using triode valves for generation and reception. Has specialised in the development of high and low frequency valve amplifiers for the Société Française Radio-Electrique, of which he is Consulting Engineer. Chevalier de la Légion d'Honneur. Vice-President of the Société Française des Electriciens. Member of the American Institute of Electrical Engineers. Member of the Institute of Radio Engineers. Head Lecturer at the Ecole Supérieure d'Electricité. Address: 8, Square Desaix, Paris, XVe. Telephone: Saxe 85-88.

Lee, Major Albert G., M.C., B.Sc.—B. 1879. Entered Engineering Department of the Post Office 1903. Carried out some of the early experiments on loaded telephone lines. Served during war in France as O.C. No. 4 Telegraph Construction Coy. R.E., and later was Officer-in-Charge of Signals G.H.Q. British Delegate at International Technical Committee on Radio Communications, Paris 1921. Member of sub-committees of Radio Research Board on Thermionic Valves and also Radiotelephony. Head of Wireless Research G.P.O. Address: Engineering Department, G.P.O., London.

Lippmann, Gabriel.—Of the Académie des Sciences at the Bureau des Longitudes. Commander of the Legion of Honour. Director of Laboratory of the Ecole des Hautes-Etudes.

Professor at the Sorbonne. President of the Interministerial Commission on Wireless Telegraphy. Occupied primarily with electrical matters. Inventor of an apparatus employed in Military Wireless Telegraphy for receiving Wireless Time Signals. Foreign Member of the Royal Society of London. Address: Sous-Secrétariat d'Etat des Postes et Télégraphes, Paris.

Liström, Axle Sigurd.—B. Falun, Dalecarlia, September 3rd, 1881. Passed Maturity Examination, 1900. Examination of Electro-Technical Branch, Technical University, Stockholm, 1905. Entered the Telegraph Service, 1900. Inspector of wireless installations, 1913. Chief Engineer at the Radio Division of the Royal Telegraph Administration, Stockholm, 1920.

Ljungqvist, Seth.—B. Falun, Dalecarlia, Sweden, May 5th, 1880. Passed Maturity Examination, 1899, and Examination of Electro-Technical Branch, Technical University, Stockholm, 1904. Entered the Telegraph Service, 1899. Chief of the Radio Division in the Royal Swedish Telegraph Department, Stockholm, 1916. Address: Vanadisvägen 23, Stockholm.

Lodge, Sir Oliver, D.Sc., F.R.S.—B. Penkhal, Stalis, June 12th, 1851. Educ. at Newport (Salop) Grammar School; studied privately for several years. Entered University College, London, 1873. Graduated D.Sc. 1878. Reader in natural philosophy at Bedford College for Women, and Assistant Professor of Physics in University College, London, for several years and Professor of Physics at University College, Liverpool, 1881-1900. The First Principal of Birmingham University, 1900. Knighted, 1902. Original investigations on lightning, the seat of the electromotive force in the voltaic cell, the phenomena of electrolysis and the speed of the ion, the motion of the ether near the earth, and electromagnetic waves and wireless telegraphy. His patent (1897) for syntonic wireless telegraphy was extended for seven years by Lord Parker, and was acquired by the Marconi Co. in 1911. Has held the position of President of the British Association, President of the Physical Society, and of the Society for Psychical Research. Has made many important contributions to the literature of science, amongst which are "Modern Views of Electricity" (Macmillan), "Electrons" (Ball), "The Ether of Space" (Harper's), "Electro-Mechanics" (Chambers). Address: Normanton, Lake, Salisbury.

Loflin, Edward Hill, Lieut.-Commander, U.S. Navy.—B. Deatesville, Alabama, 1885. Educ. Public Schools, Pensacola, Florida. Appointed to U.S. Naval Academy from Third Congressional District, Florida, and entered 1904; graduated 1908. 1912 to 1913 in command of U.S. Torpedo Boat "Bailey," engaged in special radio experimental work for Navy Department. 1913 to 1914 Post-graduate School, Annapolis, Maryland. 1914 to 1915 Post-graduate work in radio and electrical engineering, Columbia University, with degree of Master of Arts. 1916 to 1917, District Radio Communication Superintendent, Eighth Naval District, with additional special duty in development of radio for naval aircraft. 1917 Radio Officer Battleship Division Five, Atlantic Fleet. 1917 to 1918, Radio Officer for U.S. Naval Aviation Forces, Foreign Service. 1918 Communication Officer, U.S. Naval Forces in France, followed by special duties, liaison between U.S. Navy and French Government for construction of Lafayette High Power Radio Station and establishment of a radio communication service between Europe and the United States in case of failure of cables.

Member of Inter-allied Radio Conference. Member of Inter-allied Code and Signal Conference. 1918 to date, Radio Division, Bureau of Engineering, Navy Department, in charge of Research and Patents. Special duty 1919 to 1921, Chairman of Interdepartmental Radio Board to make recommendations on claims against the Government for use of radio patents. 1921, member of the American Delegation to the meeting, in Paris, of the Provisional Technical Committee of the International Communications Conference.

Loring, Commander F. G., R.N.—Inspector of Wireless Telegraphy General Post Office. Entered the Navy in 1882 (retired 1910). Lieutenant on H.M.S. "Victoria" when that vessel was rammed and sunk by H.M.S. "Camperdown" off Tripoli (1893). Received Bronze Medal of Royal Humane Society for saving two lives. In charge of Admiralty shore wireless stations 1902-08. Admiralty delegate at Berlin International Conference on Wireless Telegraphy, 1906. Appointed Inspector of Wireless Telegraphy, 1908. Post Office delegate at International Conference on Wireless Telegraphy, London, 1912. Technical Adviser to the Board of Trade on Wireless matters at International Conference on Safety of Life at Sea, London, 1914. Address: The Old House, Foot's Cray, Kent.

Lyons, Colonel Henry George, D.Sc., F.R.S.—B. October 11th, 1864. Educ. Wellington College, Director-General of the Survey Department in Egypt, 1898-1909. Victoria Research Medal, R. Geog. Soc., 1911. Lymans Gold Medal of Royal Meteorological Society, 1922. Member of the Meteorological Committee, 1913. Commandant Army Meteorological Services during the War; Acting Director Meteorological Office, 1918-19. Chairman of Sub-Committee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Chairman National Committee for Geodesy and Geophysics. Director and Secretary Science Museum. Address: 3, Cambridge Square, W.2.

Machado, Alvaro de Melo.—B. February 22nd, 1883. Entered Portuguese Naval Service, 1904. Commander and Torpedo Operating Officer of the Naval College of Val de Zebro, and elected Member of Portuguese Academy of Science for his original design of wireless-controlled torpedo in 1907. In 1915, whilst only Second Lieutenant became Manager of the Electrical Services of the Marine Arsenal and was responsible for the direction of the installations made in the National Naval Units and Land Stations of the Navy. Reorganised the dismantled wireless on German vessels, confiscated during the war. Received Portuguese Distinguished Service Medal, and made Member of the "Académie Française" in 1917, in acknowledgement of his wireless work. Address: Ministry of Commerce, Lisbon.

Makower, Capt. W., M.A., D.Sc.—B. December 6th, 1879. Educ. University College School and University College, London. Took honours degree in Chemistry at the University of London, 1900. His early research work relates to investigations in heat, but on proceeding to Trinity College, Cambridge, 1902, commenced investigations at the Cavendish Laboratory on radio activity. Elected to a Research Fellowship in the University of Manchester. Subsequently Assistant Director of the Physical Laboratories. Continued these researches until 1917. Joined the R.N.V.R. as a lieutenant, 1917, and subsequently became captain in the R.A.F. During the war, at the Air Ministry Laboratory in the

Imperial College of Science and Technology, working on thermionic valves and other matters connected with wireless telegraphy. Since the Armistice has been engaged on various problems connected with wireless telegraphy and navigation being investigated at the Air Ministry Laboratory. Most of his scientific publications have been in connection with radio-activity, of which, perhaps, the most important are on the subject of radio-active recoil, which he discovered with Dr. S. Russ in 1909, and he was awarded the degree of D.Sc. at London as a result of his early investigations in this subject. Of his other contributions to Science are his work on the Electric State of the Upper Atmosphere and his books on Radio-Active Substances and Practical Measurements in Radio-activity. Elected a fellow of University College, London, 1912, and for some years past has acted as Recorder of Section "A" of the British Association.

Makower, A. J.—B. May 9th, 1876. Educ. University College School, Gower Street, and at the College itself, between 1884 and 1895. Studied mathematics at Trinity College, Cambridge, taking his degree, 1898. Proceeded to Technical School, Charlottenburg, Germany, and obtained valuable insight into German methods. Joined the British Thomson-Houston Company, Rugby. Received an appointment at the South-Western Polytechnic, Chelsea, 1904. As head of the Electrical Engineering Department at the Polytechnic, was closely connected with the University of London, of which he was a teacher. At one time Secretary of the Board of Studies in Electrical Engineering, and Chairman of the Board of Examiners in Electrical Engineering. Author of many papers on wireless subjects. Resigned his teaching post and became managing director of Mossay & Co., Ltd., designers and selling agents for commercial electric vehicles, 1918. Chairman of the Electric Vehicle Committee of the Society of Motor Manufacturers and Traders. Addresses: 12, Greencroft Gardens, N.W.6, National Liberal Club, and The Oxford and Cambridge Musical Club, and 7, Prince's Street, S.W.

Marchant, Edgar Walford, D.Sc.—B. 1876. Educ. University College, Hastings, and Central Technical College. Graduated B.Sc. at London University with honours in physics and mathematics, and subsequently took the degree of D.Sc. After serving an apprenticeship appointed Superintendent of Lord Blythwood's Laboratory and Workshops at Renfrew, N.B., 1897, where he carried out many experiments in wireless telegraphy. Leaving Renfrew in 1900, served as chief assistant for one year at the Finsbury Technical College under the late Professor Silvanus P. Thompson. Lecturer in electro-technics at University College, Liverpool, 1901, and on the establishment of a Chair of Electrical Engineering in 1903 was elected the first professor. Closely associated with the late Mr. Duddell in the development of the oscillograph and joint author of a paper read before the Institution of Electrical Engineers on the study of the electric arc by the aid of oscillographs. Author of a number of articles on wireless and cognate subjects. David Jardine Professor of Electrical Engineering in the University of Liverpool. Vice-President of the Institution of Electrical Engineers. Member of British National Committee of Radiotelegraphy. Vice-President of the Radio Society of Great Britain. Past President of the Liverpool Engineering Society, Past Chairman of the Manchester Section of the Institution of Electrical Engineers. Address: 2, Ivanhoe Road, Sefton Road.

Liverpool. University Club, Liverpool, Royal Liverpool Club.

Marchant, W. H..—B. London, March 22nd, 1881. Commenced experimental work in connection with W/T (1904). From 1906-11 he served with De Forest Syndicate, Poulsen Company, and Lepel and Anglo-German W/T Companies, being chiefly engaged in experimental work. Since 1911 he has devoted himself mainly to literary work and to teaching. At present in the service of the Eastern Telegraph Co., at their London training-centre. Address: 4, Branch Hill Side, Hampstead, N.W.

Marconi, Alfonso.—B. Bologna, 1865. Educ. Bedford Grammar School, England, and Technical Colleges in Florence and Leghorn. Assisted his brother in carrying out his first experiments in Wireless Telegraphy on one of his father's estates near Bologna. Joined the board of Marconi's Wireless Telegraph Company and the Marconi International Marine Communication Co., Ltd., July, 1909. Addresses: D2, The Albany, Piccadilly, London, W., The Bath Club, Dover Street, W., Royal Thames Yacht Club, 80, Piccadilly, W.

Marconi, Senatore Guglielmo, G.C.V.O., LL.D., D.Sc.—B. Bologna, Italy, April 25th, 1874. Irish on his mother's side. Educ. Leghorn and Bologna. First interested himself in the problem of wireless telegraphy, 1895. Visited England, 1896, and took out the first patent ever granted for a practical system of wireless telegraphy by the use of electric waves. Earliest experiments in England made at Westbourne Park. Shortly afterwards made some experiments for the Post Office officials. The Italian Government conferred upon him the honour of knighthood. He has been decorated by the King of Italy and the late ex-Czar of Russia, is an honorary doctor of many universities, including Oxford, Glasgow, Aberdeen, Liverpool, and Pennsylvania, besides having received the freedom of the principal Italian cities. In 1909 (in conjunction with Professor Braun) he was awarded the Nobel Prize for Physics. In 1912 he was decorated with the Grand Cross of Alfonso XII and made Grand Officer of the Order of St. Maurice and Lazarus. Elected a senator in the Italian Parliament (1914), being formally introduced to the Assembly on March 27th, 1915. On July 24th, 1914, the King bestowed upon him the Honorary Knighthood of the Grand Cross of the Victorian Order. He also holds many scientific awards granted by various societies and institutions, including the Albert Medal of the Royal Society of Arts, of which he is Vice-President. April 12th, 1915, Awarded the Gold Medal of I.R.E. (America) College of the City of New York, June 20th, 1922, and John Fritz Gold Medal for the Invention of Wireless Telegraphy, July 6th, 1922. Immediately on the declaration of war by Italy, he was given the rank of Lieutenant in the Italian Army. He has been employed on important military missions to England by the Italian Government, and on July 29th, 1916, was promoted Captain "for exceptional services." At the beginning of September, 1916, he was transferred from the Italian Engineer Service to be temporary Commander in the Navy. He visited the United States, 1917, as Member of the Official Mission sent by Italy to the U.S.A. Government. The University of Columbia invested him with the honorary degree of Doctor of Science on June 6th, 1917. The Franklin Institute of Philadelphia conferred their Franklin Gold Medal upon him on May 15th, 1918. On June 26th, 1919, he

was appointed by H.M. the King of Italy Plenipotentiary Delegate to the Peace Conference at Paris, and in this capacity he signed the Peace Treaties with Austria and Bulgaria. At the end of 1919, he was awarded the Italian Military Cross. He has been decorated with the Italian "Ordine Civile" of Savoy, and has been nominated by the King of Italy to be a member of the Supreme Council of the same Order on the proposal of Signor Giolitti. He is Chairman of the Board of Directors of the Marconi Company. Address: Marconi House, Strand, W.C.2.

Marriott, Robert Henry.—B. 1879. First experimented with wireless telegraphy in 1899, while student at the Ohio State University, U.S.A. Employed by the American Wireless Telephone and Telegraph Company, Philadelphia, 1901, for which company he erected stations at Breille, Galilee and Barnegat, N.J. Chief Engineer of the Pacific and Continental Wireless Telephone and Telegraph Company. Installed three stations in California, at Avalon, Santa Catalina Island, and San Pedro, 1902. Employed with the Carstarphen Electric Company at Denver, Colorado, 1903. Constructed stations for the American De Forest Wireless Telegraph Company, and its successor, the United Wireless Telegraph Company, in Colorado, Wyoming, and Texas, 1905. In charge of this Company's construction and maintenance, 1910. Entered Marconi Wireless Telegraph Company of America, 1911. Entered the U.S. Government service as Radio Inspector, 1912. Chairman, 1916, Seattle Section Institute of Radio Engineers. Member of the Committee on Standardisation. Fellow and Past-President, The Wireless Institute, 1909-12.

Marvá, General J.—B. 1846. Practically the pioneer of Wireless Telegraphy in the Spanish Army. Founder of first Spanish Aerodrome at Cuatro Vientos. Author of many scientific works (*Mecánica aplicada a las construcciones, Tracción en ferreas, etc.*), Member, Royal Academy of Sciences, and International Association for experiments of materials.

McLachlan, Norman W., D.Sc. (Eng.).—B. Longtown, Cumberland, 1888. Educ. Carlisle Grammar School and the George Watson and the Heriot-Watt Colleges, Edinburgh, and Liverpool University. Served apprenticeship with Messrs. Bruce, Peebles & Co., In 1909 was appointed Lecturer in Engineering and Mathematics at Newcastle-on-Tyne. In 1913 Head of a Technical Institute, and Supervisor of Classes in Engineering Subjects in the Liverpool Technical Institutes. During the war carried out much research work for Government in aeronautics and anti-submarine devices organising a laboratory at Air Ministry for research on liquid and gaseous oxygen apparatus for aircraft use. After the Armistice engaged in magneto research at the National Physical Laboratory, Teddington. At present Research Engineer in service of Marconi Company. Associate of the Heriot-Watt College and a D.Sc. (Engineering) of the University of London. M.I.E.E., Fellow P.S. Lond. Fellow Inst.P. Author of many papers on various subjects in the Journal of the Institution of Electrical Engineers and other scientific journals. Holds patents for Wireless Telegraphy and allied subjects. Addresses: Marconi Works, Chelmsford and Engineers' Club.

McMichael, H. Leslie.—B. Birkenhead, 1884. Educ. Ackworth and Mason College, Birmingham. Apprenticed to Messrs. Duckett and Brown, Electrical Engineers, Birmingham, afterwards taking control of one branch of the

business. Among the first to hold a receiving and transmitting license in London and had a highly efficient station in London prior to 1914. His experimental work lay chiefly in the direction of sensitive synthetic crystals, and with Mr. R. H. Klein he was responsible for the synthetic crystal "Radiocite." One of the moving spirits in the foundation of the Wireless Society of London, and has taken an important part in its management since its origin; first in the office of Vice-Chairman, and since 1919 as Honorary Secretary of the Society. During the war served in the Wireless Instructional Section of the R.A.F., and now actively engaged in the wireless industry as Managing Director of L. McMichael, Ltd. Also a Director of B. Hesketh, Ltd., and other commercial concerns. M.I.R.E. Honorary Secretary, Wireless Society of London. Address: 32, Quex Road, West Hampstead, N.W.6.

McPherson, Andrew.—B. 1880. Educ. at Allen Glen's School and the Royal Technical College, Glasgow. Engineering Training with the Electric Construction Co., Ltd., of Wolverhampton. Was appointed Assistant Engineer to the Public Works Department of the Nigerian Government, Chief Engineer of the Nova Empresa Luz Electrica, Maceio, Brazil, and later Engineer and Manager of the Madeira Electric Lighting and Power (1909) Co., Ltd., Funchal, Madiera. Was for some time acting as special Brazilian correspondent to the "Electrical Review." Joined the G.P.O. in connection with the original scheme for the Imperial Wireless Chain, and in 1915 was transferred to the Admiralty in connection with Wireless Telegraphy Engineering. From 1915 to 1917 was engaged in inspecting and reporting on Wireless Telegraphy Stations abroad, visiting practically all Naval Overseas Wireless Telegraph Stations in every part of the world. At present Head of the Wireless Shore Station Division of H.M. Signal School, Portsmouth. Address: 22, Cousin's Grove, Southsea, Hants.

Mesny, Rene.—B. 1874, at Brest. Educ. Lycee de Brest, then Naval School. Naval Officer in 1894. Prof. of Naval Constructions to the Naval School in 1901, then Prof. of Hydrography. During the War appointed to the T.S.F. Radio Service—is specially occupied with Direction-Finding on land and sea. Attached to le Laboratoire de la Radiotélégraphie Militaire. Officer of the Legion of Honour.

Meissner, Alexander, Dr. Eng.—B. Vienna (Austria), 1883. Studied at Technical High School and University, Vienna; became assistant at the Technical High School. Joined the Laboratory of the Telefunken Company, Berlin, 1907, and since that time has taken a very prominent part there in the development of the technique of wireless in Germany, having been responsible for the introduction of the Flat-coil, the most favourable diameter for high frequency coils, musical quenched sparks, timed sparks, Telefunken compass, interference-reception, direct current cathode valve relay for Morse reception, etc. Invented the generation of oscillations with three electrode valves, 1913, as well as the triode, with back coupling for reception by beats. Has published a series of articles on his work in different periodicals. Address: Burg Lauenstein, Ouerfranken.

Minohara, Dr. Eng., Lieut.-Com. (of Ordnance), Tsutomu.—Graduated from the Tokyo Imperial University, 1907. Entered Naval Arsenal of Maizuru and Kure and engaged in the manufacture of electrical equipment for radiotelegraphy, Member of the Wireless Research Laboratory in

the Electrical Department of the Arsenal, 1912. Proceeded to France and Germany to study, 1914. Ordered home in consequence of the outbreak of the Great War, and resumed service at the wireless laboratory. Inspector of *post-bellum* condition of radiotelegraphy amongst the Allied Powers. Returned to Japan, 1918, and assumed service at the wireless laboratory again. Now engaged in the equipment of radiotelegraphy aboard war vessels and construction of high-power land stations at the electro-technical section in the naval department; also employed in the improvement of continuous wave radio apparatus at the laboratory. Appointed to serve in the Department of Communications, 1919, and juror of Patent Office, 1920.

Monckton, C. C. F.—B. Great Malvern, May 8th, 1867. Educ. at Uppingham and Malvern Colleges, and at the Central Technical College of the City Guilds. Employed by the Brush Electrical Engineering Company, from whom he passed to Messrs. Boustead Brothers, of Ceylon. Filled Government appointments in Jamaica and Trinidad. Superintendent of Telegraphs and Telephones to the Government of Fiji, 1911. Censor of telegrams during the war. Superintended the erection of the first Colonial Wireless Stations in the West Indies, 1904. Author "Radiotelegraphy" (1907). Acts in an advisory capacity to the High Commissioner for the Western Pacific with regard to all matters relating to wireless in the territories under that official's jurisdiction. Address: Suva, Fiji Islands.

Montefinale, Commander G. R.—B. 1881. Educ. at Technical Colleges in Italy. Entered Naval Academy, Leghorn, 1899. Officer of the R.N., 1903. First appointment on H.I.M.S. "Andrea Doria," one of the first warships fitted with W/T. Assisted on board these vessels at important experiments in Adriatic and Ionian Seas while Mr. Marconi and Marquis Solari experimented with new receiving devices at Ancona. W/T teacher at the R.N. Telegraphist School, 1908-10. Landed on Benadir coast, 1911, where he took part in erection of high-power Marconi station at Mogadiscio. During the Turkish-Italian war served in the Red Sea flotilla blockading Arabian coasts as W/T officer, Director of Radiotelegraphic service in the Italian Somaliland, 1912-14, visiting the whole region, taking part in all the most important occupations and establishing new wireless links in the boundary zone (Mahaddi-Uen, Iscia Baidoa, etc.). After a period of studies at Leghorn served in the Dreadnought squadron for a long period of the war. In December, 1916, while attached to the Inter-allied staff of Brindisi, sent to Red Sea as Director Erytrea W/T of service. Remained in the Marconi H.P. station of Massawa till the Armistice, co-operating with British authorities in Aden and Egypt to establish new links. Constructed a duplex station at Asmara for metropolitan W/T service. During the summer, 1918, gave a demonstration of long distance reception in Abyssinia. Chief of W/T Laboratory and Department of Spezia, June, 1919. Author of several papers on wireless telegraphy. Active correspondent of various periodicals and reviews. Member of the specialist body of the Italian Navy.

Moreno Quesada, D. Manuel, Lieut.-Com.—B. Madrid, January, 1876. Educ. B.A. Seville University, St. Ferdinand Training School for the Navy, Navy School at Ferrol, Torpedo School for Officers at Cartagena. Electrical engineering course at the Central Technical

College (London University). Commander Spanish Royal Navy. Chief Engineer (Sub-Director, and at present Technical Adviser, of the *Ca Nacional de Telegrafia sin Hilos* Spain). Member of the Spanish Parliament. Associate I.E.E. of Great Britain. Member I.R.E. (Amer.). Contributed articles on subjects of torpedo craft, wireless telegraphy and gyroscopic compasses in *La Revista de Marina* (Navy Review), Madrid. Address: *Ca. Nac. de Telegrafia Sin Hilos*, Madrid.

Moriceau, Gaston, Capitaine (of Colonial Artillery).—B. Doué-la-Fontaine (France), 15th September, 1879. Studied (1900-1902), *Ecole Polytechnique* of Paris. Sub-Lieutenant Colonial Artillery, 1902. Before the war served at the Central Radiotelegraphic Military Establishment. During the war Chief of the Radiotelegraphic Service of French Indo-China (except from May, 1915, to May, 1916, when he served in Society Islands). Technical Adviser in Wireless Telegraphy (since February, 1921), French Colonial Office.

Mullard, S. R., M.B.E.—B. 1884. Educ. Private and London Electrical Engineering Colleges. Apprenticed to London firm of electrical engineers; 1908, Assistant Works Manager *Société Anonyme de Usines Pintsch*. 1910 to 1915, Head of Research Laboratory, Edison & Swan, Ltd. (here developed the "Pointolite" arc lamp). 1916 to 1918, Lieut. R.N.V.R., attached to R.N.A.S. for wireless duties. 1918 to 1919, Capt. R.A.F., Head of Wireless Section Research Laboratory, Imperial College of Science, on behalf of Air Ministry. 1919 to 1920, Research in wireless valve manufacture and development. Contractor to H.M. Government for wireless valves. September, 1920, formed the Mullard Radio Valve Co., Ltd. Appointed Managing Director of the Company. Addresses: Orient House, New Broad Street, E.C.2, and R.A.F. Club.

Nally, Edward Julian.—B. in Philadelphia, April 11th, 1859, and educ. in the Public Schools. Pioneer in different modes of communication in America, having had charge of the first Edison telephone in St. Louis, Missouri, before he had obtained his majority. Started business career as a messenger boy for the Western Union Telegraph Company, in St. Louis, and worked his way up through various steps to the position of Vice-President and General Manager of the Postal Telegraph-Cable Company, which he resigned in 1913 to accept the office of Vice-President and General Manager of the Marconi Wireless Telegraph Company of America. Under his management the first commercial wireless circuit was opened to the public between the United States and Japan, in 1914. During the period of the war commercial wireless service by private companies was interrupted, but immediately upon the return of the stations by the United States Government on March 1st, 1920, he established the first direct commercial wireless circuit between the United States and Great Britain, which was soon followed by similar services to Norway, Germany, and France. Upon the formation of the Radio Corporation of America, in 1919, he was elected President and Director, from which position he resigned in 1922 to become Managing Director of International Relations (R.C.A.). Also President and Director of the Pan-American Wireless Telegraph and Telephone Company and the Wireless Press, Inc. Married Lee Warren Redd, of Lexington, Kentucky, June 10th, 1897. Children, Marylee Nally, Hahn and Edward Julian Nally, Jr. Clubs: Caxton, Brothers of

the Book, Lawyers', Pennsylvania Society, American Irish Historical Society, Friendly Sons of St. Patrick, American Geographical Society, National Geographic Society, Ends of the Earth. Residence: The Trees, Ossining, N.Y. Business address: Woolworth Building, New York.

Navarro y Ortiz, D. Benito, Major, Spanish Royal Engineers.—Chief of the Wireless Service of the Army permanent land stations (1918). In 1913 took charge of the Spanish Army Station of Carabanchel EGC (Madrid), until 1918. Decorated by the Spanish Government with the White Military Cross (December, 1919) for his knowledge and merit in wireless matters. Has contributed largely to the development of wireless telegraphy in Spain.

Nieholls, Lt.-Col., Hon. Frederic, J.P. (1911).—B. England, November 23rd, 1856. Educ. Stuttgart, Germany. Went to Canada 1874. Founder of "Canadian Manufacturer," the then Official Organ and Spokesman of the manufacturing interest in Canada, of which he was editor and proprietor until 1893. Consul for Portugal. President Toronto Press Club, 1890. President Athenæum Club, 1893. Life Member Board of Trade. Hon. Member Canadian Press Association. Member Executive Committee, Canadian Manufacturers' Association. Gazetted Hon. Lieut.-Col., October 17th, 1914. Appointed to Senate January 20th, 1917. President and/or Director of many industrial and electrical concerns. President Marconi Wireless Telegraph Co. of Canada, Ltd. Conservative; Anglican. Clubs: Bankers' Club of America, New York; York, Toronto; Albany; Engineers'; etc., etc. Address: 79, St. George Street, Toronto, Ontario, Canada.

Nicholson, Commander Richard Lindsay, D.S.O., late Royal Navy.—Born in London, 1882. Educ. privately; "Britannia." Entered Royal Navy, 1898. Served as wireless officer on the staff of H.M.S. "Vernon" afterwards in the 2nd and 3rd Divisions of the Home Fleet, subsequently being transferred to the 2nd Division under Lord (then Sir John) Jellicoe. Subsequently qualified for the Naval War Staff, and served on the Admiralty Committee (1914) which revised the Naval wireless telegraph and signal books, etc. In July, 1914, was appointed wireless telegraph officer on Lord Jellicoe's staff, and in September of that year was appointed Fleet wireless telegraph officer of the Grand Fleet, vacating this appointment in February 1917, on being appointed to the Admiralty. While Fleet wireless telegraph officer of the Grand Fleet, Commander Nicholson served on the staff of Lord Jellicoe and then on that of Earl Beattie, and devised and introduced an improved form of wireless procedure for use in the Fleet, which was adopted throughout the Royal Navy and subsequently by the Allied Navies. Present at the battle of Jutland, promoted to Commander R.N., and appointed D.S.O., the wireless telegraph work of the Fleet being specially commended by Lord Jellicoe in his dispatches. Appointed Director of Signal Division of the Naval Staff at the Admiralty in 1917, with the rank of Acting Captain, R.N., and retained this appointment until November, 1919. Retired from the R.N. July, 1920. January, 1921, appointed Director of Wireless Telegraphy under the Government, India. During service as Director of Signals at the Admiralty proposed and carried to fruition the formation of the "Wireless Board" and "Imperial Communications Committee." Has always evinced keen interest in

Imperial Wireless Communications and constantly urged that an efficient organisation in this respect is an essential and pressing need of the Empire. Officer of the Legion of Honour, Commendatore of the Crown of Italy. Address: Director of Wireless, India.

Noble, Sir William.—B. 1861. Educ. Public Schools and Gordon's College, Aberdeen. Commenced his career in Aberdeen Telegraph Office as a telegraphist. In 1893, Engineer for the north-east area of Scotland with headquarters at Aberdeen. In 1897 promoted to Headquarters, London, as First-class Engineer. Subsequently successively Technical Officer, Assistant Superintending Engineer, London, Staff Engineer at Headquarters, Superintending Engineer, London, and in 1912 Assistant-Engineer-in-Chief, succeeding to the premier position in June, 1919. Retired January, 1922. Now Director of General Electric Co., and of British Broadcasting Co. In 1919 the King of the Belgians created him a "Chevalier de l'Ordre de la Couronne" for "constant and generous help" during the war. Knighted June, 1920. Contributed articles to "Encyclopædia Britannica" on Telephony and Telephony, and paper to I.E.E. M.I.E.E., Inst. P.O.E.E. Addresses: Engineers' Club, Royal Automobile Club, and National Liberal Club, The Chase, Blackdown, Leamington Spa, and Magnet House, Kingsway, W.C.2.

Norman, Major the Rt. Hon. Sir Henry, B.A., 1st Bt. cr. 1915, Kt. cr. 1906: M.P. (L) Blackburn since 1910.—B. Leicester, September 19th, 1858. Educ. privately in France; Harvard University (B.A.); Leipzig University. Officer of the Legion of Honour; Commander of Order of the Saviour; Officer of S.S. "Maurice" and "Lazare," and Crown of Belgium. Assistant Postmaster-General, 1910; Chairman War Office Committee on W/T (1912); Member of Committee on National Telegraphic Research and P.O. Telegraph Organisation Committee; Member of British Association Committee of Radiotelegraphic Investigation and of International Committee of Radiotelegraphic Research; Chairman of Imperial Wireless Telegraphy Committee (reported May, 1920); Vice-President of Radio Society of Great Britain; Fellow of Physical Society; Fellow of American Institute of Radio Engineers; Liaison Officer with French Government for Military Inventions; Vice-Chairman Imperial Communications Committee, and Chairman of Wireless Sub-Committee. Addresses: The Corner House, Cowley Street, S.W.1; Honeyhanger, Hindhead, Surrey. Clubs: Reform, Royal Automobile, Ranelagh.

Orme, Major Robert, B.A.—B. at Bray (Ireland), October 20th, 1865. Educ. in Irish schools and graduated B.A. at Trinity College, Dublin. Initiated career by taking up Electrical Engineering under Hugh E. Harrison at Hammond College, and then apprenticed to Anglo-American Brush Company. Since 1900 concentrated chiefly on wireless telegraphy and atmospheric electricity. Granted commission in R.F.C. January, 1915, organised and was given command of the Wireless School, Brooklands, November, 1915. Moved himself and his staff from Brooklands to Biggin Hill in September, 1916, where they were constituted first as the Wireless Testing Park and later as the Experimental Establishment, R.F.C. Address: Hollycroft, East End, Newbury, Berks.

Pannill, Charles Jackson.—B. Petersburg, Va., May 13th, 1879. Entered Navy 1898, Chief Telegraphist of United States Coast Signal Service. Entered service of Professor

Reginald A. Fessenden, 1902. Conducted experiments in radio communication across Hampton Roads. Installed communication by radio between New York and Philadelphia, 1903. Installed first radio outfit on United States battleship. Conducted experiments between stations of General Electric Company at Lynn and Schenectady; also between Brant Rock, Mass., and Machrihanish Bay, Scotland. Holds commercial first-grade license No. 1. Entered service of United Wireless Telegraph Company as Division Superintendent, 1909. Erected shore radio stations on Great Lakes, later in charge of division south of New York. Entered service of Marconi Wireless Telegraph Company of America, 1912. Superintendent, Southern Division. Entered service of United States Government, 1914, as expert radio aid, Naval Radio Service. Promoted to Assistant to Director Naval Communications in charge of commercial radio service, 1917. Now General Manager, Independent Wireless Telegraph Company, New York. Fellow of the Institute of Radio Engineers. Member Washington Society of Engineers, Member of the Geographical Society.

Parker, J. N.—B. July 6th, 1881, in Calcutta. Son of the late Major-General N. F. Parker, of the Bengal Army. Educ. Clifton College and the Royal Indian Engineering College, Coopers Hill. Passed out of the latter institution (1902) with diploma of Associate. Joined Indian Government Telegraph Department. Appointed to Electrical Engineer's Office, Calcutta, January, 1904. Accompanied Mr. M. G. Simpson, then Electrical Engineer-in-Chief, to Burma, February, 1904, to assist in establishing wireless communication with the Andamans. Continued his connection with the Electrical Engineer's Office and the technical side of telegraph work, which included the erection of several of the 30-kw. Marconi stations belonging to the Department. Superintendent Indian Wireless Telegraph Stations, 1914-19. Represented the Post and Telegraph Department at Poona in connection with the erection of the Imperial Chain Station, until work stopped early in 1915. Represented the Indian Post and Telegraph Department in England at the India Stores Depot, 1920-22. A.M.I.E.E. Member of the East Indian United Services Club, 16, St. James Square, Bengal Club, Calcutta, Royal Bombay Yacht Club. Address: Messrs. Grindley & Co., 54, Parliament Street, Whitehall.

Pedersen, P. O.—B. at Sig, near Varde Jutland, June 19th, 1874. Entered Royal Technical College, Copenhagen (1892). Cand. Polytechnic (1897). Chief Engineer of Telegrafonen, Ltd. (Poulsen Patent), 1899-1902. Gold Medal Danish Society of Sciences (1907). Lecturer at the Royal Technical College, Copenhagen, and Professor from 1912. On board of Dansk Telegrafonfabrik (Danish Telegraphone Co., Ltd.), 1903-12, as well as on Elektroteknisk Forening (Electrotechnical Association) from 1910; Chairman from 1916. President Danish Institute of Civil Engineers, 1922. Director of Det Kontinentale Syndikat for Poulsen Radiotelegrafi (Continental Syndicate for Poulsen Radiotelegraphy) from 1911-19. Member of International Electrotechnical Commission. Fellow Inst. of Radio Engineers since 1915. Fellow Am. Inst. Electrical Engineers since 1920, and a Fellow Royal Danish Academy of Science since 1917. Member of the Telephone Commission (1917), of the Control Committee of licensed Telephone Companies, of the Commission on the training of radio operators, and of the Radio Commission of 1920. Technical Adviser in Radio to the Department of Public Works,

1922. Principal of and Professor in the Royal Technical College, Copenhagen. His contributions to electrotechnical literature have been both important and numerous. Amongst those of recent appearance we may enumerate the following: "Om Poulsen-Buens Teori" (Copenhagen, 1917); "On the Theory of the Poulsen Arc" (Proc. Inst. Rad. Eng., New York), 1917; and 1919; "Poulsen-Buens Virkemaade"; *Fysisk Tidsskrift*, Vol. xvii (Copenhagen, 1918); "Den Elektriske Buens Elektroteori" (*Elektrotekniker*, Copenhagen, 1917); "The Lichtenberg Figures" (Copenhagen, 1918); and "Townsend's Teori for Steodonisation" (Copenhagen, 1918). Address: Amalievej 1, Copenhagen, V. Denmark.

Penido, Antonio Nogueira.—B. September 25th, 1864, at Juiz de Fora, Minas Geraes Civil Engineer of the "Escola Polytechnica," of Rio de Janeiro (diploma March, 1886). Was engaged in the construction of the Central Railway of Brazil; the Recife-Caruari Railway, the Sorocabana Railway; "port works of Rio de Janeiro and works at Saneamento of the town of Juiz de Fora. Successively Engineer of Public Works of the State of São Paulo, Chief of Traffic of the Sorocabana Railway, Chief Engineer of the Itapura-Corumbá Railway, and Inspector-General of the Mogyana Railway. Director-General of Brazilian Telegraphs (since 1918).

Péri, T. M., Commandant of Colonial Infantry. Officer of the Legion of Honour. He inaugurated the wireless chain in Indo-China, which comprises fifteen transmitting and receiving and two direction finding stations. During the war he superintended the construction of the high-power radio station at la Doua (Lyons), and on the 21st September, 1914, secured communication with Russia and later with America. Introduced the first C.W. apparatus for aircraft, employing vacuum tubes of his own invention. Co-inventor of the French valve (patented by Péri and Biguet, and subsequently acquired by the Marconi Company). Inventor in France of the resistance coupled amplifier (patent subsequently acquired by the Société Française Radioélectrique), of the electrostatic condenser microphone and of apparatus for protecting radio receiving installations from disturbance by atmospheres. Address: Chef du Service, Radio téléphonique de l'Inde-chine, Hanoi, Tong-king.

Pession, Giuseppe.—B. 1881. Educated at the Royal Naval Academy whence was appointed midshipman in 1902. For two years Director of the Spezia Radiotelegraphic School and for three years teacher of radiotelegraphy at the Rome Military Institute of Radiotelegraphy. Since 1920 Professor of Radiotelegraphy and Naval Magnetism of the Naples Royal Superior Polytechnical School. Member of several commissions dealing with the development and reorganization of the radiotelegraphic services, both in Italy and abroad. To him is due the project and erection of many wireless installations established in Italy and Colonies. Since 1917 Chief of the Wireless Services to the Navy Department (Capt. R.N.) Has many national and foreign decorations. Author of many scientific works, including "Misura corrent nella pratica radio-telegrafica."

Petavel, Sir Joseph Ernest, K.B.E., D.Sc., F.R.S.—B. 1873. Educ. University College, London. Scientific Research at the Royal Institution and at the Davy Faraday Laboratory, 1896-98. John Harling Fellow, Owens College, Manchester.

1900-03. Scientific Manager, Low Temperature Exhibit of the British Royal Commission for the St. Louis Exhibition, 1904. Professor of Engineering and Director of the Whitworth Engineering Laboratories, University of Manchester, 1908-19. At present Director National Physical Laboratory, Teddington. Publications: Papers in the Philosophical Transactions of the Royal Society, "The Philosophical Magazine," "Engineering," etc. Member of Aeronautical Research Committee and other Government Committees connected with Aviation. Member of Committee on Imperial Wireless Scheme. Clubs: Athenæum; Royal Automobile, Primrose Club, London. Address: National Physical Laboratory, Teddington, Middlesex.

Petersen, Hermod.—B. Christiania, 1875. Graduated as electrical engineer at Bergen Technical College, afterwards attending the Polytechnic University at Karlsruhe, Baden. Chief of the Telegraph Schools, 1900-13. One of the pioneers of wireless telegraphic expansion in Norway. Superintended the first radio experiments, 1901. Later on formulated schemes for all wireless land stations along Norwegian coast. Member of the first International Conference on Wireless Telegraphy, Berlin, 1906. Engineer-in-Charge during the erection of a wireless station at Spitzbergen (1911), which communicates with a similar station in the North of Norway. Remained in charge during its first winter. Chief of the Norwegian Wireless Department, 1913. Superintends the land stations. Also Government Wireless Inspector, controlling all the ship stations of Norway. Published a number of technical books for instructional purposes, principally on the subject of telephony and telegraphy, both wired and wireless.

Petit, Gaston Emile.—Electrical Engineer in the French-Postes et Télégraphes; Technical Director of the Compagnie Générale de Radiotélégraphie. B. Paris, 1877. Chief of the Service of Wireless Telegraphy at the French Postes et Télégraphes, 1905-11. Member of the International Conference on Wireless Telegraphy, Berlin, 1906. Consulting Engineer, Cie Générale de T.S.F., and Société Française Radioélectrique. Address: 6, Rue Nansouty, Paris (xive).

Pickard, Greenleaf Whittier.—B. Portland, Me., February 14th, 1877. Educ. Westbrook Seminary, Lawrence Scientific School, Harvard, and Mass. Institute of Technology. Has made a special study of wireless telegraphy and telephony, and has taken out many United States and foreign patents for wireless inventions, among which are the crystal detector and radio compass. Began radio work 1899, at Blue Hill Observatory, Milton, Mass., under a grant from the Smithsonian Institution. Became associated with Harry Shoemaker, 1901. On the engineering staff of the American Telephone and Telegraph Company, 1902-06. Developed a practical system of radiotelephony, obtaining successful speech transmission without wires, 1902. From 1906 until the present date has been connected with the Wireless Specialty Apparatus Company as consulting engineer. Inventor of a method of reducing static interference, which was extensively used by the U.S. Navy for transatlantic reception during the war. Practices extensively as patent expert in wireless patent litigation, and is the author of many papers on radio communication. Fellow of the American Institute of Electrical Engineers. Member of the American Chemical Society. Member of the American Electrochemical Society. Member of the Society of Mechanical

Engineers. Member of the American Institute of Mining and Metallurgical Engineers. Member of the American Meteorological Society. Member of the Society of Chemical Industry. Past President and Fellow of the Institute of Radio Engineers. Club: Engineers'. Private address: Newton Centre, Mass. Office Address: 76, Atherton Street, Jamaica Plain, Mass.

Pletts, John St. Vincent.—B. Ryde, I. of W., 1880. Educ. locally and at Central Technical College. Joined Marconi's Wireless Telegraph Company, Ltd., 1899. Constructed wireless stations in Hawaii, Labrador, the Congo, Russia, and the Far East. Deputy Chief of Staff, 1906. Head of that Company's newly formed Patent Department, 1910. Expert in Cryptography at the War Office, 1914. Consulting Engineer, 1919. Member of various scientific societies, and author of a number of technical articles. Address: Marconi House, W.C.2, and Shalston House, Ewell Road, Surbiton.

Poulsen, Valdemar, Eng., D.Sc., D.Ph (n.c.) Leipzig (1909).—B. Copenhagen, November 23rd, 1869. Studied at University of Copenhagen, 1889-93. Entered technical department Copenhagen Telephone Company, 1893, and for a number of years superintended electrical testing operations. Holds Medal for Merit in gold with crown. Collaborated with Prof. P. O. Pedersen for many years. Member of the board of the Telegrafonen, Ltd. (Poulsen Patent), 1902-16. Joined board of Dansk Telegrafonfabrik, Ltd., 1909, and that of Poulsen Wireless Telephone and Telegraph Company, U.S.A. (1909-11). Fellow of Danish Society of Sciences (1914). Grand Prix at Paris in 1900 for telephone work. Invented in 1903 the arc method of generating continuous electrical waves of wireless frequencies. Danish Society of Sciences' Gold Medal (1907). Publications: "Une Méthode pour Produire des Oscillations non Amorties et leur Emploi dans la Télégraphie sans Fil"; and "La Téléphonie sans Fil"; Rapport Officiel au Congrès International des Applications Electriques, Turin, September, 1911 (Copenhagen, 1912). Address: Gentofte Maltøgardsvej 6, Copenhagen.

Prince, Major, Charles Edmond, O.B.E.—B. Capetown, 1874, son of Rev. E. B. Prince, sometime Vicar of Tor Mohun, Torquay. Educ. Clifton College (Science Exhibitioner) and Faraday House. Married in 1908 Amelia Ella Verner. Published 1905 "Ode on Poetry and other Poems" (Harrison, Pall Mall), etc. Joined Marconi's Wireless Telegraph Company, Ltd., 1907, specialised in Research Work and particularly in Wireless Telephony. Demonstrated first Marconi Field Station in Italy and Switzerland, 1909. Instituted important improvements in Bellini - Tosi Direction Finding System. Granted commission in Westmoreland and Cumberland Yeomanry, 1911. Attached R.F.C., April, 1915. Developed at Brooklands in same year first aircraft wireless telephone. Gazetted experimental officer (First Class), December, 1915. Mentioned in dispatches 1918, and in the same year appointed Major. Granted M.B.E. 1918, O.B.E. (Military Division), 1919. Technical Manager of the Aircraft Department, Marconi's Wireless Telegraph Company, Ltd. Addresses: Stubblings Manor, Burchetts Green, Berks.; 63, Drayton Gardens, London, S.W.

Pupin, Dr. Michael I.—B. Hungary, October 4th, 1858. Went to the United States, 1874. Studied at Colombia University. Graduated 1883. Study continued at Cambridge, England, and Berlin. Returned to the United States. Professor of Mathematical Physics at the

Colombia University, 1891. Among his first original work may be mentioned the development of electrical resonance, before the introduction of wireless telegraphy. Patents issued to him on electrical selectivity were licensed to Marconi's Wireless Telegraph Company, 1903. Director of Research Laboratory, Columbia University, New York, ex-President, Institute of Radio Engineers. Has worked extensively in the development of his inventions in connection with telephones and telegraphs, and many of his improvements are known by his name throughout the world. Has recently been engaged in the development of a new method of electrical selectivity to be used in connection with wireless telegraphy. Has also been engaged in research work in wireless telephony.

Raineri, Biscia Giuseppe.—Commander R. Navy. Educated at the Royal Naval Academy in Leghorn. In 1907, as instructor of radiotelephony took part in the first experiments on radiotelephony. Director of the wireless telegraph services in Eritrea (1911-13). Chief of Wireless Section at the Navy Dept (1916-17), co-operated in the development of c.w. on the Navy's wireless installations and on board merchant vessels. As a representative of the Italian Navy took part in several inter-allied conferences on ordinary and wireless telegraph communications in Central Europe. Member of the Preliminary International Wireless Telegraph Conference in Washington (1920), acting in the same capacity at the Provisional Technical Radiotelegraphic Committee held in Paris, 1921.

Rego, Capt. T. R. Moraes.—B. Rio de Janeiro, March 8th, 1882. Completed training at Naval Academy, 1900. Served for a few years on ships, studying electricity and torpedoes. Torpedo Lieutenant in the Professional Torpedo School. Began studying radiotelegraphy when first wireless stations were installed in Brazilian Navy, 1904. Perfected his knowledge of the subject on special trips to Europe and America. Assistant in the Radio Department of the Navy on various occasions. Appointed (1914) Chief of the Radio Service, Brazilian Navy, a post which he still holds. Address: 22, Ipanema Copacabana, Rio de Janeiro.

Rendahl, R. H.—B. 1878. Electrical engineer in the Royal Swedish Navy Department, 1909; attached to the Swedish Board of Admiralty, 1912: wireless expert attached to the Swedish Navy. Knight of the "Nordstjärna" Order, and holder of several foreign orders. Address: Djursholms, Osby, Sweden.

Reoch, Alexander.—B. Sheffield, England, 1884. Educ. Sheffield Science School and Sheffield University College. Graduated in electrical engineering, 1902, winning the Mappin Medal and Prize in that year. Entered the service of the English Marconi Company in June, 1902, and undertook construction and operating work in England, Holland, Germany, and Egypt. Appointed engineer with the Canadian Marconi Company, 1905, and from 1909 to 1911 in complete charge of the business, during which time that company's contract with the Canadian Government for the operation of the Great Lakes stations was negotiated, as well as the contract between the Canadian Company and the Newfoundland Government. Chief Engineer of the Canadian Marconi Company, 1917, and at the beginning of 1918 he relinquished this position to take an appointment on the engineering staff of the American Marconi Company. Appointed, 1920, Plant Engineer, Radio Corporation of America. Appointed January 1st, 1921, Assistant Chief Engi-

neer Radio Corporation of America. Fellow Institute Radio Engineers. Associate Member Engineering Institute of Canada. Member Franklin Institute of the State of Pennsylvania. Address: 233, Broadway, New York.

Ribeiro, Alvaro Nunes.—B. Lisbon, 1879. Educ. National Lyceum and the Lisbon Polytechnic School. Cadet in the Naval School, 1898. Completing his training there, was commissioned to join an expeditionary force to the Zambesi. On his return to Portugal he was appointed naval instructor at the Torpedo and Electrical School, where he devoted himself to the study of wireless. Leading member of the Naval Commission on Organisation, 1910, where he strongly advocated the establishment of a naval staff for war purposes. Member of Parliament. Member of the Commission on Posts and Telegraphs. Secretary to the Naval Commission. As a member of the Posts and Telegraphs Commission he fathered a Bill for the organisation of Portuguese Colonial Wireless which was passed by Parliament. Commanded the vessels "Berrio" and "Patrao Lopez" engaged in rescue work, when he met with a serious accident trying to save a cruiser. As a consequence returned to shore service, where he organised the Portuguese Coast Service, and formulated a code of regulations. Commander and Director, Radiotelegraphic Station of Monsanto. Address: R Vieira da Silva 64, Lisbon.

Rinde, K. Werner J., Junr.—B. Falun, 1882. Educ. Falun and Göteborg University. Telegraph clerk, controller, etc. Studied W/T and telephony systems and traffic, during voyages to Holland, Great Britain, Germany, Austria, Italy, and U.S.A. 1912-13, spending some months with the Marconi Companies in Rotterdam and at sea. Teacher at W/T school of Royal Swedish Telegraph Board from 1914. Supt. of the W/T station at Vaxholm, Sweden, 1914-16, of Karlsborg Radio since beginning of 1917. Address: Karlsborg, Sweden.

Rivers-Moore, H.R., B.Sc., A.C.C.I.—Educated at Wellington College and London University. Three years apprenticeship George Clark, Ltd., Engineers, Sunderland. Post Office Engineer-in-Chief's Dept., 1907. Delegate to 2nd International Telegraph Conference at Paris, 1910. Appointed to Wireless Section of the Post Office, December, 1910. In 1913 purchased and carried on the business of the Wilson Apparatus Co., manufacturing transformers, Wilson coils, and other Wireless apparatus. In 1916 this business was taken over by the Indo-European Telegraph Co., Ltd., and associated successively with Messrs. Creed & Co., Ltd., Croydon, and Automatic Telephone Co., Ltd., Liverpool. Appointed in 1918 Asst. Physicist at Admiralty Anti-Submarine Dept., Parkstone Quay, and subsequently given the rank of Hon. Capt. Marines. In 1920 organised the firm of "R. M. Radio Ltd.," undertaking the supply and maintenance of Wireless Equipments of all kinds and is Chairman of this Company.

Robinson, James, M.Sc. (Dunelm), Ph.D. (Göttingen).—B. 1884. Educ. University of Durham and University of Göttingen. Pemberton Fellow University of Durham, 1906-09. Lecturer in Physics, University of Durham, 1906-07. Lecturer in Mathematics, Armstrong College, 1909-10. Lecturer and Demonstrator in Physics, University of Sheffield, 1910-12. Lecturer in Physics, East London College, University of London, 1912-15. Examiner in Physics, University of London, 1912-15. Lieut.,

R.N.V.R. for Wireless Duties, 1915-17. Lieut., R.N.V.R., attached R.N.A.S. for Experimental Wireless Duties, 1917-18. Captain R.N.A.S. for similar duties, 1918-20. Chief Experimental Officer, Instrument Design Establishment, Biggin Hill, 1920-22. Head of Department for Wireless and Photography, Royal Aircraft Establishment, Farnborough, 1922. Author of "Dust Figures in Kundt's Tube" (papers in "Physikalische Zeitschrift," Philosophical Magazine, Proceedings of the Physical Society of London, between the years 1908 and 1913). "Absorption of Cathode Rays in Gases" (papers in "Annalen der Physik," Proceedings of the Philosophical Society of the University of Durham, in 1910). "Photoelectric Effect" (papers in the "Philosophical Magazine," 1910-15). Papers on "Directional Wireless and Reception on Aircraft" (in "Radio Review"). Article on Wireless, Dictionary of Physics. Various Patents. F.Inst. P. Fellow Physical Society of London. Member Royal Society of Great Britain. Address: R.A.F. Club, 128, Piccadilly, W.1., or Royal Aircraft Establishment, South Farnborough, Hants.

Robison, Samuel S., Rear-Admiral U.S. Navy.—B. May 10th, 1867. Graduated from the U.S. Naval Academy, 1888. In personal charge of the Division of Radiotelegraphy in the Bureau of Equipment, Navy Department, 1904-06, and in general charge from 1909-11. Author of the "Manual of Wireless Telegraphy for Naval Electricians" first issued in 1906, and revised for several subsequent editions. M.I.R.E. Address: Boston Navy Yard, Boston, U.S.A.

Rodrigues, Apolinio Gomes da Silva, Flag Captain in the Portuguese Navy.—B. May 31st, 1866. Finished education and entered Portuguese Navy in 1886. Became Professor of Electricity and Torpedoes at the Naval College in 1902, and Professor of Electricity of Naval Auxiliary College, 1903. Received his present rank of Flag Captain in 1907. Entrusted with embodiment of Naval Regulations concerning wireless in 1909. Elected Member of Advisory Committee on wireless in the Portuguese Navy in 1910. Address: Portuguese Admiralty, Lisbon.

Rutherford, Sir Ernest, Kt., F.R.S.—B. New Zealand, 1871. Educ. Nelson College, Canterbury College, New Zealand University, Cambridge University. Cavendish Professor of Experimental Physics, Cambridge, and Fellow of Trinity College. 1898-1907, Professor of Physics, McGill University, Montreal. 1907-1919, Professor of Physics, University of Manchester. Nobel Laureate, 1908. Has published many works dealing with the conduction of electricity through gases and radio activity. Address: Lewisham Cottage, Cambridge.

Rydin, Sven Ludvig Hermon.—B. Upsala, October 2nd, 1861. Graduated in Law, Upsala, 1885, solicitor's clerk 1887, Registrar in the Lower House 1888-90, Registrar in the Upper House 1890-97. Auditor attached to the Swedish State Railways 1890-97, Registrar attached to the Board of the State Railways 1895-96, assistant to the Director of the State Railways 1896-97, Member of the Board of Telegraphs 1897-1902, Under Secretary of State for Home Affairs 1902. Since 1905 Director of Telegraphs in Sweden. Grand Commander of the "Nordstjärna" Order and holder of several foreign decorations. Address: Kungl. Telegrafstyrelsen, Stockholm.

Salmond, Captain J. S. C., R.N.—B. 1882. Entered "Britannia," 1897, left 1898. Served

in China in "Barfleur," landed in the Boxer operations, 1900. Mentioned in dispatches. Served in Pacific in "Grafton" and "Flora." Qualified as torpedo lieutenant, 1905. Served in Atlantic in "Antrim" as lieutenant (T.). Served in Wireless Telegraphy Experimental Department, "Vernon," 1908-11. Squadron Wireless Telegraphy Officer, 2nd Battle Squadron in "Hercules," 1911. Fleet Wireless Telegraphy Officer, Home Fleet (later Grand Fleet), in "Neptune" and "Iron Duke," 1912-15. Wireless Telegraphy Assistant to D.N.O. Admiralty, 1915-17. In command of "Odin" in Red Sea, 1917-19, mentioned in dispatches for operations against Turkish forces in the Asir and Yemen. Serving in Signal Division, Admiralty, on Wireless Telegraphy duties. Member of Radio Research Board. Address: Admiralty, London, S.W.1.

Saltmann, Charles McKinley, Brigadier-General—B. 1871, State of Iowa. Started business as railway telegraphist and graduated at West Point, 1896. As cavalry officer took part in the Spanish-American War, 1898. Signal officer during the Insurrection in the Philippine Islands. Transferred to the Signal Corps of the U.S. Army, 1901. Since identified with the electrical cable and radio work, U.S. Army. For a number of years in charge of the electrical Laboratory of the Signal Corps in Washington, where radio equipment of the U.S. Army is designed and tested. In charge of the radio work of the U.S. army on the Panama Canal. Represented the United States at the International Radiotelegraphic Conference of London, 1912. Member of the Inter-Departmental Board which prepared regulations for the control of radiotelegraphy in the U.S.A. Executive officer in the Chief Signalling Office. Address: Office of the Chief Signal Officer, Signal Corps, U.S.A., Washington, D.C.

Sankey, Captain M. P. H. Riall, C.B., C.B.E., R.E. (Ret.)—B. Nenagh, Ireland, 1853. Educ. Switzerland, Royal Military Academy, Woolwich, School of Military Engineering, Chatham. Served in England, at Gibraltar, and as Instructor in Fortification at the Royal Military College, Kingston, Canada. Posted to the British Ordnance Survey, and had charge of the Trigonometrical Division the Electrotyping Department and the Workshops. Retired from the service (1889) to join the Board of Messrs. Willans and Robinson, Ltd., and (1904) took up consulting work. Shortly afterwards joined the Boards of Marconi's Wireless Telegraph Company, Limited, and the Marconi International Marine Communication Company, Limited. Also a Director of several other companies. Served during war as Hon. Engineering Adviser to the Director of Fortifications and Works. Served on the Hon. Valuation Advisory Committee of Experts, dealing with the plant and buildings installed by manufacturing firms for munition purposes. Author of "The Energy Chart," "Practical Application to Reciprocating Steam Engines," part IV of Rimington's "Construction" (anonymously). Translated from German Prof. Ritter's book on "Bridges and Roofs." Contributed numerous papers to I.C.E., I.M.E., I.E.E., Inst. Naval Architects, Royal Society of Arts, Royal Society, etc. etc. Member of the following institutions: Civil Engineers, Mechanical Engineers (President 1920 and 1921), American Mechanical Engineers, Electrical Engineers, Royal Institution of Great Britain, Iron and Steel, Naval Architects, Junior Engineers, and Gas Engineers. Member of the Governing Board of the National Physical Laboratory and of the Wireless Telegraphy

and Gaseous Explosives Committees of the British Association. Address: 57, Castle Bar Road, Ealing, W.3.

Sarnoff, David.—B. in Russia, February, 1891. Entered the United States July, 1900. Started business 1906, and in 1907 received an appointment as Wireless Operator at the Marconi Station located at Siasconset, Nantucket Island, Mass. Served at various ship and shore stations, and eventually became Manager at the Marconi Station at Sea Gate. Has held a number of responsible positions in the service of the Marconi Wireless Telegraph Company of America, being now Commercial Manager of the Radio Corporation of America. Vice-President and Director of the Pan-American Wireless Telegraph and Telephone Company. Secretary of the Institute of Radio Engineers 1915-1917. Author of a paper on Radio Traffic read before the Institute of Radio Engineers, and a number of other papers on wireless telegraphy. Addresses 90, Pinehurst Avenue, and 233, Broadway, New York.

Sayeki, Mitsuru.—B. Japan, 1871. Entered Naval College, 1889. Entered the Electric Technical Laboratory of the Ministry of Communications, 1895. Engaged since 1899 in the investigation of radiotelegraphy. Was connected with "Teishinsho" Radio System, Government and private commercial coast station and commercial ship stations in Japan. Since 1908 Chief Radio Engineer of the Director-General of Japanese Posts and Telegraphs. Awarded prizes and medals for investigation in radio telegraphy. Fellow I.R.E. (Amer.). Address: 23, Kasumicho, Azabu, Tokyo.

Schledermann, Helmuth Joh. Christian.—B. Copenhagen, September 24th, 1876. Educ. Royal Naval Engineering College; Polytechnic Academy of Copenhagen. Further training with electrical firms in foreign countries. Controls the Electrical and Wireless services of the Danish Navy, also Inspector of Danish W/T stations and Electrical and W/T adviser to the Danish Lighthouse Department. Member of the Danish Engineer's Assn., "the International Electro-technical Commission and a Commission dealing with erection of a high-power wireless station in Denmark. Publication: A manual on W/T for the Danish Royal Navy. Knight Dannebrog, Knight Norwegian St. Olav. Address: Taffelbays Alle 11, Hellerup, Denmark.

Schwill, Fr.—B. Strasburg (in Alsace), April 21st, 1875. Started career as member of the German Post and Telegraph Service. Took part in the International Radiotelegraphic Conference at Berlin in 1906. Appointed by the Swiss Federal Government to the International Bureau of the Telegraphic Union to organise and supervise the new Radiotelegraphic section established by the Berlin Conference. Present position, Sub-Director of the International Bureau of the Telegraphic Union at Berne. Address: Bureau International de L'Union Télégraphique, Berne.

Scott-Taggart, John.—Educ. Technical establishments and King's College, London. Two years departmental Manager and Research Engineer, Radio Communication Co., Ltd. Acts as patent adviser to C. F. Elwell, Ltd., and Mullard Radio Valve Co., Ltd., and in a technical advisory capacity to other concerns. Sometime in charge of valve design and construction at Ediswan Lamp Works. Served 1914-1919; sometime Instructor of Wireless to 1st Army, but chiefly Wireless Officer to various units. Mentioned in Dispatches and later awarded

Military Cross. Author of various papers before British Association and other Societies, and of over fifty articles; also the volume "Thermionic Tubes in Radiotelegraphy and Telephony." Fellow of the Institute of Physics and holds membership in the Physical Society and the British, American, and French Institutions of Electrical Engineers; also President of two wireless societies and committee member of Radio Society of Great Britain. Has produced several inventions of commercial importance, particularly in connection with Thermionic Valves. Address: 6, Beattyville Gardens, Ilford.

Shaughnessy, Edward, H., O.B.E.—B. 1871. Engineer-in-charge wireless section, Engineering Department, British Post Office. Entered Post Office Engineering Department, 1896, served in experimental, testing, telegraph, and cable sections, specialising on underground and submarine cables. Served as a cable engineer (1895) on s.s. "Paraday," during the laying of a submarine cable in Gulf of Mexico, and the repair of other cables. After five years in the provinces on construction and maintenance work returned to London (1913) to take up present position. For many years lectured on telegraphy, telephony, etc., at various London Technical Institutes. Member of the Radio Research Board. Post Office representative on Committee of Wireless Section, Institution of Electrical Engineers. Vice-President, Radio Society of Great Britain. Examiner in Telegraphy for the City and Guilds of London Institute. Member of some committees and panels of the British Engineering Standards Association. Address: Engineering Department, General Post Office, London.

Shoenberg, I.—B. 1881. Graduated at the Polytechnic Institute of Kieff. In 1905 joined the Russian Marconi Company on the day of its inauguration, being appointed Chief Engineer. Held this post until 1914, when he left Russia for England, joining Marconi's Wireless Telegraph Company in the capacity of Consulting Engineer. Since 1919 engaged as Chief of Patent Department. Address: Marconi House, Strand, W.C.2.

Simpson, Lt.-Col. Adrian C.M.G. (late) R. E.—B. Edinburgh, 1880. Educ. Clifton and the Royal Military College, Sandhurst. Commissioned in His Majesty's Forces, 1900. Served in India, being transferred to the Regular Indian Army. Visited Russia 1903-5 for linguistic study. Retired 1907. Becoming interested in wireless telegraphy, and started work with the English De Forest Wireless Telegraph Syndicate. His connection with Marconi's Wireless Telegraph Company commenced with his joining the Field Station Department. On the formation of the Russian Company of Wireless Telegraphs and Telephones, 1908, appointed managing director of that company. During the war served in Russia; and at the War Office. Late Director of Wireless Telegraphy under the Government of India. Deputy Managing Director of Marconi's Wireless Telegraph Co. Chevalier of Order of St. Anne, 3rd Degree, and of Order of S. Stanislas, 2nd Degree, with Crossed Swords. Addresses: c/o H. S. King & Co., 9 Pall Mall, S.W., The Naval and Military Club, and Ranelagh.

Sins, Ernest.—B. 1859, Besançon, where he received his early education. Joined the Ecole Polytechnique, and began his career by enrolling in the Corps of Telegraph Engineers. Participated in the organisation of the telegraphic and telephonic systems in Tunisia. Received an appointment in the Central Office of Posts and

Telegraphs, Paris, 1892, where he ultimately rose to the position of Telegraph Engineer-in-Chief. Chief of the Correspondence Department of International Telegraphy, 1899, and took special interest in wireless telegraphy. Represented his country at the International Conferences on Radiotelegraphy held at Berlin, 1903, and acted as Secretary to the Commission appointed by the latter Conference for drawing up regulations. Sub-Director of the French Telegraphic Department, 1911, but resigned from "the public service in the same year in order to be at liberty to take part in the development of wireless industry. One of the founders and directors of the Compagnie Générale Radiotélégraphique, and was afterwards managing director to the Compagnie Universelle de Télégraphie et de Téléphonie sans Fil. Since the beginning of 1918, general manager of the Compagnie Générale de Télégraphie sans Fil.

Slee, Commander J. A., C.B.E., R.N. (Ret.)—B. May, 1878, Wimbledon. Educ. on training ship "Britannia." First appointment, as midshipman was to H.M.S. "Centurion," on which vessel he sailed for China, 1894, being transferred, three years later, to the brig "Nautilus" for sailing experience. Passed for his lieutenant's commission, obtaining four firsts out of a possible five. After service on the "Decoy," "Ernest," "Anson," and "Severn," qualified as Torpedo Lieutenant, and spent a year on the staff of the "Defiance" at Devonport, where he gained his first wireless experience, 1901. Whilst attached to H.M.S. "Queen," 1906, eyesight trouble developed and he was obliged to transfer to shore service. For two years after quitting the sea he served as one of the Wireless Telegraph Experimental Officers on the "Vernon" at Portsmouth, and from 1908 until 1919 was in charge of all shore wireless and war signal stations in Great Britain. Promoted Acting Commander, 1913. Acting Captain, 1918. On the formation of the Wireless Board, Captain Slee was appointed its chief. Awarded an O.B.E., January, 1919. C.B.E., April, 1919. Retired from the Navy due to the eyesight trouble mentioned above, December 1st, 1919, with the rank of Commander. Joined the Marconi International Marine Communication Co. as Technical Superintendent and Adviser, January 1st, 1920. Appointed Technical Manager, M.I.M.C. Co., Ltd., June, 1921. Address: 7, Elvaston Place, London.

Smith-Rose, Reginald Leslie, M.Sc.—B. 1894. Educ. Imperial College of Science and Technology: (a) Royal College of Science, 1912-14; (b) City and Guilds (Engineering) College, 1912-15. Diplomas: Master of Science, London, for Research in Radiotelegraphy; Bachelor of Science, London, First-class Honours; Royal Scholar, Physics, First Place; Associate of Royal College of Science (A.R.C.S.), Class 1, Physics Prizeman. Diplômée of the Imperial College (D.I.C.) for Research Work in Wireless Telegraphy at the City and Guilds (Engineering) College. Practical experience with Messrs. Siemens Bros., Woolwich, from 1915-19, engaged on experimental work in connection with Military, Manual and Automatic Telephones; and latterly with Thermionic Valve Amplifiers for Telephone Lines and Wireless Receiving sets. Now an Assistant at the National Physical Laboratory, engaged on general Radio Research. Member of Sub-Committee "C" on Directional Wireless, of the Radio Research Board of the Department of Scientific and Industrial Research. Physicist-in-Charge of Directional Wireless Research under Sub-Committee "C" of the Radio Research Board. Past Senior Lecturer in

Wireless Telegraphy and Telephony at the Polytechnic, Regent Street, W. Member of Committee of Wireless Section of the Institution of Electrical Engineers. Fellow of Physical Society of London. Member of Radio Society of Great Britain. Author of various scientific papers before I.E.E. and Physical Society, and in "Beama Journal." Address: National Physical Laboratory, Teddington.

Smith, Tom Vincent, Major, M.C.—B. 1872, West Dulwich, London. Joined the Amalgamated Radio Telegraph Company in 1906. Director of the British Radio Telegraph Company. Consulting engineer until outbreak of War. Served on the Civil Aerial Transport Committee, and the Wireless Committee of the Institution of Electrical Engineers. President of the National Association of Supervising Electricians. Papers before the Royal Artillery Institution at Woolwich on "The Co-operation of Aeroplanes with Artillery," and before the British Association on "Aircraft Wireless during War." War Services: Joined No. 1 Reserve Air Squadron at Farnborough, January, 1915. No. 7 Squadron in France, February, 1915. Wireless Officer to No. 3 Squadron in March, and to the 1st Wing in May, 1915. R.F.C. General Headquarters in March, 1916, in charge of R.F.C. Wireless on the Western Front. 1917, Officer-in-Charge of Wireless at the Air Ministry for all theatres of War, 1918, Wireless Officer to the Independent Air Forces until end of War. Decorations: Military Cross, Knight of the Military Order of Savoy, 1914-15 Star, General Service Medal, Victory Medal with oak leaves, King Edward's Coronation Medal, twice mentioned in despatches. Address: Royal Thames Yacht Club, 80, Piccadilly, W. 1.

Snell, Sir John Francis Cleverton, Kt. (Cr. 1914.) B. Saltash, Cornwall, 1869. Educ. Plymouth Grammar School, and King's College, London, 1883. With Messrs. Woodhouse & Rawson, and with Messrs. Crompton & Co., at the Kensington Court and Notting Hill Power Stations, and at Stockholm (Sweden). 1892, Assistant and afterwards Chief Assistant to the late Major-General Webber, C.B., R.E., Consulting Engineer. 1893, Under the late Professor Henry Robinson, as Resident Engineer at King's Road Station, St. Pancras 1896, Borough Electrical and Tramways Engineer, Sunderland. 1906, in private practice as a Consulting Engineer at Westminster 1910, Amalgamated with and became partner of Messrs. Preece, Cardew, Snell and Rider, Consulting Engineers, and during that time acted as principal technical witness for the Crown in the National Telephone Arbitration. 1919, Relinquished partnership and accepted position of Electrical Adviser to the Board of Trade and Chief Electricity Commissioner-designate. 1920, Appointed Chairman of the Electricity Commission. Hon. Commandant of the Engineering Institutions' Volunteer Engineer Corps. One of the original five Trustees appointed by the Army Council to form the Metropolitan Munitions Board. Member of the Nitrogen Products Committee (Ministry of Munitions), and Chairman of the Power Sub-Committee, and member of several other Sub-Committees. Member of the Electrical Trades Committee (Board of Trade). Member of the Electrical Power Supply Committee, (Board of Trade). Chairman of the Water Power Resources Committee (Board of Trade). Chairman of the Electro-Culture Committee (Ministry of Agriculture), and a member of several other Committees. Member of the Advisory Council for Scientific and Industrial

Research. Member of the Imperial Wireless Telegraphy Committee. Member of the Electrification of Railways Advisory Committee. Past Pres. I.E.E. Member of Council I.C.E. Past Pres. Inc. Municipal Elect. Assn. Member Main Committee and Past Chairman of Sectional Elect. Committee of Brit. Eng. Standards Assn. Fellow I.E.E. (Amer.). Fellow Geog. Soc., etc. Contributed: "Distribution of Electrical Energy," 1906 (Spon); "Power House Design," Second Edition, 1921 (Longmans); and many papers read before several Engineering Institutions. Addresses: "Southernway," by St. Martha's, Guildford, Electricity Commission, Gwydyr House, Whitehall, S.W., Junior Carlton, St. Stephens and Royal Fowey Yacht Clubs.

Solari, Marquis Luigi.—Cavaliere Ufficiale della Corona d'Italia, Cavaliere dei SS. Maurizio e Lazzaro, Commendatore di Danilo, and Cavaliere of St. Anna. Received decorations of bronze medals for the campaigns of China and Africa. —B. in Turin. Was appointed officer of the Italian Royal Navy in 1890. Obtained the diploma of Electrical Engineer at the University of Turin in 1898. In 1900 placed in charge of the Laboratory of Wireless Telegraphy at the Royal Dockyard of Spezia. In 1902 took charge of the wireless telegraph station on the Italian warship "Carlo Alberto" during the historic experiments on that vessel conducted by Senator Marconi. In 1903 delegate of the Italian Government to the Berlin Wireless Conference. In 1904-05 supervised the Wireless Telegraph Department of the Italian Ministry of Posts and Telegraphs. Official delegate of the Italian Government at the International Congress of Electricity held at St. Louis, U.S.A., in 1904. Joint inventor with Professor Lori, of the Padua University, of a magnetic relay. Has published several papers on wireless telegraphy in various periodicals and reviews. Since 1906 has devoted himself to the development of the Marconi system in several countries. Address: Via Maria Adelaide, 8, Rome (Italy).

Squier, Major-General Sir George Owen, K.C.M.G., Ph.D.—Educ. Johns Hopkins University, Baltimore. Grad. Doctor of Physics 1893. Research student under the late Professor Rowland and in the laboratory of the late Sir William Preece at the British General Post Office. Discovered the use of living trees as a means of receiving wireless messages 1904, and published a paper entitled "The Absorption of Electro-Magnetic Waves by Living Vegetable Organisms." On June 28th, 1911, a paper by him, dealing with multiplex telephony and telegraphy by means of waves guided by wires was read before the American Institute of Electrical Engineers. Author of numerous papers on the subject of wireless telegraphy and has devoted special attention to the use of wireless telegraphy in military operations. In 1896 the City of Philadelphia, acting on recommendation of the Franklin Institute, awarded him the John Scott Legacy Medal and premium for the polarising photo-chronograph. Awarded the Elliott Cresson Gold Medal for his researches in multiplex telephony, 1912. Presented a paper on "Cable Telegraphy" to the Physical Society of London, June 1915. Author of "Tree Telephony and Telegraphy," "Multiplex Telephony and Telegraphy over Open-circuit Bare Wires Laid in the Earth or Sea," etc. Member of National Academy of Sciences, 1919. Awarded the Franklin Medal, by the Franklin Institute of Philadelphia, Pa., 1919. Awarded the Distinguished Service Medal, United States Army, 1919. In 1919

decorated with the insignia of the Order of Knight Commander of St. Michael and St. George, by Field Marshal Sir Douglas Haig. In 1922 awarded the Italian decoration, Commander of Order of the Crown, Chief Signal Officer U.S. Army. Formerly Military Attaché to the American Embassy in London. Representative of War and State Departments, at the Conference of Interallied Radio Technical Committee, at Paris, France, June-September, 1921. Designated Expert Assistant to American Commissioners representing United States Government at Conference on Limitation of Armament, Washington, 1921. Appointed an ex-officio member representing War Department, of the United States National Committee, International Electrotechnical Commission. Address: War Department, Washington, D.C., U.S.A.

Stanley, Rupert, Principal Municipal College of Technology, Belfast.—B. in Ireland, 1876. Educ. Irish schools and universities. Joined technical staff of the Isle of Thanet Electrical Light and Power Company in 1899, and two years later appointed Lecturer in Physics and Electrical Engineering at the Brighton School of Science and Technology. Returned to Belfast in 1903 as Professor of Physics and Electricity at Belfast Municipal Institute. Principal Municipal College of Technology, Belfast, Professor of Electrotechnics in Queen's University, of Belfast. M.I.E.E. Chevalier of the Legion of Honour. In 1914 undertook the preparation of a "Text-book of Wireless Telegraphy," which has become a standard text-book on the subject, both at home and in America, and is now published in two volumes, of which the second deals exclusively with valves and valve apparatus. Started war service as second in command of a Field Company in the Ulster Division, but was soon transferred to radio-telegraph work, and served in France from October, 1915, to April, 1918, where he became Chief Wireless Instructor to the B.E.F. Address: Municipal College of Technology, Belfast, and The Ulster Club Belfast.

Stone Stone, John.—Studied electricity, chemistry, physics and mathematics at Columbia University and Johns Hopkins University. Experimentalist in research laboratory, American Bell Telephone Company, 1890-99. Made some investigations in telephony without wires. 1892. Consulting Electrical Engineer and expert for the Ladd Wireless Telephone Syndicate, experimenting on directional signalling, 1899. Retained in 1900 by the Stone Wireless Telephone Syndicate, and in 1902 when the Stone Telegraph and Telephone Company was organised. Author of many scientific papers on wireless. Granted more than 100 U.S. patents in the radio field and a correspondingly large number of foreign patents. Fellow American Academy of Arts and Sciences. Fellow American Association for the Advancement of Science, Fellow and Past-President Institute of Radio Engineers. Member or Associate of the following Societies: American Institute of Electrical Engineers; American Electro-Chemical Society; U.S. Navy Institute; Franklin Institute; Mathematics and Physics Club; Boston Scientific Society. His investigations have been principally directed along the lines of eliminating interference in wireless telegraphy.

Swinburne, James, F.R.S.—B. Inverness, February 28th, 1838. Educ. Clifton College. Employed by Messrs. J. W. Swan & Co. (1887) to organise their lamp factory in Paris; later he went on a similar mission to America.

Consulting Engineer since 1894. Member of the Technical Committees considering the Imperial Wireless Scheme, 1912 and 1919-20. Member of various scientific societies, and is on the Council of some. President of the Institution of Electrical Engineers, 1902-3. Addresses: 82, Victoria Street, S.W.1; Woodhurst, Oxted, Surrey.

Swinton, Alan A. Campbell, F.R.S.,—B. Scotland, 1863. Opened career in 1882 at the Armstrong Works, Elswick. Consulting electrical engineer in London since 1887, having been responsible for the carrying out of many large electrical installations. Chairman of Crompton & Co., Ltd., and director of several electricity supply and engineering manufacturing companies. Associated with the development of the Parsons turbine and other important inventions. Chairman of the Council of the Royal Society of Arts; Chairman of the British Scientific Instruments Research Association; a Member of the Executive Committee of the Board of the National Physical Laboratory; Past President of the Röntgen Society. Member of the Executive Committee of British Science Guild; a Manager of the R. Institution of Great Britain (1912-15). Member of Subcommittee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Past President of the Radio Society of Great Britain. Has devoted considerable attention to scientific research, including wireless telegraphy. Address: 66, Victoria Street, Westminster, S.W.1.

Tafur, D. Jose, Col., Spanish Royal Engineers, Director of the Centro Electrotécnico y de Comunicaciones, Madrid. Has the full control of the Wireless Services in the Spanish Army. A member of the Spanish permanent Radio-telegraph Commission. One of the chief contributors of military as well as civil wireless in Spain.

Tesla, Nikola.—B. Smiljan, Sika, Dalmatia, 1857. Graduated Carlstat, 1873. Went to Gratz, where, at the Polytechnic School, he prepared for work as professor in mathematics and physics. Visited America about 1882, where he captured the attention of the whole world with his fascinating experiments on high-frequency electric currents. Since 1890 devoted himself almost entirely to studies of alternating currents of high frequency and very high potentials.

Thornblad, Thor, Lieut.—B. Upsala, Sweden. 1885. His interest in the theory and practice of wireless dates from 1899. Author of the first Swedish standard work on wireless telegraphy, "Trådlösa Telegrafi" (932 pages), published by P. A. Norstedt & Soeners Förlag, Stockholm, 1911. Passed examination as student at the High School of Stockholm, 1904. Entered the Royal Engineers as cadet, 1904. Commissioned 1906. Studied mathematics, physics and chemistry, 1906-10, first at The Royal Technological Academy of Stockholm, later at the University of Stockholm. By command of the Swedish government, studied wireless telegraphy in foreign countries. Author of a number of articles on radio-telegraphy in the scientific and daily press. Member of the Royal Military Association of Stockholm, the Society the Friends of the Swedish National Museum, the Royal Swedish Yacht Club, etc. Knight of the Order of the Crown of Italy. Address: Strandvägen 7, Stockholm.

Thomson, Sir Joseph John, Kt., O.M., D.Sc. Oxon. (hon.), Dublin, Victoria and Columbia (N.Y.), F.R.S., etc.—B. near Manchester, 1856. Educ. Owen's College; Trinity College, Cambridge. Master of Trinity College, Cambridge, since 1918; Cavendish Professor of Physics, Cambridge, 1884-1918. Has published numerous works, including "Recent Researches in Electricity and Magnetism," 1895; "Discharge of Electricity through Gases," 1897; "Conduction of Electricity through Gases," 1903. Address: Trinity College, Cambridge.

Todd, David Wooster, Captain U.S. Navy.—B. Round Valley, California, June 29th, 1874. Educ. private and public schools in Mich., Nev., and San Francisco. Appointed to Naval Academy, 1891, graduated in June, 1895. Has served at sea on the following vessels of the United States Navy: "Constellation," "Monongahela," "Olympia," "Oregon," "Wheeling," "Rainbow," "Chicago," "Iowa," "Newark," "Denver," "Monterey," "Concord," "Galveston," "Wyoming," "Dixie," and in command of the "Pittsburgh," flagship in European waters; has served ashore as instructor in ordnance, Naval Academy; in charge of Radio Division of Bureau of Steam Engineering, Navy Department, and as Assistant Superintendent of the Radio Service. Attended International Radiotelegraphic Conference, London, 1912, as a delegate. Director Naval Communications, August 3rd, 1916, succeeding Capt. (now Rear-Admiral) W. H. G. Bullard, U.S. Navy. Attended Inter-Allied Radio Conference in Paris upon United States entry into European War, and subsequently organised the American end of the Inter-Allied Transatlantic Radio System. Also organised and directed the United States Cable Censorship, and served on the Censorship Board as Chief Cable Censor. At present Aide to the Commandant, Navy Yard, New York. Address: Navy Yard, New York.

Torikata, Dr. Wichi.—B. Japan, 1883. Trained in Electrical Engineering at the Engineering College of Tokyo Imperial University. Graduated 1906. Devoted himself to the study of Radiotelegraphy and Telephony, acting at one time as Assistant Engineer to Dr. Osuke Asano, ex-Director of the Electro-Technical Laboratory, and also as Chief Engineer of the wireless section. Inventor and patentee of the Koseki or Mineral Detectors, the T.Y.K. Oscillation Gap for use in Radiotelephony, and the Wave Telephony superposed on electric power transmission line. The late Mikado of Japan recognised his services by awarding the Fifth Degree of Decoration, bestowing this honour specifically for services in connection with Wireless Detectors, whilst the Ruling Emperor has presented him with the Fourth Degree of Decoration on account of Radio Researches. The Senate of Tokyo University marked their appreciation by bestowing upon him in 1915 the title of "Dr. Engineer." Has received many prizes for technical work, including the First Medal of the Japanese Electric Engineers' Society (established 1888), and Academy Prize and Medal granted by the Japanese Imperial Academy. After the resignation of Dr. M. Tonegawa, ex-Director, became Director of Electro-Technical Laboratory, Japanese Department of Communications. Address: No. 2801 Sanno, Omori, near Tokyo.

Tosi, Alexandre.—B. 1867. Awarded diploma by the Italian Navy for his electrotechnical works applied to naval science (1889). Together with Dr. E. Bellini, from 1906 to 1911, devoted himself to studying and experimenting upon the

directivity of aerials insulated from earth. In the beginning of 1907 in co-operation with Dr. E. Bellini produced the radiogoniometer which avoids the material rotation of the aerial for directional communications. Together with Dr. E. Bellini was awarded the gold medal by the Italian and Belgian Government for his invention; the same award was obtained at the Brescia Electrical National Fair in 1909, at the Bruxelles International Fair in 1910, and at the Turin National Exhibition in 1911, where the direction apparatus was shown.

Travaillleur, Maurice.—B. Brussels, 1871. Graduated as engineer at Brussels University, 1893. Appointed Electrical Engineer to the late King of the Belgians, 1897. One of the founders of Internationale Société Anonyme, the Marconi International Marine Communication Co., Ltd. Managing Director of the Société Anonyme Internationale de Télégraphie sans Fil, and Chairman of the Société Nationale Radio-électrique, both in Brussels.

Tsiang Tseng-yi.—Native of the Haining District of the Chekiang Province. Acquired the third degree of Literature at the Metropolitan Examination in Peking, 1904, and appointed Junior Clerk of the Board of Revenues. Soon afterwards transferred to the Board of Communications (then known as Yuchuanpu). Proposed that all the commercially and provincially owned telegraph lines be nationalised and placed under the direct control of the Yuchuanpu. This proposal received the approval of the Government, and was put into operation. In 1911, as Commissioner of Telegraphs of the Yuchuanpu, he caused two powerful radio stations to be established, one in Peking and the other at Nankin. He served over ten years in the telegraph service, holding the following positions: 1910-11, Commissioner of Telegraphs of the Yuchuanpu; 1913-16, Chief of the Financial Department of Telegraphs, Posts and Navigation. Acted as Chief of the Telegraph Department and Director-General of Telegraphs of the Ministry of Communications, and Chairman of the Chinese Society of Electrical science.

Turner, Laurence Beddome, M.A.—B. 1886. Educ. Bedford Grammar School and King's College, Cambridge (1904). First class honours in Mechanical Sciences Tripos in 1907. Spent 1907-08 in research work at the C.U. Engineering Laboratory, receiving in 1908 the award of the University "John Winbolt Prize" for an essay on this research. After a year in the workshops and drawing office of Messrs. Siemens Bros. at Woolwich and Siemens u. Halske A.G. at Berlin, entered in 1910 the Engineer-in-Chief's office of the G.P.O. Engaged there in W/T experimental work, and in the design and installation of new ship-and-shore stations. Attached to the Army Signals Experimental Establishment at Woolwich 1916, where he designed wireless field apparatus, including the Infantry "Loop Set." Fellow and Lecturer of King's College, Cambridge, 1919. Member of the Imperial Wireless Telegraphy Committee, 1919. Author of "Outline of Wireless," 1921. Address: King's College, Cambridge.

Turner, Samuel.—Educ. Barrow-in-Furness Sec. and Tech. Coll., under G. Grace, D.Sc., etc. Two years' works training at Messrs. Vickers, Maxim, Barrow. Appointed to post in Telephone Research Labs., London. Subjects included Telephony and Telegraphy, Valves and Valve Circuits, Telephone Transmission,

High-Frequency Measurements, Automatic Telephony, etc. Lecturer and Instructor to R.F.C. W/T Officers at Brooklands (under Major Prince) in W/Telegraphy and Telephony applied to Aircraft December, 1915–Oct., 1917. Research work in W/Telephony C.W., etc. (using Triodes) at R.F.C. W/T Exper. Station, Biggin Hill and Woolwich (1917-18). Transferred to Air Ministry to develop and supervise Technical Section. Resumed civilian research work July, 1919. Inventions: Devices for W/Target Training of Pilots, Observers, etc. Publications: Papers (London Telephone Society). Articles: "Electrician" (and other papers), and I.C.S.; "Textbook on Automatic Telephony, etc. Address: Gothic Cottage, Littlewick, Berks.

Turpain, Professor Albert.—B. La Rochelle, December 2nd, 1867. Employed in the Department of Posts and Telegraphs of France, 1884-87. Licentiate in physical science, 1888. Licentiate in mathematics, 1891. Obtained doctorate of science, 1889. While tutor of physics at the Faculty of Science, Bordeaux, succeeded in sending messages without wires from an equipment erected in the college buildings. Applied himself to the question of tuning and (1899) experimented with a means for determining the direction of electro-magnetic waves. Resumed these experiments 1912. Succeeded in obtaining graphic records of time signals by means of a micro-ammeter over a distance of 300 km. between Poitiers and Paris, 1911. Carried out successful experiments in photographically recording wireless telegraph signals which passed between Paris and Poitiers.

Vallauri, Giancarlo.—B. Rome, 1882. Educ. in the classical schools of Italy. Entered the Royal Naval Academy. Appointed officer of the Royal Italian Navy, 1903. After a few years at sea he quitted the active naval service and joined the Polytechnic School in Naples, obtaining the diploma of engineer and the electro-technic diploma, 1907. Since conducted electrical tuition in the Polytechnic Schools of Padua, Karlsruhe and Naples. Connected with many industrial electric establishments. Inaugurated at the Polytechnic School in Naples a course in Wireless Telegraphy, 1912, and supervised that subject till the end of 1916, with an interruption for service at sea during the first two years of the great war, when he was called to the direction of the Institute of Electricity and Wireless Telegraphy of the Royal Navy by the Royal Naval Academy in Leghorn. Is now also Professor of Electro-technics at the University of Pisa and engaged in supervising the great new station of Coltano-centre. His attention has mainly been turned to the study of ferro-magnetic phenomena, to which he has made important contributions. Has published a series of papers on Ionic Valves, and on radiation measurements. Address: R. Accademia Navale, Leghorn, Italy.

Van der Bijl, Dr. H. J.—B. Pretoria, 1887. Educ. Victoria College, South Africa and Universities of Halle and Leipzig, where he gained his doctorate. Visited the United States in 1913, and joined the Engineering Department of the American Telephone and Telegraph Co. and Western Electric Co. Appointed Scientific and Technical Adviser to the Government of the Union of South Africa, 1920. M.I.R.E., I.E.E. (Amer.), P.S. (Amer.). Among his inventions is the modulation system used successfully by the American Telephone and Telegraph Company in 1915 for wireless telephone communication over a distance of 5,000 miles. Figured prominently in the development of the Thermionic Vacuum Tube, and ranks among the

leading authorities on thermionics. Author of "The Thermionic Vacuum Tube and its Applications," and numerous publications in scientific and technical journals on the vacuum tube and the passage of electricity through ionized liquids, gases, and in high vacuum. Address: 154, New Law Courts, Johannesburg, Union of South Africa.

Van der Pol, Balth, Jun., D.Sc.—B. Jan. 27th, 1889, at Utrecht (Holland). Educ. at Utrecht, graduating as *Candidaat* in the University (1914) and as *Doctorandus* (1916). Studied Experimental and Theoretical Physics, under Professors Julius and Ornstein. His interest in the theory and practice of wireless dates from 1904. Came to England in 1916 to study under Professor J. A. Fleming. Proceeded to Cambridge in 1917, working under Professor Sir J. J. Thomson, at the Cavendish Laboratory for about eighteen months. He is author of a number of monographs upon physical and radiotelegraphic subjects. Appointed Conservator and placed in charge of the physical research laboratory of Teyler's Institute, Haarlem (Holland). In April, 1920, he took his doctor of science degree at the Utrecht University *cum laude* on a thesis on the propagation of electro-magnetic waves through an ionised gas. He is one of the founders of the Dutch Radio Institute, of which society he is vice-president. He is now engaged on research work in the above mentioned laboratory with Professor H. A. Lorentz. Address: 4, Jan Smits-laan, Enidhoven, Holland.

Vanni, Dr. Giuseppe.—B. Albano Laziale (Rome) in 1862. Graduated in science 1887. Went to Strassburg 1890, where, under Professor Kohlrausch, of the Physical Institute, he studied electrical measurements. Appointed to teach physics at the Collegio Romano, Rome, 1894. Nominated professor and director of the physical laboratory of the Military Radiotelegraphic Institute in Rome, 1912. Took part in the International Radiotelegraphic Conference of London, 1912, as a member of the Italian delegation, and also at the Conferences held in Paris in 1912 and 1913. His works are principally concerned with electrodynamics, electrical engineering, and electrical waves. By means of an hydraulic microphone of his invention made interesting experiments in wireless telephony between Rome and Tripoli (1,000 km.) and between Rome and Treviso (420 km.), and in 1914 his paper on the "Progress and Actual State of Wireless Telegraphy and Telephony" gained the Cagnola Prize of the Royal Lombard Institute of Science and Literature in Milan. Address: Rome, Military Radiotelegraphic Institute, Viale Mazzini 10.

Vyvyan, R. N. Educ. Charterhouse. Elect. and Eng. training, Faraday House, 1896-1900. Assistant Engineer. Whitehaven, Burton-on-Trent, Portsmouth and Hammersmith. Joined Marconi's Wireless Telegraph Co., 1900. Built Poldhu Wireless Station, subsequently proceeding to Canada as Managing Engineer until 1908. Built Spanish-American chain of stations. Appointed, in 1910, Superintending Engineer of Marconi's Wireless Telegraph Co. Responsible for design and construction of most of the high-power stations erected by the Marconi Co. Joined R.F.C. 1916, served in France. Later sent to America as member of the British War Mission. Demobilised and returned to Marconi Co. early in 1919 in charge of design construction and management of all wireless stations owned or erected by that company. Addresses: Royal Air Force Club, Royal Automobile Club, and Marconi House, Strand, W.C.2.

Wade, C. F. Newton.—B. Shepton Mallet, Somerset. Five years with Messrs. Siemens Bros. & Co., at Woolwich, as Radio Engineer, during which time he was employed on extensive experiments on earth telegraphy, earthed and buried aërials and transmission of high-frequency currents along wires, in addition to ordinary engineering, designing and testing work in connection with Radio apparatus. Superintendent of Government Radiotelegraphs, British North Borneo, 1918. Postmaster-General and Superintendent of Land Telegraphs in addition in January, 1920. Address: Jesselton, British North Borneo, and Intake, Sheffield, Yorks.

Weagant, Roy A.—B. Morrisburg, Ontario, Canada, 1881. Educ. Stanstead College, Stanstead, Quebec, Canada, and McGill University, Montreal, Canada. Graduated from Electrical Engineering Course, 1905. Studied Physics under Sir Ernest Rutherford and first became interested in wireless through witnessing some of his experiments in Hertzian waves. Gained engineering experience with the Montreal Light Heat, and Power Company, the Westinghouse Electric Manufacturing Company of Pittsburg, Pa., and the De Laval Steam Turbine Company. Took up commercial wireless work in 1908. Entered service of the Marconi Wireless Telegraph Company of America, 1912, where he soon rose to the position of Chief Engineer. Appointed, 1920, Consulting Engineer, Radio Corporation of America. Fellow of the Institute of Radio Engineers and former member of its Board of Directors and Standardisation Committee. Inventor of a novel method of eliminating static interference. Awarded Liebmann Memorial Prize for 1920. Address: Douglas Manor, Long Island, New York.

Whiddington, Richard, M.A., D.Sc.—B. November 25th, 1885, in London. Educ. at St. John's College, Cambridge, where after taking degree in 1908, he undertook research work under Professor Sir J. J. Thomson at the Cavendish Laboratory. Elected Fellow of St. John's College, 1911. In September, 1914, went to Royal Aircraft Factory, Farnborough, to design aircraft wireless apparatus for the Flying Corps. Received first commission in Army in 1915, leaving Farnborough soon after. During the war designed a number of the standard R.A.F. wireless sets and assisted on the W/T Board and Inter-Allied W/T Commission in Paris. Demobilised with rank of major, June, 1919. Has published a number of original papers on various electrical subjects. Member of Sub-Committee "D" on Thermionic Valves, of Radio Research Board, of the Department of Scientific and Industrial Research. Professor of Physics, University of Leeds. Address: Leeds University.

Whitmore, G. Scovell.—B. Dawlish, 1881. Educ. St. Andrew's College, Dublin. Served under Eastern Telegraph Company, Ltd., at Porthcurnow and Malta cable stations. Entered Heaton works of Sir C. A. Parsons & Co., 1902, and became Chief Assistant to the Engr. and Gen. Manager of Northern Counties Electricity Supply Co., Ltd., in 1906. Joined the engineering staff of Marconi's Wireless Telegraph Co., Ltd. (1909), and appointed (1910) Managing Engr. at the Transatlantic W/T Station, Glace Bay, Canada. Since 1912 employed at the head office of Marconi's Wireless Telegraph Co., Ltd., mainly in connection with the construction and maintenance of high power W/T stations, occupying the position of Act. Superintending

Engineer, August, 1916—March, 1919, during absence of the Superintending Engineer on military service.

Wibier, Albert, Lieut.-Col. d'Etat Major.—B. Renaix, 1876. Sent, in 1911, by the King of the Belgians, to install the wireless network in the Belgian Congo. Became Director-General of that service. On returning became Director-General for the construction of new wireless services. Organised and controlled the wireless service of the Belgian Army during the late war. President of the Wireless Commission of the Belgian Aero Club, Member of the Comité National Belge de l'Union Internationale de Radiotélégraphie Scientifique. Address: 11, Rue de la ReINETTE, Brussels, Belgium.

Wien, Professor Max.—B. Königsberg, 1866. Made a special study of the subject of physics under Helmholtz and others, and assisted Röntgen, 1891-93. Devoted considerable attention to the study of electro-magnetic waves and their propagation, and was the originator of the quenched spark.

Wilson, Brig.-Gen. Samuel Herbert, C.B. (1918), C.M.G. (1914).—B. 1873. Entered Army-R.E., 1893. Captain 1904, Major 1913, Bt. Lt., Col. 1916, Bt. Col. 1917. Served S. Africa, 1899-1900 (Queen's Medal with two clasps). Served great war, 1914-18; General Staff Officer, 2nd Grade, 1911-15; General Staff Officer, 1st Grade, 1915-16; Brig.-Gen. General Staff, 1916. Principal Assistant Secretary, Committee of Imperial Defence and Head of Imperial External and Defence Branch Cabinet Secretariat. Secretary Imperial Communications Committee; Wireless Telegraphy Committee; Overseas Defence Committee; Home Ports Defence Committee. Officier Legion d'Honneur; French Croix de Guerre; Commandeur de la Couronne, Belgium; Belgian Croix de Guerre. Address: 22, Stanford Road, Kensington, W.8 (Tel. 5049 Western); and Heath Cottage, Puttenham, Surrey.

Wilson, Ernest.—Educ. the Yorkshire College Leeds. Whitworth Scholarship. Apprenticed to Greenwood & Batley, and Siemens Bros. Professor of Electrical Engineering at King's College. Dean of the Faculty of Engineering, King's College. M.I.C.E., M.I.E.E. M. Wireless Soc., London. Fellow of King's College. Author of "Electrical Traction" (Arnold, 2nd ed.), in collaboration with F. Lydale, B.A., B.Sc. Contributed various papers read before Royal Society, I.E.E., Royal Society of Arts, etc. Holder of Kelvin Prize of the I.E.E. (1921) Addresses: University of London, King's College, W.C.2, and Savile Club.

Wilson, William Hamilton.—B. 1878. Educ. Collegiate School, Wanganui, New Zealand. Apprenticed to Cable & Co., Marine Engineers, Wellington, N.Z. Electrical and mechanical courses at King's College, Strand, London, 1901 to 1904. Assistant Engineer Metropolitan Electrical Supply Co., Ltd., London, 1904 to 1906. Chief Assistant Electrical Engineer, and part-time Acting Electrical Engineer, to East Indian Railway Co., Bengal, India, 1906 to 1908. Electrical Engineer to John Birch & Co., Ltd., London Wall, London 1910 to 1911. Secretary and Director of the Wilson Apparatus Co., Ltd., Carlisle, 1911 to 1913. In private practice since 1913 as Electrical Engineer and Inventor at Kingston Hill. Inventor of various wireless telegraph apparatus, X-ray apparatus, and thermo-electric instruments. Designed some of the earliest transformers and apparatus used for army aircraft wireless, etc., before 1912.

Designed and manufactured transformers, wireless telegraph condensers and transmitting sets used in large numbers during the war by War Office, Admiralty and Royal Air Force, and since then for wireless in the Mercantile Marine. M.I.E.E. M. Röntgen Soc. Joint author of various papers in "The Electrician," on "Measurement of Self Induction, High Tension Discharge Apparatus," etc. Author of paper before Royal Society on "Ruhmkorff Coils," Electrician on "Method for Measurement of Self Induction," Physical Society on "Construction of Thermo-Electric Apparatus," Röntgen Society on "New Generator for X-ray Work." Address: 5-6, Bank Broadway, Kingston Hill, Surrey.

Yagi, Professor Hidetsugu.—B. Osaka, January, 1886. Graduated from the Tokyo Imperial University, 1909. Lecturer and later Professor of Electrical Engineering at the Sendai Higher Technical School. Studied in Dresden, London, and Harvard, 1913-16, engaging at the same time in several researches on radio frequency phenomena. Author of many scientific papers. Professor of Electrical Engineering at the Tohoku Imperial University and Member of the Institute of Radio Engineers.

Yokoyama, Eitaro.—B. 1883. Graduated Engineering College of the Tokyo Imperial University, 1908. Entered Ministry of Communications, Japan. Engaged in radio researches at the Electro-technical Laboratory of the Ministry. One of the inventors of T.Y.K. Oscillation Gaps for Radiotelephony. Awarded the Fifth Degree of Decoration, and granted many prizes for the invention, including the Academy Prize and Medal of Japanese Imperial Academy. Proceeded to America and Europe to study, 1916. Returned

to Japan, 1918, and resumed service at the same Laboratory. Promoted to the Head of the Radio Section of the Laboratory, 1920. M.I.R.E. (America). I.E.E. (Japan). Inst. of Japanese Telephone and Telegraph Engineers. Private address: Kiharayama 1523, Omori, Tokyo.

Zenneck, Professor, Dr. J.—B. April 15th, 1871, in Württemberg. Studied at Tübingen, mathematics and natural history, particularly zoology, 1889-94. Passed the State examination in these subjects, 1894. Obtained his doctorate, 1894. Studied natural history in London and elsewhere. Subsequently devoted himself entirely to physics. Assistant in the Physical Institute in Strassburg, 1895-99. Engaged in making tests with wireless telegraphy in the North Sea, 1899-1900. Assistant Professor of Physics in the Institute of Technology, Dantzic, 1905. Professor of Physics at the Institute of Technology, Brunswick, 1906. Joined the Badische Anilin- and Soda Fabrik, one of the largest chemical works in Germany, 1909. Professor of Physics at the Institute of Technology, Dantzic, 1911, Munich, 1913. During part of the war Technical Adviser to the Atlantic Communication Co., which then operated Sayville wireless station. Member of Bavarian Academy of Sciences. Fellow of the Institute of Radio Engineers. Contributed about 60 papers published in physical and technical journals and relating to various subjects of experimental and theoretical physics, especially electro-magnetic oscillations. Books: 1. "Electromagnetische Schwingungen und drahtlose Telegraphie" 1905; 2. "Lehrbuch der drahtlosen Telegraphie." Of No. 1 there exists a French, of 2 a French and English translation. Address: Technische Hochschule, München (Germany).

OBITUARY.

SINCE we went to press with our last edition, the world of wireless and associated sciences, has had to mourn the loss of two prominent men.

* * * * *

DR. ALEXANDER GRAHAM BELL passed away on the night of August 1st-2nd.

Born at Edinburgh on March 3rd, 1847, he was educated at the High School and the Edinburgh University. Later he went to America and became professor of vocal physiology at Boston University where his studies led him to the invention of the telephone in 1875. He transmitted speech over a long distance for the first time in August, 1876. Dr. Alexander Graham Bell held the Albert Medal of the Royal Society of Arts since 1902, the Hughes Medal of the Royal Society since 1918, and several honorary degrees. The freedom of Edinburgh was conferred upon him in 1920.

MR. L. H. WALTER, late Editor of *Science Abstracts*, and special contributor to the *Electrician*. During his lifetime he was always greatly interested in wireless.

LITERATURE OF WIRELESS TELEGRAPHY AND TELEPHONY

(A) New Radio Books (1922)

(B) Résumé of the More Important
Radio Articles (1922)

(C) Standard Radio Publications

(i) Books.

(ii) Periodicals.

LITERATURE OF WIRELESS TELEGRAPHY AND TELEPHONY

THE literature of Wireless Telegraphy and Telephony increases year by year, and has now reached a stage when only a portion of the volumes and articles published can be recorded. A selection of the more important New Books and Articles published during the past year are recorded below.

(A) NEW RADIO BOOKS (1922).

- Continuous Wave Wireless Telegraphy.** B. E. G. Mittell. [London: *Sir Isaac Pitman & Sons, Ltd.* Pp. 110. Price 2s.]
- Home Radio: How to Make It.** A. Hyatt Vernill. [London: *Harper & Bros.* Pp. 105. Price 3s. 6d.]
- Wireless for the Home.** N. P. Hinton. [London: *Sir I. Pitman & Sons, Ltd.* Pp. 87. Price 2s.]
- Elements of Radio Telephony.** W. C. Ballard, jr. [London: *McGraw-Hill Publishing Co.* Pp. 132.]
- Radio Receiving for Beginners.** R. T. Snodgrass and V. F. Camp. [London: *Macmillan & Co.* Pp. 99. Price 3s. 6d.]
- A Dictionary of Applied Physics.** Edited by Sir R. Glazebrook. 5 Vols. Vol. II., Electricity. [London: Price 63s. net, or £14 14s. the set.]
- The A, B, C of Vacuum Tubes in Radio Reception.** E. H. Lewis. [New York: *The Norman Henry Publishing Co.*, 2, West 45th Street, N.Y. Pp. 132. Price \$1.00.]
- How to make Commercial Type Radio Apparatus.** M. B. Slepser. [New York: *The Norman Henry Publishing Co.*, 2, West 45th Street, N.Y. Pp. 160. Price 75 cents.]
- Radio Telephony for Everyone.** L. M. Cockaday. [New York: *F. A. Stokes Co.* 1922. \$1.5.]
- The Continuous Wave Manual.** J. B. Dow. [San Francisco: *Pacific Radio Publishing Co.* 1922. Price \$1.00.]
- The Complete Radio Book.** R. F. Yates, L. G. Pacent. [New York: *Century Co.* 1922. Price \$2.00.]
- Radio Directory.** Vol. I. [New York: *The Radio Directory & Publishing Co.* Price \$1.00]
- Direction and Position Finding by Wireless.** R. Keen. [London: *The Wireless Press, Ltd.* Pp. 376. Price 9s.]
- Electromagnetic Theory.** O. Heaviside. [London: *Benn Bros., Ltd.* 3 Vols. Reprinted 1922. Price £5 5s.]
- Elementary Text Book on Wireless Vacuum Tubes.** J. Scott-Taggart. [London: *Radio Press, Ltd.* Price 10s.]
- Manuel de Radiotélégraphie Appliquée, a l'usage des electriciens, mécaniciens, monteurs et opérateurs radio-télégraphistes.** J. Brun. [Paris: *Albin Michel*, 22, rue Huygens. 1922. Pp. 430. Price 30 fr.]

- Guide des Candidats a l'emploi d'officier Radiotélégraphiste de la Marine marchande.** J. Brun. [Paris: *Albin Michel*, 22, rue Huygens. Pp. 148. Price 5 fr.]
- La T. S. F. des Amateurs.** F. Duroquier. [Paris: *Masson et Cie.*, 120, Boulevard Saint Germain. Price 12 fr.]
- Methode mnemonique pour apprendre les signaux Morse.** A. Bruyant. [Paris: *Des Forges*, 29, quai des Grands Augustins. Pp. 16. Price 3.75 fr.]
- Les courants alternatifs de haute fréquence.** A. Charbonneau. [Paris: *A. Michel*, 22, rue Huygens. Pp. —. Price 27 frs. 75 c.]
- Le livre de l'amateur de télégraphie sans fils.** J. Roussel. [Paris: *Viubert*. Pp. 304. Price 15 francs.]
- Radiotelefonía española.** R. Y. Sacasa. [Madrid: *El Telegrafo*. Pp. 56. Price 4 pes.]
- Radio Schnell telegraphie.** [Berlin: *Verlag J. Springer*. 1922.]
- Elements of Wireless Telegraphy and Handbook of Wireless Telegraphy.** Commander R. N. Gr. Mezevivis. [Athens: *Government Press*. Pp. 320.]
- Telegrafo senza fili e onde hertziane.** G. Murani. [Milan: *U. Hoepli*. 3rd Edition. Price 10 lire.]
- La telefonia senza fili.** U. Bianchi. [Milan: *U. Hoepli*. Price 10 lire.]
- Radiotelefonía.** D. Ravalico. [Turin: *S. Lattes & Co.* Price 14 lire.]
- Manuale pratico del radiotelegrafista.** G. Della Santa. [Milan: *U. Hoepli*. Price 6.50 lire.]
- Manuale Elementare di Radiotelegrafia dell' Ufficio Marconi.** Sacco and Celloni. [Genoa: *Tipografia "Radio"*. 2nd Edition, Vol. I. Generalità-Oscillazioni smorzate.]
- Misure correnti nella pratica radiotelegrafica.** G. Pession. [Leghorn: *Istituto Elettrotecnico e Radiotelegrafico della R. Marina*.]
- La Telefonia a grande distanza ed i ripetitori telefonici.** Craveri and Demaldè. [Turin: *S. Lattes*. Price 24 lire.]
- Elementi di radiotelegrafia.** Vicedomini and Zambon. [Leghorn: *S. Belforte*.] (Authorised translation of "The Principles underlying Radio Communication," published by the U.S. War Dept.)
- Die Einrichtung von Reichs Funklagen.** P. Münch. (Vol. 54 Post und Telegraphie in Wissenschaft und Praxis.) Dr. Andersch and Dr. H. Herdecker. [Berlin: *Verlag für Politik und Wirtschaft*. 1922. Pp. 72. Price 12 marks.]
- Die Fortschritte der Drahtlosen Telegraphie und ihre physikalischen Grundlagen.** J. Wiesent. [Pp. 36. Price 6 marks.]
- Elektromagnetische Schwingungen und Wellen.** J. Geitler. [Brunswick: *F. Vieweg & Sohn*. 1921. Pp. 218. Price 38 marks.]
- Die Drahtlose Telegraphieren und Fernsprechen mit Hilfe von Kathoden Röhren.** H. Thurn. [Berlin: *R. Dietze*. 1921. Pp. 106. Price 10 marks.]
- In Bannkreis von Nauen.** A. Fürst. [Stuttgart and Berlin: *Deutsche Verlags Anstalt*. Pp. 316. Price 75 marks.]
- Deutsches FunkerjahrBuch für das Jahr 1921.** C. W. Collatz. [Berlin: *F. Gunther & Sohn*; *A.G.* Pp. 160.]
- Von Morse bis Marconi.** A. Neuburger. [Berlin: *Ullstein & Co.* Pp. 241. Price 18 marks.]
- Lehrbuch der drahtlosen Telegraphie und Telephonie.** F. Anderle. [Leipzig and Vienna: *F. Deuticke*. 5th Edition. Pp. 275.]
- Die Drahtlose Telegraphie und Telephonie.** P. Lertes. [Dresden and Leipzig: *T. Steinkopff*. 1922. Pp. 152. Price 78 marks.]
- Drahtloser Übersee Verkehr.** G. Eichhorn. [Zurich: *T. Schöpp & Cie.* Pp. 69. Price 7 fr.]

(B) RÉSUMÉ OF THE MORE IMPORTANT RADIO ARTICLES PUBLISHED IN 1922

RADIO FREQUENCY MEASUREMENTS AND THEORY.

- Resistance and Capacity of Coils at Radio Frequencies.** J. H. Morecroft. [*Proceedings of the Institute of Radio Engineers*, 10, p. 261, August, 1922.]
- Self Oscillating Coupled Systems.** F. Harms. [*Annalen der Physik*, 66, p. 25, October, 1921.]
- Resonance and Damping in the Case of Imperfect Self-Excitation.** H. Pauli. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 42, January, 1922.]
- Determination of the Decrement of a Distant Station by means of a Coil Aerial.** J. Erskine Murray and B. Williams. [*Journal of the Institution of Electrical Engineers*, 60, p. 347, March, 1922.]
- Sensitive Method of Determining the Frequency and Amplitude of High Frequency Oscillations.** J. J. Dowling and J. J. McHenry. [*Electrician*, 87, p. 675, November 25th, 1921.]
- The Damping of Two Electrostatically Coupled Circuits.** W. Grosser. [*Archiv für Elektrotechnik*, 10, p. 257, November, 1921.]
- Self Inductance of Solenoids of Rectangular Shape.** A. Esau. [*Jahrbuch der drahtlose Telegraphie*, 18, p. 453, December, 1921.]
- The Distributed Capacity of Inductance Coils.** G. Breit. [*Physical Review*, 18, p. 133, August, 1921.]
- Diffraction of Plane Electromagnetic Waves by a Perfectly Reflecting Sphere.** F. P. White. [*Proceedings of the Royal Society*, 100, p. 505, February, 1922.]
- On Oscillation Circuits with Iron Core Coils.** H. Schunck and J. Zenneck. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 170, March, 1922.]
- Atmospheric Disturbances from Observations with a Wireless Receiver at the Königstuhl, near Heidelberg.** F. Wolf. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 289, April, 1922.]
- Radiotelegraphy.** G. Marconi. [*Journal of the American Institute of Electrical Engineers*, p. 561, August, 1922.]
- Decoupling of Electrical Systems.** Nv. Korshenewsky and M. Wien. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 356, June, 1922.]
- Standard Wavemeter of the Bureau of Standards (Type R 70 B).** R. T. Cox. [*Optical Society of America Journal*, 6, p. 162, March, 1922.]
- The Field Radiated from Two Horizontal Coils. Aeroplane Landing aided by Wireless Signals.** G. Breit. [*Bureau of Standards Bulletin*, 17, p. 589, 1922.]
- The Effective Self Capacity Inductance and Resistance of Coils.** G. W. O. Howe. [*Journal of the Institution of Electrical Engineers*, 60, p. 67, November, 1921.]
- An Investigation of Transmitting Aerial Resistances.** T. L. Eckersley. [*Journal of the Institution of Electrical Engineers*, 60, p. 581, May, 1922.]
- On the Earth Resistance of Aerials.** A. Meissner. [*Jahrbuch der drahtlose Telegraphie*, 18, p. 322, November, 1921.]
- The Piezo Electric Resonator.** W. G. Cady. [*Proceedings of the Institute of Radio Engineers*, 10, p. 83, April, 1922.]
- Piezo Electric Methods for Generating Electrical Oscillations of Constant Frequency.** W. G. Cady. [*Physical Review*, 19, p. 381, April, 1922.]
- Capacity and Eddy Current Effects in Inductometers.** S. Butterworth. [*Proceedings of the Physical Society of London*, 33, p. 312, August, 1921.]
- Eddy Current Losses in Cylindrical Conductors. A.C. Resistance of Short Coils.** S. Butterworth. [*Royal Society of Philosophical Transactions*, 222, p. 57, September, 1921.]
- Effective Capacity of Multilayer Coils with Square and Circular Section.** G. Breit. [*Philosophical Magazine*, 43, p. 963, May, 1922.]

TRANSMITTING APPARATUS.

- Radio Telegraphy.** G. Marconi. [*Proceedings of the Institute of Radio Engineers*, 10, p. 215, August, 1922.]
- Theory of Arc Generators of H.F. Currents.** E. Mayer. [*Zeitschrift für Technik Physik*, 2, pp. 18, 40, 73 and 94.]
- Earthing Resistance of Antenna.** A. Meissner. [*Jahrbuch der drahtlose Telegraphie*, 18, p. 322, November, 1921.]
- High Speed Wireless Telegraphy.** A. G. T. Cusins. [*Journal of the Institution of Electrical Engineers*, 60, p. 245, February, 1922.]
- An Investigation of Transmitting Aerial Resistances.** T. L. Eckersley. [*Journal of the Institution of Electrical Engineers*, 60, p. 581, May, 1922.]
- Static Frequency Multiplier for the Commercial Production of Very High Frequencies in Wireless Telegraphy.** M. Latour. [*Revue Générale de l'Electricité*, 11, p. 961, July, 1922.]

RADIO INSTALLATIONS (INCLUDING DIRECTION FINDING).

- New York Radio Central Station.** [*Radio Review*, 3, p. 3, January, 1922.]
- The Radio Centre of Saint Assize.** G. Malgom and M. Adam. [*Revue Générale de l'Electricité*, 12, p. 169, August 5th, 1922. *Radio-électricité*, 3, p. 284, July, 1922.]
- Opening of the New Long Island Station of the Radio Corporation of America.** [*General Electric Review*, 25, p. 53, January, 1922. *Radio Review*, 3, p. 2, January, 1922. *Wireless World*, 9, p. 711, February 18th, 1922.]
- The Radio Direction Finder and its Application to Navigation.** F. W. Kolster and F. W. Dunmore. [*Scientific Papers Bureau of Standards*, 428, January, 1922.]

RADIOTELEPHONY.

- Operation of the Modulator Tube in Radiotelephony.** E. S. Purington. [*Scientific Papers Bureau of Standards*, 243, p. 377, 1921.]
- Some Experiments in Radio Telephony.** G. Pession. [*The Wireless World and Radio Review*, 10, p. 164, May, 1922.]
- Analysis of the Energy Distribution in Speech.** L. B. Crandall and D. Mackenzie. [*Physical Review*, 19, p. 231, March, 1922.]

RECEIVING APPARATUS.

- The Recording of High Speed Signals in Radio Telegraphy.** J. Weinberger. [*Proceedings of the Institute of Radio Engineering*, 10, p. 176, June, 1922.]
- A Visual and Photographic Device for Recording Wireless Signals.** C. A. Hoxie. [*Proceedings of the Institute of Radio Engineers*, 9, p. 506, December, 1921.]
- A Telephone with increased Sensitivity.** G. Seibt. [*Elektrotechnische Zeitschrift*, 43, p. 269, 1922. *Jahrbuch der drahtlose Telegraphie*, 19, p. 315.]
- New Viewpoint on the Telephone and its Efficiency.** H. Hecht. [*Zeitschrift für Technik Physik*, 3, No. 2, p. 46, 1922.]
- On the Theory of Differential Receiving Systems.** J. Bethenod. [*Radio-électricité*, 3, p. 55, 1922.]
- Notes on the Design of Radio Frequency. Interval Amplifier Transformers using Iron Cores.** A. S. Blatterman. [*The Wireless World and Radio Review*, 10, pp. 48, 78, 104, April, 1922.]

VALVES AND VALVE APPARATUS (INCLUDING AMPLIFIERS).

- The Development of Tube Transmitters by the Telefunken Company.** A Meissner. [*Proceedings of the Institute of Radio Engineers*, 10, p. 3, February, 1922.]
- A New Rectifier.** V. Bush and C. G. Smith. [*Proceedings of the Institute of Radio Engineers*, 10, p. 41, February, 1922.]
- Some Recent Developments of Regenerative Circuits.** E. H. Armstrong. [*Proceedings of the Institute of Radio Engineers*, 10, p. 244, August, 1922.]
- Naval Vacuum Tube Transmitters.** T. Johnson, jr. [*Proceedings of the Institute of Radio Engineers*, 9, p. 381, October, 1921.]
- The Frequency Jump of Valve Transmitters with Electrostatic Coupling.** W. Grosser. [*Archiv für Elektrotechnik*, 10, p. 317, December, 1921.]
- The Vacuum Valve and its Technical Applications.** H. Barkhausen. [*Jahrbuch der drahtlose Telegraphie*, 18, p. 402, December, 1921.]
- On a Type of Oscillation Hysteresis in a Simple Triode Generator.** E. V. Appleton and B. van der Pol. [*Philosophical Magazine*, 43, p. 177, January, 1922.]
- Design of Radio Frequency Intervalve Transformers Using Iron Cores.** A. S. Blatterman. [*The Wireless World and Radio Review*, 10, pp. 48, 78, 104, April, 1922.]
- The Thermionic Triode as Rectifier.** E. B. Moullin and L. B. Turner. [*Journal of the Institution of Electrical Engineers*, 60, p. 706, June, 1922.]
- An Electron Tube Transmitter of Completely Modulated Waves.** L. M. Hull. [*Scientific Papers Bureau of Standards*, No. 381.]
- Oscillation Hysteresis in a Triode Generator with Two Degrees of Freedom.** B. van der Pol, jr. [*Philosophical Magazine*, 43, p. 700, April, 1922.]
- Effect of Pressure and Gas Content on the Action of Vacuum Tube Detectors.** H. A. Brown and C. T. Knipp. [*Physical Review*, 19, p. 278, March, 1922.]
- Curve Form and Phase of the Oscillations in Valve Transmitters.** E. Alberti and G. Zickner. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 2, January, 1922.]
- The Magnetron.** A. W. Hull. [*Journal of the American Institution of Electrical Engineers*, 40, p. 715, September, 1921.]
- Magnetic Control of Thermionic Emission from a Wire by Current in the Wire : Magnetron.** A. W. Hull. [*Physical Review*, 19, p. 533, May, 1921.]
- On the Influence of Low Frequency on an Electron Relay Generator.** E. Mauz and J. Zenneck. [*Jahrbuch der drahtlose Telegraphie*, 19, p. 256, April, 1922.]
- The Disappearance of Gas in the Electric Discharge.** Research Staff General Electric Co. [*Philosophical Magazine*, 40, p. 585, November, 1920, 41, p. 685, May, 1921, 42, pp. 227 and 914, August, 1921, and May, 1922.]
- The Effect of Absorbed Gas on the Conductivity of Glass.** V. Bush and L. H. Connell. [*Journal of the Franklin Institute*, 194, p. 231, August, 1922.]
- Resistance Amplifiers.** L. Brillouin. [*L'Onde Electrique*, 1, pp. 7, 101.]
- Short Electric Waves obtained by Valves.** E. W. B. Gill and J. H. Morrell. [*Philosophical Magazine*, 44, p. 161, July, 1922.]
- On the Electromagnetic Screening of a Triode Oscillator.** R. L. Smith Rose. [*Proceedings of the Physical Society of London*, 34, p. 127, June, 1922.]

CARRIER CURRENT TELEGRAPHY AND TELEPHONY (WIRED WIRELESS.)

- Wireless Communication between Power Stations and Sub-Stations.** G. von Arco. [*Electrician*, 87, p. 205, August 12th, 1921.]
- High Frequency Telephony : Application to Telephonic Communication by High-Tension Networks.** M. Latour. [*Revue Générale de l'Electricité*, 10, p. 675, November 12th, 1921.] -

(C) STANDARD RADIO PUBLICATIONS
and Subjects intimately connected with Wireless
Research and Development.

(1) BOOKS.

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BELGIUM.

- *Aperçu sur la Télégraphie sans Fils en Belgique. Paul Dubois. [Liège : Imprimerie La Meuse. Pp. 120.]
- *A Propos de Télégraphie sans Fils (La Loi du 8 Juillet 1908, et les Signaux FL). M. L. Vandevyver. [Ghent : H. Rousseuw. 1912. Pp. 20. Price 2 fr.]
- *De l'Emploi des Appareils de Télégraphie sans Fil pour l'Observation des Courants Atmosphériques dans les Régions Polaires. A. Boutquin. [Brussels : Veuve Ferd. Larcier. 1907. Pp. 16. Price 0.75 fr.]
- *La Captation ou la Reception des ondes Hertziennes. A. Boutquin. [Brussels : Veuve Ferd. Larcier. 1913. Pp. 13. Price 1 fr.]
- *La Télégraphie sans Fil à Travers les Ages. M. Pierard. [Brussels University.]
- La Télégraphie sans Fil au Congo Belge. R. B. Goldschmidt and R. Braillard. [Brussels : M. Hayez. Pp. 120.]
- *Secret de la Correspondance et Monopole radiotélégraphiques. M. L. Vandevyver. [Ghent : H. Rousseuw. 1913. Pp. 26. Price 2 fr.]
- *Télégraphie sans Fil. L. van Aerschodt. [Brussels : Veuve Ferd. Larcier. 1913. Pp. 27. Price 0.50 fr.]
- *Télégraphie sans Fil Appliquée à la Météorologie aux Previsions du Temps et à l'étude de la Physique du Globe. A. Boutquin. [Brussels : Veuve Ferd. Larcier. 1911. Pp. 40. Price 1 fr.]
- *Télégraphie sans Fil et la Téléphonie sans Fil. F. Fontaine. [Liège : Imprimerie La Meuse. 1911. Pp. 115. Price 3 fr.]

BRAZIL.

- Radiotelegraphia e sua applicacao no Brasil. Francisco Bhering.
- Radiotelegraphia no Brasil. Francisco Bhering. [Imprensa Nacional. 1914. Pp. 341.]
- Telegraphia sem fio. Francisco Bhering. [Typographia Nacional. 1914. Pp. 101.]
- Telegraphia sem fio e seus ultimos melhoramentos. Francisco Bhering. [Typographia Nacional. 1908. Pp. 52.]
- Telegraphia sem fio e Cartographos Conferencia. Francisco Bhering. [Typographia Esperanca. 1914.]
- Telegrapho sem fio. Ricardo Frederico de Lima. [Rio de Janeiro : Officina Typographica da Escola Gerson.]

DENMARK.

- Laerebog i traadlos Telegrafi. O. Lund Johansen. [Copenhagen K.: G. E. C. Gad, Vimmelskiftet, 32. Price 11.00 kr.]
- Moderne Radiomodlagere Elektronrørets Teori og Anvendelse. [Copenhagen K.: G. E. C. Gad, Vimmelskiftet, 32. Price 3.00 kr.]

FRANCE.

- ABC de T.S.F.** [Paris: S.T.M., 57, Rue de Vanves. 1921. Pp. 35. Price 3.50 fr.]
- Appareils et Installations Télégraphiques.** E. Montoriol, with a Preface by M. Blondel. [Paris: Librairie J. B. Baillière et Fils. 1921. Pp. 625, with 440 figures. Price 40 fr.]
- Applications de la Télégraphie sans Fil.** E. Rothé. [Paris: Librairie Beger-Levauult, 5-7, Rue des Beaux-Arts. Fourth edition. 1918. Price 6.80 fr.]
- Applications de la Télégraphie sans Fil.** P. Jégou. [Paris: Librairie Desforges 29, Quai des Grands-Augustins. Pp. 70. Price 2.25 fr.]
- *Carnet d'Enregistrement des Dépêches Météorologiques transmises par Télégraphie sans Fil.** [Paris: A. Michel, 22, Rue Huyghens. 2nd edition. Price 1 fr.]
- Cours Élémentaire de Télégraphie sans Fil.** G. Viard. [Paris: Librairie de l'Enseignement Technique. 3, Rue Thénard. 1918. Pp. 300. Price 15 fr.]
- Cours Technique du Centre d'Instruction pour Élèves-Officiers Radiotélégraphistes.** [Paris: Imprimerie Nationale. 1918. Pp. 180+336+209.]
- Éléments de Télégraphie sans Fil Pratique.** F. Duroquier. [Paris: Dunod, 47-49, Quai des Grands-Augustins. 2nd edition. 1920. Pp. 130. Price 7 fr.]
- Étude de quelques Problèmes de Radiotélégraphie.** H. de Bellescize. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Pp. 174. Price 16 fr.]
- Introduction à la Théorie des Courants Téléphoniques et de la Radiotélégraphie.** J. B. Pomey. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Pp. xiv+510. Price 50 fr.]
- La direction des Avions par Télégraphie sans Fil.** M. Percheron. [Paris: Librairie Ernest Leroux. Pp. 60. Price 2 fr.]
- La Mémoire instantanée des signaux Morse.** Hausser. [Paris: Etienne Chiron, 40, Rue de Seine. 1921. Price 6 fr.]
- La Théorie et la Pratique des Radiocommunications. Vol. I. Introduction à l'Étude des Radiocommunications.** Léon Bouthillon. [Paris: Librairie Delagrave. 1919. Pp. ix+193. Price 20 fr., or 28 fr. cloth.]
- La Théorie et la Pratique des Radiocommunications—Vol. II. La Propagation des Ondes Électromagnétiques à la Surface de la Terre.** Léon Bouthillon. [Paris: Librairie Delagrave. 1921. Pp. xv+340, with 133 figures. Price 20 fr.]
- Les Applications de la Physique pendant la Guerre.** H. Vigneron. [Paris: Masson et Cie, 120, Boulevard Saint-Germain. Pp. viii+322. Price 7 fr. net.]
- Les Tubes à Vide en Radiotélégraphie.** P. Dapsence. [Paris XIe: G. Péricaud, 85, Boulevard Voltaire. Second edition. 1921. Pp. 49. Price 2.50 fr.]
- Lexique Technique Anglais-Français.** Lieut. G. Malgorn, in collaboration with M. Desmarests. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. 1920. Pp. xxi+216. Price 10 fr.]
- Livre de l'Amateur de T.S.F.** Joseph Roussel. [Paris: Vuibert, 63, Boulevard Saint-Germain. 1921. Pp. 304. Price 15 fr.]
- Longueurs d'Onde et Propagation.** M. Vieillard. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. 1921. Pp. xii+416. Price 55 fr.]
- Manuel Élémentaire de Télégraphie sans Fil.** C. Tissot. [Paris: Augustin Challamel, 17, Rue Jacob. 1918. Price 12 fr.]
- Manuel pratique de Télégraphie sans Fil.** L. Berranger. [Paris: Etienne Chiron, 40, Rue de Seine. 1921. Pp. 110, with 53 figures. Price 3 fr.]
- Manuel théorique et pratique de Télégraphie sans Fil terrestre et Maritime.** J. Galopin. [Paris: Bernard Tignol, 53 bis, Quai des Grands-Augustins. Second edition. 1919. Pp. vii+366. Price 9 fr.]

- Mémoire facile de l'induction entre spires.** P. Dapsence. [Paris XIe: G. Péricaud, 85, Boulevard Voltaire. Price 0.50 fr.]
- Notions Élémentaires de Télégraphie sans Fil et Construction pratique de Postes Récepteurs.** Jean Rémaur. [Paris: Librairie Desforges, 29, Quai des Grands-Augustins. 1921. Pp. 116. Price 7.50 fr.]
- Notions Élémentaires et Pratiques de T.S.F. A l'usage des personnes voulant recevoir les signaux horaires et les dépêches météorologiques de la Tour Eiffel.** E. Baudran. [Paris: L. Geisler, 1, Rue de Médicis. Price 3.75 fr.]
- Notions générales sur la Radiotélégraphie et la Radiotéléphonie.** R. de Valbreuze. [Paris: La Lumière Electrique, 142, rue de Rennes. Sixth edition. 1914. Pp. 475. Price 15 fr.]
- Nouveau Traité Pratique de T.S.F.** P. le Graverend. [Paris, XIe: G. Péricaud, 85, Boulevard Voltaire. Eighth edition. Pp. 80. Price 2 fr.]
- Oscillations Électriques (Principes de la Télégraphie sans Fil).** C. Tissot. [Paris, VIe: Gaston Doin, 8, Place de l'Odéon. Second edition.]
- Oscillations Electro-magnétiques et la Télégraphie sans Fil.** J. Zenneck. Translated from the German by Blanchin, Guérard et Picot. [Paris: Gauthier-Villars et Cie, 55, Quai des Grands-Augustins. 2 vols. Price 34 fr. each.]
- Précis de Télégraphie sans Fil.** J. Zenneck. Translated from the German by Blanchin, Guérard et Picot. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Price 24 fr.]
- Premières Notions de Télégraphie et de Téléphonie sans Fil.** Bégébé. [Paris: Bibliothèque Omnia, 20, rue Duret. Pp. 96. Price 4 fr.]
- Principes Élémentaire de Télégraphie sans Fil.** R. D. Bangay. [London: The Wireless Press, Ltd., 12-13, Henrietta Street, W.C.2. Pp. xii+249. Price 9s.]
- Radiotélégraphie, Notions et Conseils Pratiques.** M. Magny. [Paris: A. Michel, 22, Rue Huyghens. Price 2 fr.]
- Radiotélégraphie Pratique et Radiotéléphonie.** P. Maurer. [Paris: Dunod, 47-49, Quai des Grands-Augustins. 1920. Pp. 386. Price 21 fr.]
- Réception des Signaux Horaires Radiotélégraphiques.** Bureau des Longitudes. [Paris: Gauthier-Villars et Cie, 55, Quai des Grands-Augustins. Second edition. Price 5.50 fr.]
- Relais et Amplificateurs.** Paul Dapsence. [Paris: Avenir de la T.S.F., 18, rue Caffarelli. Pp. 16. Price 0.60 fr.]
- Signaux Horaires et Radiotélégrammes Météorologiques transmis chaque jour par la Tour Eiffel.** [Paris: Gauthier-Villars et Cie., 55, Quai des Grands Augustins. Price 2.50 fr.]
- Technique de la Radiotélégraphie.** Rein. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Price 18 fr.]
- Télégraphie sans Fil, Applications Pratiques des Ondes Électriques.** A. Turpain. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augusins. Second edition, 1908. Price 24 fr.]
- Télégraphie sans Fil.** Berget. [Paris: Hachette, 79, Boulevard Saint-Germain. Price 5 fr.]
- Télégraphie sans Fil.** André Broca. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Second edition. Price 8.00 fr.]
- Télégraphie sans Fil.** Jean Laurent. [Paris: Henri Gautier, 55, Quai des Grands-Augustins. Pp. 36. Price 0.15 fr.]
- Télégraphie sans Fil.** Lucien Fournier. [Paris: Garnier frères, 6, rue des Saints-Pères. 1912. Pp. 193. Price 2 fr.]
- Télégraphie sans Fil.** E. Coustet. [Paris: Charles Mendel, 118, Rue d'Assas. Pp. 100. Price 2 fr.]
- Télégraphie sans Fil.** E. Petit and L. Bouthillon. [Paris: Librairie Delagrave, 15, Rue Soufflot. Fourth edition. Pp. vii+304. Price 15 fr.]
- T.S.F. et la Guerre.** E. Sinturel. [Lyon: Imprimeries Réunies, 8, rue Rachais. Second edition, 1921. Pp. 64. Price 15 fr.]

- Télégraphie sans Fil et la Loi.** A. Perret-Maisonneuve. [Paris: H. Desforges, 29, Quai des Grands-Augustins. Price 10.50 fr.]
- *Télégraphie sans Fil (la Télémechanique et la Téléphonie sans Fil à la portée de tout le monde).** R. Monier. [Paris: Librairie Dunod, 47-49, Quai des Grands-Augustins. Pp. 242. Price 5.25 fr.]
- Télégraphie sans Fil et les Ondes Électriques.** J. Boulanger et G. Ferrié [Paris: Librairie Berger-Levrault, 5-7, Rue des Beaux Arts. Ninth edition, 1918. Pp. 487. Price 15 fr. Cloth, 20 fr.]
- T.S.F. Manuel Pratique de l'Amateur.** H. Chazelle. [Paris: Librairie Desforges, 29, Quai des Grands Augustins. Price 6 fr.]
- T.S.F. par les Tubes à Vide.** Pierre Louis. [Paris: Librairie Vuibert, 63, Boulevard Saint-Germain. - 1920. Pp. 143. Price 6 fr.]
- T.S.F. Vade-mecum de l'Amateur sans-filiste.** S. Mariens. [Paris: Librairie Amat., 11, Rue de Mézières. Price 5 fr.]
- Télégraphie sans Fil (Réception des Signaux Horaires et des Télégrammes Météorologiques).** Docteur P. Corret. [Paris: Edition du Cosmos, 5, Rue Bayard. Pp. 125. Price 2 fr.]
- *Télégraphie sans Fil dans les Rapports Internationaux.** Devaux Jacques. [A. Pedone, 1914. Price 4.80 fr.]
- Télégraphie sans Fil pour Tous.** F. Duroquier. [Paris: E. Orlhac, 1, rue Dante. Pp. 66. Price 3 fr.]
- T.S.F. Postes Récepteurs.** E. Monier. [Paris: Dunod, 47-49, Quai des Grands-Augustins. Second edition. 1917. Pp. iv+122. Price 2 fr.]
- Télégraphie et Téléphonie sans Fil.** C. Gutton. [Paris: Librairie Armand Colin, 103, Boulevard Saint-Michel. 1921. Pp. 188. Price 5 fr., or 6 fr. bound.]
- *Téléphonie sans Fil.** Scheidt-Boon. [Valenciennes: 36, Rue de Mons. 1914.]
- Théorie de la T.S.F. par Analogies Mécaniques.** P. Dapsence. [Paris, XIe: G. Péricaud, 85, Boulevard Voltaire. Second edition. Pp. 92. Price 1.75 fr.]
- Théorie de Maxwell et les Oscillations Hertiennes. La Télégraphie sans Fil.** H. Poincaré. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Third edition. 1908. Pp. 100. Price 6 fr.]
- Théorie Générale de l'Electromagnetisme.** G. E. Pineau. [Paris: Dunod, 47-49, Quai des Grands-Augustins. Pp. 72. Price 7 fr.]
- Théorie Simplifiée de la Télégraphie sans Fil.** Verdurand. [Paris: Dunod, 47-49, Quai des Grands-Augustins. 1917. Price, 4 fr.]
- Tubes à Vide.** Paul Dapsence. [Paris XIe: G. Péricaud, 85, Boulevard Voltaire. Second edition. 1921. Pp. 50. Price 2.50 fr.]
- Vocabulaire de Télégraphie et de Téléphonie sans Fil en Cinq Langues.** H. Viard. [Paris: Gauthier-Villars et Cie., 55, Quai des Grands-Augustins. Pp. x+108. Price 15 fr.]

GERMANY.

- Das drahtlose Telegraphieren u. Fernsprechen.** H. Thürn. [Berlin: Rich. Dietze. Third edition. 1921.]
- Die Funkentelegraphie.** C. W. Collatz. [Berlin: George Siemens. Third edition, 1921.]
- Die Neuere Entwicklung der Funkentelegraphie.** H. Wigge. [Cothen-Anhalt: Verlag der Ingenieur-Zeitung. Second edition, 1921. Pp. v+71, with 59 illustrations.]
- Drahtlose Telegraphie und ihr Einfluss auf den Wirtschftsverkehr, unter besonderer Berücksichtigung des Systems Telefunken.** E. Nesper. [Berlin: Julius Springer. 1905. Price M. 4.95.]
- Drahtlose Telegraphie.** G. Eichhorn. [Berlin, W.10.: Walter de Grayter & Co. 1904. Price 5s.]
- *Drahtlose Telegraphie und Telephonie.** G. Partheil. [Berlin: Gerdes und Hadel. Second edition, 1911. Price M. 6.]

- Einführung in die Elektrotechnik Unter Zugrundelegung der Vorlesungen.** Professor Slaby. Revised by Otto Nairz. [Leipzig: J. A. Barth. Pp. viii+415. Price M. 25.20.]
- Einführung in die moderne drahtlose Telegraphie und ihre Praktische Verwendung.** Hugo Mosler. [Brunswick: Friedrich Vieweg und Sohn, 1920. Pp. 240, with 218 figures. Price M. 24.]
- Elektrische Lichtbogen.** H. Th. Simon. [Leipzig: Hirzel, Königstrasse, 2. 1911. Price 1s. 5d.]
- *Elektrischen Wellentelegraphie.** O. Arendt. [Brunswick: Fr. Vieweg und Sohn. 1907. Price M. 10.5.]
- *Elektromagnetische Schwingungen und Drahtlose Telegraphie.** J. Zenneck. [Stuttgart: Ferd. Enke. 1905. Price M. 28.]
- Elektromagnetische Schwingungen und Wellen.** Josef Geitler. [Brunswick: Vieweg u. Sohn, 1921. Second edition. Price M. 38.]
- Entdeckungsfahrten in den elektrischen Ozean.** A. Slaby. [Berlin: Leonhard Simion. 1911.]
- *Experimentelle Untersuchungen aus dem Grenzgebiet zwischen drahtloser Telegraphie und Luftelektrizität.** M. Dieckmann. [Berlin: Julius Springer. 2 vols., 1912. Price M. 4.95.]
- *Fortschritte auf dem Gebiete der drahtlosen Telegraphie.** A. Prasch. [Stuttgart: Ferd. Enke. 1906. Price M. 8.40.]
- Frequenzmesser und Dämpfungsmesser.** E. Nesper. [Berlin, W.10: Walter de Grayter & Co. 1907. Price 11s.]
- *Funkentelegraphie.** A. Slaby. [Berlin: Julius Springer. 1897. Price M. 2.]
- Funkentelegraphie im Recht.** H. Thurn. [Munich: J. Schweitzer, 1913. Price M. 6.]
- Funkentelegraphie für Flugzeuge.** E. Niemann. [Berlin: R. C. Schmidt & Co. 1921. Pp. 410, with 343 figures. Price M. 120.]
- Grundriss der Funkentelegraphie in gemeinverständlicher Darstellung.** F. Fuchs. [Munich: R. Oldenburg. Eleventh edition, 1920. Pp. 73.]
- Handbuch der drahtlosen Telegraphie und Telephonie.** Nesper. [Berlin: Julius Springer. Two volumes. 1921.]
- Handbuch für Funkentelegraphisten.** O. Ohlsberg. [Berlin: Decker. Second edition, 1918.]
- *Lehrbuch der Drahtlosen Telegraphie.** J. Zenneck. [Stuttgart: Ferd. Enke. 1916. Price M. 15.]
- Lehrbuch der Drahtlosen Telegraphie und Telephonie.** Franz Anderle. [Leipzig and Vienna: Franz Deuticke. Fifth edition, 1922. Price 8s. 5d.]
- Leitfaden der Drahtlosen Telegraphie für die Luftfahrt.** Max Dieckmann. [Munich: R. Oldenburg. Pp. 214.]
- Lichtbogen als Wechselstromerzeuger.** H. K. W. Wagner. [Leipzig: S. Hirzel, Königstrasse 2. 1910.]
- *Physik des Aethers auf Elektromagnetischer Grundlage.** P. Drude. [Stuttgart: Ferd. Enke. New edition, edited by W. König. 1912. Price M. 16.]
- *Physikalische Grundlagen der Elektrotechnik.** F. F. Martens. [Brunswick: Vieweg und Sohn. Second edition. Price M. 21.]
- Radiotelegraphie.** O. Nairz. [Leipzig: J. A. Barth. 1908.]
- *Radiotelegraphische Gleichstrom-Tonsender.** H. Rein. [Berlin: Julius Springer. 1912.]
- Radiotelegraphisches Praktikum.** H. Rein and K. Wirtz. [Berlin: Julius Springer. Revised edition. 1921. Pp. xviii+557. Price M. 120.]
- *Telegraphie ohne Draht.** A. Righi and B. Dessau. [Brunswick: Vieweg und Sohn. Second edition, 1907. Price M. 24.75.]
- *Telegraphie und Telephonie ohne Draht.** Otto Jentsch. [Berlin: Julius Springer. 1904. Price M. 5.]

- *Telephonie ohne Draht.** H. Markau. [Brunswick: Vieweg und Sohn. Second edition, 1907. Price M. 7.8.]
- Von Morse bis Marconi.** A. Neuberger. [Ullstein & Co.]
- Wellentelegraphie.** Hanns Gunther. [Stuttgart: Francksche Verlagshandlung, 1921. Pp. 112, with 61 figures. - Price M. 6.60, or M. 9.80 bound.]

GREAT BRITAIN.

- A Catalogue of British Scientific and Technical Books (Including Wireless).** Prepared by a Committee of the British Science Guild. [London: The British Science Guild. 1921. Pp. xviii+376. Price 10s. net.]
- A Dictionary of Applied Physics.** Edited by Sir R. Glazebrook. 5 Vols. Vol. II., Electricity. [London: Macmillan & Co., Ltd., St. Martin's Street. Price 63s. net or £14 14s. the set.]
- A Short Course in Elementary Mathematics and their Application to Wireless Telegraphy.** S. J. Willis. [London: The Wireless Press, Ltd., 12/13, Henrietta Street, W.C.2. 1917. Pp. 182. Price 5s.]
- Admiralty Handbook of Wireless Telegraphy, 1920.** [London: H.M. Stationery Office. 1920. Pp. viii+477. Price 7s. 6d. net.]
- Alexanderson System for Radio Telegraph and Radio Telephone Transmission.** Elmer E. Bucher. [New York: Wireless Press Inc., London; The Wireless Press, Ltd., 12-13, Henrietta Street, W.C.2. 1920. Pp. 55. Price 10s. 6d. net.]
- Alternating Current Work.** W. Perren Maycock. [London: I. Pitman & Sons, Ltd., Parker Street, Kingsway, W.C.2. Second edition. Pp. 420, with 260 illustrations. Price 10s. 6d.]
- Alternating Current Work: An Outline for Students of Wireless Telegraphy.** A. Shore, A.M.I.E.E. [London: The Wireless Press, Ltd., 12/13, Henrietta Street, W.C.2. 1919. Pp. ix+163. Price 3s. 6d.]
- Amateur Operator's Diary and Notebook 1920.** [London: The Wireless Press, Ltd., 12/13, Henrietta Street, W.C.2. Price 3s. 6d.]
- Arithmetic of Telegraphy and Telephony.** T. E. Herbert and R. G. de Wardt. [London: Sir Isaac Pitman & Sons, Ltd. 1921. Pp. vii+187, with 37 diagrams. Price 5s.]
- Autobiography of an Electron.** Charles R. Gibson, F.R.S.E. [London: Seely, Service & Co., 38, Great Russell Street, W.C.1. 1911. Pp. 215. Price 5s. net.]
- Calculation and Measurement of Inductance and Capacity.** W. H. Nottage, B.Sc. [London: The Wireless Press, Ltd., 12/13, Henrietta Street, W.C.2. 1916. Pp. 144. Price 3s. 6d.]
- Continuous Wave Wireless Telegraphy (Part I).** W. H. Eccles, D.Sc. [London: The Wireless Press, Ltd., 1921. Pp. vii+407, with 306 diagrams. Price 25s. net.]
- Decimal Tables.** Sir G. L. Molesworth, K.C.I.E., M.Inst.C.E. [London: E. and F. N. Spon, 57, Haymarket, S.W.1. 1919. Pp. 118. Price 2s. 6d.]
- Direction and Position Finding by Wireless.** R. Keen, B.Eng., A.M.I.E.E. [London: The Wireless Press, Ltd. Pp. 376. Price 9s.]
- Directive Wireless Telegraphy, Direction and Position Finding, etc.** L. H. Walter, M.A., A.M.I.E.E. [London: Sir Isaac Pitman & Sons, Ltd., 1921. Pp. xii+124, with 57 diagrams and illustrations. Price 2s. 6d. net.]
- Electric Discharges, Waves and Impulses and other Transients.** C. P. Steinmetz, A.M., Ph.D. [London: McGraw-Hill Publishing Co., Ltd. Second edition. Pp. 167, with 72 illustrations. Price 12s. 6d. net.]
- Electric Oscillations and Electric Waves.** G. W. Pierce, Ph.D. [New York: McGraw-Hill Book Co., Inc.; London: McGraw-Hill Publishing Co., Ltd. 6/8, Bouverie Street, E.C. 4. Pp. ix+517. Price 25s. net.]

- Electric Waves.** H. Hertz. (Translated by D. E. Jones, B.Sc.). [London: *Macmillan & Co., Ltd.*, St. Martin's Street, W.C.2. Second edition, 1900. Pp. 298. Price 12s. 6d.]
- Electrician's Handy Book.** T. O'Connor Sloane, A.M., E.M., Ph.D. [London: *Henry Frowde and Messrs. Hodder & Stoughton*. Fifth edition. 1920. Pp. 823. Price 27s. 6d. net.]
- Electron Theory of Matter.** O. W. Richardson. [London: *Cambridge University Press*, Fetter Lane, E.C.4. Price 21s.]
- Electromagnetic Theory.** O. Heaviside. [London: *Benn Bros., Ltd.*, reprinted 1922, 3 Vols. Price £5 5s.]
- Electromagnetic Theory of Light.** Part I. C. E. Curry, Ph.D. [London: *Macmillan & Co., Ltd.*, St. Martin's Street, W.C.2. Pp. 416. Price 12s.]
- Electron Theory: a Popular Introduction to the New Theory of Electricity and Magnetism.** E. E. Fournier-d'Albe, B.Sc. [London: *Longmans, Green & Co.*, 39, Paternoster Row, E.C.4. 1906. Pp. xxii+312. Price 7s. 6d.]
- Elements of Electromagnetic Theory of Light.** L. Silberstein, Ph.D. [London: *Longmans, Green & Co.*, 39, Paternoster Row, E.C. 1919. Pp. 48. Price 4s. 6d.]
- Elements of Radiotelegraphy.** Ellery W. Stone, Mem.I.R.E. [New York: *D. van Nostrand Co.* London: *Crosby, Lockwood & Son*, 7, Stationers' Hall Court, E.C. 1920. Pp. vii+267. Price 16s. 6d. net.]
- Elementary Lessons in Electricity and Magnetism.** Silvanus P. Thompson, D.Sc., F.R.S. [London: *Macmillan & Co., Ltd.*, St. Martin's Street, W.C.2. New edition—1915. Price 5s. 6d.]
- Elementary Manual of Radiotelegraphy and Radiotelephony for Students and Operators.** Dr. J. A. Fleming, F.R.S. [London: *Longmans, Green & Co.*, 39, Paternoster Row, E.C.4. Third edition—New impression, 1919. Pp. xiv+355, with 194 illustrations. Price 10s. 6d.]
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- Elementary Principles of Wireless Telegraphy.** Parts I and II. R. D. Bangay. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. 1918. Pp. 212. Price 4s. each; in 1 vol., 7s. 6d.]
- Elements of Electromagnetic Theory.** S. J. Barnett, Ph.D. [London: *Macmillan & Co., Ltd.*, St. Martin's Street, W.C.2. Price 12s. 6d. net.]
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- The Framework of Wireless Telegraphy: A New Theory of Electric Wave Sources and Propagation with Rational Applications.** R. C. Galletti di Cadillhac. [London: *Crosby Lockwood & Son*, 1921. Pp. 48, with 6 diagrams. Price 3s. 6d. net.]
- Handbook of Technical Instruction for Wireless Telegraphists.** J. C. Hawkhead. Revised by H. M. Dowsett, M.I.E.E. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. Second edition—Fifth impression, 1918. Pp. 344. Price 7s. 6d.]
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- Magnetism and Electricity for Home Study.** H. E. Penrose. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. 1918. Pp. 515. Price 6s.]
- Magnetism and Electricity for Students.** H. E. Hadley, B.Sc. [London: *Macmillan & Co.*, St. Martin's Street, W.C.2. Price 7s.]
- Maintenance of Wireless Telegraph Apparatus.** P. W. Harris. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. Second impression, 1918. Pp. x+127. Price 2s. 6d.]
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- Manual de Instrucción Técnica para Operadores de Telegrafía sin Hilos.** J. C. Hawkhead and H. M. Dowsett. Translated by C. Ortega. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. Pp. xvi+332. Price 9s. net.]

- Manual of Radiotelegraphy.** Captain S. S. Robison, U.S.N. [Annapolis, U.S.A.: *The United States Naval Institute*. London: *S. Rennell & Co., Ltd.*, 36, Maiden Lane, W.C.2. Fifth edition, 1919. Price 10s. net.]
- Marine Wireless Pocket Book.** W. H. Marchant. [London: *I. Pitman & Sons, Ltd.*, Parker Street, Kingsway, W.C.2.] *In the Press.*
- *Maxwell's Theory and Wireless Telegraphy.** H. Poincaré and F. K. Vreeland. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Price 10s. 6d.]
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- Plans and Specifications for Wireless Telegraph Sets.** Part II: Five to Ten Miles. [London: *E. and F. N. Spon, Ltd.*, 57, Haymarket, S.W.1. 1912. Pp. 72 with 62 illustrations. Price 2s. 6d. net.]
- Pocket Book (the Wireless Telegraphists') of Notes, Formulae and Calculations.** (Containing Formulae, Tables and Examples of Calculations Required in Practical Radiotelegraphy.) J. A. Fleming, M.A., D.Sc., F.R.S. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. 1915. Pp. 347. Price 9s.]
- Pocket Dictionary of Technical Terms Used in Wireless Telegraphy.** Harold Ward. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. New edition, 1919. Pp. 253. Price 2s. 6d.]
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- Practical Uses of the Wavemeter in Wireless Telegraphy.** J. O. Mauborgne, [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Pp. 74. Price 6s. 3d.]
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- Prepared Radio Measurements with Self-Computing Charts.** Ralph R. Batcher, E.E. [New York: *Wireless Press Inc.* London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. 1921. Pp. 132. Price 10. 6d. net.]
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- Principles of Radiotelegraphy.** C. M. Jansky. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Pp. 242, with 179 illustrations. Price 12s. 6d. net.]
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- Wireless Telegraphy.** Gustav Eichhorn, Ph.D. [London: Charles Griffin & Co., Ltd., 12, Exeter Street, W.C.2. 1906. Pp. x+116. Price 10s. 6d. net.]
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- Wireless Telegraphy.** J. Zenneck. Translated by A. E. Seelig, M.A.M.I.E.E. [London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Pp. 428, with 461 illustrations. Price 25s. net.]
- Wireless Telegraphy: With Special Reference to the Quenched Spark System.** B. Leggett, A.M.I.E.E. [London: Chapman & Hall, Ltd., 11, Henrietta Street, W.C.2. 1921. Pp. xv+385. Price 30s. net.]
- Wireless Telegraphy: A Handbook on the Fundamental Principles and Modern Practice of Radiotelegraphy for the use of Students of Electrical Engineering.** A. B. Rolfe-Martin. [London: A. & C. Black, Ltd., 4/6, Soho Square, W.1. 1914. Pp. 256. Price 3s. 6d.]
- Wireless Telegraphy and Telephony: An Outline for Electrical Engineers and Others.** L. B. Turner, M.A., M.I.E.E. [London: The Cambridge University Press. 1921. Pp. xii+195. Price 20s. net.]

- *Wonders of Wireless Telegraphy and Telephony.** Wm. J. White. [London: *I. Pitman & Sons, Ltd.*, Parker Street, Kingsway, W.C.2. Pp. 202. Price 4s.]
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- Wireless Telephone Construction.** Newton Harrison. [London: *E. and F. N. Spon, Ltd.*, 57, Haymarket, S.W.1. Pp. 74, with 43 illustrations. 1918. Price 2s. 6d.]
- Wireless Telephones and How They Work.** Dr. J. Erskine-Murray. [London: *Crosby, Lockwood & Son*, 7, Stationers' Hall Court, E.C.4. Pp. 76. Price 3s.]
- Wireless Time Signals.** [London: *E. and F. N. Spon, Ltd.*, 57, Haymarket, S.W.1. 1915. Pp. 132, with 30 illustrations and 1 plate. Price 5s.]
- Wireless Transmission of Photographs.** Marcus J. Martin. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2. Revised, 1919. Pp. xv+142. Price 5s.]
- Wonders of Wireless Telegraphy Explained in Simple Terms for the Non-technical Reader.** J. A. Fleming, M.A., D.Sc., F.R.S. [London: *Society for Promoting Christian Knowledge*, 6, St. Martin's Place, W.C.2. Second edition, revised. Pp. 280. Price 7s. 6d.]

GREECE.

- Elementary Treatise on Wireless Telegraphy.** Com. R. N. Gr. Mezeviris. [Publishers: *Government Press.*]
- Handbook of Wireless Telegraphy.** Vol. 2. Com. R. N. Gr. Mezeviris. [Publishers: *Government Press.*]

HOLLAND.

- De Internationale Organisatie van het Radio-electrische Verkeer.** G. F. van Dissel. [Leyden: *A. W. Sythoff's Uitgeversmaatschappij*. Pp. 48. Price fl. 0.50.]
- De Marconi Telegrafie.** H. O. Ruyter de Wildt.
- De theoretische grondslagen van Magnetisme en Electriciteit.** Dr. Ir. N. Koomans. [The Hague: *N. Veenstra*. Price fl. 3.50.]
- Draadlooze Telegrafie.** J. R. G. Isbrücker. [Rotterdam: *Nygh en Dilmar*, Second edition. Price fl. 1.90.]
- Draadlooze Telegrafie en hare toepassingen in Nederlandsch Oost-Indie.** M. F. Onnen. [Leiden: *E. J. Brill*.]
- Draadlooze Telegrafie.** Edw. Vosmaer. [Baarn: *V. d. Ven*. Price fl. 0.75.]
- Draadlooze Telegrafie en Telefonie.** N. Koomans. [Deventer: *Kluwer*. Price fl. 1.75.]

- Draadlooze Telegrafie over den Atlantischen Oceaen.** I. van Dam.
Handleiding voor de uitoefening van den Radiotelegraafdienst. A. Walrave.
 [W. Kruijt. Eighth edition. Price fl. 2.00.]
- Het draadloos amateurstation voor den ontvangst van telegrafie en telefonie.**
 J. Corver. [The Hague: N. Veenstra. Price fl. 3.75 and fl. 5.0.]
- Het draadloos zendstation voor den amateur.** J. Corver. [The Hague
 N. Veenstra. 1920. Pp. 106. Price fl. 3.60.]
- La Telegraphie sans Fil.** I. van Dam.
- Leerboek voor aans Radiotelegraafisten en Stuurleiden.** L. F. Steehouwer.
 [Noorduyn Gorinchern. Parts I and II. Pp. 136.]
- Onderzoekingen op het gebied van Radiotelegrafie in Nederlandsch Oost-Indie.**
 [s Gravenhage: Martinus Nyhoff. 1916. Three vols. Pp. 284. Price
 fl. 7.50.]
- Radiotelegraphie in de tropen.** Dr. C. J. de Groot. [The Hague: Veenstra.
 1916. Pp. 247. Price fl. 7.50.]
- Technische Handleiding voor Adspirant Radiotelegrafisten.** A. K. Damstra
 and A. Walrave. [Published by the Authors. Third edition. Price
 fl. 3.50.]

ITALY.

- Elementi di Telegrafia senza fili.** P. Barreca. [Leghorn: Raffaello Giusti.]
- Il Radiogoniometro e la Radiotelegrafia Direttiva.** [Rome: Ufficio Marconi.]
- La Telefonía senza fili.** Umberto Bianchi. [Milan: Ulrico Hoepli, Pp
 viii+296. Price L. 10.]
- L'Optica delle Oscillazioni Elettriche.** Augusto Righi. [Bologna: Nicola
 Zanichelli. Price L. 5.]
- Manuale pratico del radiotelegrafista.** G. Della Santa. [Milan: Ulrico
 Hoepli. Pp. 171. Price L. 6.50.]
- Nozioni Elementari di Radiotelegrafia.** [Rome: Ufficio Marconi.]
- Progressi e stato attuale della Telegrafia e Telefonía senza fili.** Giuseppe
 Vanni. [Rome: Fratelli Capaccini.]
- Radiotelegrafia e Radiotelefonía.** D. Mazzotto. [Milan: Ulrico Hoepli.
 Second edition. Price L. 6.]
- Radiotelefonía.** D. Ravalico. [Turin: S. Lattes. 1920. Pp. vii+219.
 Price L. 14.]
- Telegrafia senza fili.** O. Murani. [Milan: Ulrico Hoepli. Third edition.
 Pp. 520. Price L. 10.]

JAPAN.

- Japanese Wireless Year-Book.** Musen Nenkan. [Tokyo: Musen News
 Agency, 15, Sakuradabizencho, Shiba.]
- *Popular Wireless Telegraphy and Telephony.** Masajiro Kitamura and Eigoro
 Tsumori. [Tokyo: Hobunkan, Honkokucho Nihonbashiku. Price
 yen 4.5.]
- Principles of Wireless Telegraphy and Telephony.** Dr. Binnojo Mizuno.
 [Tokyo: Marzuen Co., Tori 3 Chome, Nihonbashiku. 2 vols. Price
 yen 5.5.]
- Stories of Wireless Telegraphy and Telephony.** Eitaro Yokoyama. [Tokyo:
 Denyusha, Minamikinrokuchō, Kyobashiku. Price yen 0.7.]
- Wireless Telegraphy.** Shunkichi Kimura. [Tokyo: Uchita Rokakuho,
 Otenmachi, Nihonbashiku. Price yen 2.0.]
- Wireless Telegraphy and Telephony.** Dr. Wichi Torikata. [Tokyo:
 Hobunkan, Honkokucho, Nihonbashiku. Price yen 5.500.]
- Besides these there are a number of reports on wireless operations
 published by the Electro-Technical Laboratory.

NORWAY.

- Elementær Radiotelegrafi.** (Handbook for Wireless Operators.) B. L.
 Gottwaldt. [Christiania: H. Aschehoug and Co. Second edition. 1918.
 Price kr. 5.00.]

- Instructions to Government Wireless Operators.** Issued by the Engineer in Charge of Wireless Section of the Norwegian Telegraph Department.
***Wireless Telegraphy Manual.** Captain Hovland. Issued for use in Norwegian Navy. 1907.

PORTUGAL.

- Biblioteca do Instrucao Profissional.** Elemento do Electricidade com um capitulo que trata de T.S.F. Ex. \$1.60.
Telegraphia Electrica Aeria Submarina e Sem Fios. B. Ferrini. Translated by Adalberto Veiga, 1919. Ex. \$1.00.
T.S.F. Mariotte. Ex. \$10.
T.S.F. Separata da Revista de Electricidade e mechanica. Ex. \$6.00.
T.S.F. G. Le Petit. Frs. 9.
T.S.F. Amadeus de Vasconcellos Porto, 1907. Ex. \$10.
Telegraphia Sem Fios Biblioteca do Poco e das Escolas. (1 pamphlet.) Ex. \$0.05.

SPAIN.

- Cartilla Para el Curso de Radiotelegrafia.** Luis Blanco and Gustavo de Montaud. [*Centro Electrotécnico de Ingenieros.* Sin precio.]
Estudio de la Recepción en las Radiocomunicaciones. J. Espinosa de los Monteros. [Madrid: *Ministerio de Marina.* 1919.]
El Entretenimiento de los Aparatos Radiotelegraficos. Percy W. Harris. [Madrid: *Prensa Radiotelegrafica*, (S.A.), Alcala 43.]
La Valvula Oscilatoria. R. D. Bangay. [Madrid: *Prensa Radiotelegrafica*, (S.A.), Alcala 43.]
Manual de Instruccion Tecnica para Operadores de Telegrafia sin Hilos. J. C. Hawkhead and H. M. Dowsett. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Pp. xvi+332. Price 11 pesetas.]
Notas Utiles : Corriente Alternativa. Harold E. Penrose. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 3.50 pesetas.]
Notas Utiles : Corriente Continua. Harold E. Penrose. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 3.50 pesetas.]
Notas Utiles : La Valvula Oscilatoria. Harold E. Penrose. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 3.50 pesetas.]
Notas Utiles : Produccion de Corrientes de Alta Frecuencia. Harold E. Penrose. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 3.50 pesetas.]
Notas Utiles : Tipo de Barco 1½ kW. Harold E. Penrose. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 3.50 pesetas.]
Principios Elementales de Telegrafia sin Hilos. R. D. Bangay. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 10 pesetas.]
Radiogoniometria y Recepción por cuadro. J. Espinosa de los Monteros. [Madrid: *Ministerio de Marina.* 1919.]
Radiotelefonía Espanola. Rufino Gea y Sacasa. [Madrid: *El Telegrafo Espanol.* Pp. 56. Price 4 pesetas.]
Telegrafia sin Hilos. Eugenio Agacino and Rancon Estrada. [Cadiz: *F. Rodríguez de Selve.* Price 8 pesetas.]
Telegrafia sin Hilos. E. Monier. [Price 3 pesetas.]
Telegrafia sin Hilos. Augusto Righi and Bernard Dessau. Translated from the German by Marqués de Magaz and D. Juan Rosell. [Madrid: *Ricardo Rojas, Campomanes* 8. Price 20 pesetas.]
Telegrafia sin Hilos. Francisco del Rio Joan. [Madrid: *Revista tecnica de Infanteria y Caballeria*, Passje de Valdecilla, 2. Price 9.50 pesetas.]
Telegrafia y Telefonía sin Hilos. F. Villaverde and Zubeldia. [Barcelona: *Calce.* Pp. 180.]

Teoria de Maxwell y las Oscilaciones Hertzianas. E. Poincaré. With Appendix, "Los Ultimos Adelantos de la Telegrafia sin Hilos," by P. H. Basauri, S.J. [Barcelona: *Tipografia Catolica Casals*, Caspe 108. Price 3 pesetas.]

Valvulas Termoionicas. Guillermo Ortega. [Madrid: *Prensa Radiotelegrafica* (S.A.), Alcala 43. Price 1.50 pesetas.]

SWEDEN.

Handbok i Radiotelegrafi. J. Gunnar Holmstrom. [Stockholm.]

Lärobok i Trädlös Telegrafi. F. Zethraeus.

Principiell Tramställning af Glödkatodrörens Veikningssätt samt användning vid Mottagning irom Radiotelegrafen af. Siffer Lemoine.

Trädlös Telegrafi. Thor Thörnblad.

SWITZERLAND.

Die moderne drahtlose Telegraphie : Demonstrationsvortrag. Dr. Gustav Eichhorn. [Zurich: *Institut Artistique Orell Fussli*. 1906. Pp. 27. Price 1.20 fr.]

Drahtlose Telegraphie im internen Recht und Völkerrecht. Dr. Fr. Meilo. [Zurich: *Institut Artistique Orell Fussli*. Price 4 fr.; cloth, 5 fr.]

UNITED STATES.

Alexanderson System for Radio Telegraph and Radio Telephone Transmission. Elmer E. Bucher. [New York: *The Wireless Press Inc.* London: *The Wireless Press, Ltd.* 1920. Pp. 55. Price 10s. 6d.]

Construction of a Trans-Atlantic Wireless Receiving Set. L. G. Pacent and T. S. Curtis. [New York: *Henley Publishing Co.*, 2, West 45th Street. Pp. 36. Price 35 cents.]

Directions for Designing, Making and Operating High-Pressure Transformers. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author*. Price 75 cents.]

Electric Discharges, Waves and Impulses and other Transients. C. P. Steinmetz, A.M., Ph.D. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Second edition. Pp. 167, with 72 illustrations. Price 12s. 6d. net.]

Electric Oscillations and Electric Waves. G. W. Pierce, Ph.D. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Pp. ix+517. Price 25s. net.]

Electricity at High Pressures and Frequencies. H. L. Transtrom. [Chicago: *The Joseph G. Branch Publishing Co.* Second edition. 1921. Pp. xi+247. Price \$2.50.]

Elements of Radiotelegraphy. E. W. Stone. [New York: *D. Van Nostrand & Co.*, 25, Park Place. Pp. 265. Price \$2.50.]

Engineering Mathematics. C. P. Steinmetz, A.M., Ph.D. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Third edition. Pp. 321. Price 17s. 6d. net.]

Examples in Alternating Currents. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author*. Price \$2.65.]

Examples in Magnetism. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author*. Price \$1.25.]

***Experimental Wireless Stations.** P. E. Edelman. [New York: *Henley Publishing Co.*, 2, West 45th Street. Pp. 320. Price \$3.00.]

Experiments with Alternate Currents of High Potential and High Frequency. Nikola Tesla. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. 1914. Pp. 174, with 42 illustrations. Price 5s.]

- Formulae and Tables for the Calculation of Alternating Current Problems.** Louis Cohen. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Pp. 282. Price 17s. 6d.]
- Generator and Motor Examples.** Professor F. E. Austin. [Hanover, N.H.: Published by the Author. Price \$2.75.]
- How to Conduct a Radio Club.** E. E. Bucher. [New York: Wireless Press Inc., 326, Broadway. 1919. Pp. 148. Price 75 cents.]
- How to Make Low-Pressure Transformers.** Professor F. E. Austin. [Hanover, N.H.: Published by the Author. Price 90 cents.]
- How to Pass U.S. Government Wireless License Examinations.** E. E. Bucher. [New York: Wireless Press Inc., 326, Broadway. Price 75 cents.]
- Induction Coils in Theory and Practice.** Professor F. E. Austin. [Hanover, N.H.: Published by the Author. Price \$1.25.]
- Laboratory Experiments with Direct Currents.** Professor F. E. Austin. [Hanover, N.H.: Published by the Author. Price \$1.75.]
- Manual of Radiotelegraphy and Telephony for the use of Naval Electricians.** S. S. Robison, U.S.N. With revisions and additions by Capt. D. W. Todd, U.S.N., and Lieut.-Commdr. S. C. Hooper, U.S.N. [Annapolis, Md.: The United States Naval Institute. Fifth edition, 1920. Pp. 307. Price \$2.50 net.]
- *Maxwell's Theory and Wireless Telegraphy.** H. Poincaré and F. K. Vreeland. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Price 10s. 6d.]
- Methods of Measuring Electrical Resistance.** E. F. Northrup, Ph.D. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Pp. 390. Price 22s. 6d.]
- Military Signal Corps Manual.** Major J. A. White. [New York: Wireless Press Inc., 326, Broadway. Price \$2.25.]
- Operators' Wireless Telegraph Handbook: Treatise on Construction and Operation of Wireless Telegraph and Telephone.** V. H. Laughter. [Chicago: F. J. Drake and Co. Pp. 180. Price \$1.25.]
- Practical Amateur Wireless Stations.** Compiled by J. Andrew White, Editor of the *Wireless Age*. [New York: The Wireless Press, Inc., 326, Broadway. Pp. 136. Price 75 cents.]
- Practical Uses of the Wave Meter in Wireless Telegraphy.** J. O. Mauborgne. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Pp. 74. Price 6s. 3d.]
- Practical Wireless Telegraphy.** E. E. Bucher. [New York: Wireless Press Inc., 326, Broadway. Pp. 352. Price \$2.25.]
- Preliminary Mathematics.** Professor F. E. Austin. [Hanover, N.H.: Published by the Author. Price \$1.25.]
- Prepared Radio Measurements with Self Computing Charts.** Ralph R. Batcher, E.E. [New York: Wireless Press, Inc. London: The Wireless Press, Ltd. 1921. Pp. 132. Price 10s. 6d. net.]
- Principles of Radio Communication.** J. H. Morecroft. Assisted by A. Pirito and W. A. Curry. [New York: John Wiley & Sons, Inc. Pp. xx+935. Price 45s. net.]
- Principles of Radiotelegraphy.** C. M. Jansky. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. Pp. 242, with 179 illustrations. Price 12s. 6d.]
- *Principles Underlying Radio-Communication.** Signal Corps, U.S.A. [Washington: Government Printing Office, 1919. Pp. 355. Price 55 cents. New edition in Preparation.]

- Radio Communication.** John Mills. [New York: McGraw-Hill Book Co. Inc. London: McGraw-Hill Publishing Co., Ltd., 6/8, Bouverie Street, E.C.4. 1918. Pp. 210. Price 10s. net.]
- Radio Engineering Principles.** H. Lauer, B.S., and H. L. Brown, B.E.E. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. Pp. xv+300 with 250 illustrations and 8 plates. Price 17s. 6d. net.]
- Radio Instruments and Measurements.** [New York: Wireless Press Inc., 326, Broadway. Pp. 320. Price \$1.75.]
- Radio-telephony.** Dr. A. N. Goldsmith, B.Sc., Ph.D. [New York: Wireless Press Inc., 326, Broadway. Pp. 256. Price \$2.50.]
- Radio Questions and Answers.** A. R. Nilson. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. 1922. Pp. 92. Price 5s. net.]
- Report of the Chief Signal Officer of the U.S. Army to the Secretary of War, U.S.A., 1920.** [Washington: Government Printing Office. 1920. Pp. 64.]
- Report of the Director of the Air Service to the Secretary of War, U.S.A.** [Washington: Government Printing Office, 1920. Pp. 49.]
- Telegraph Engineering.** E. Hausmann. [New York: D. Van Nostrand Co., 25, Park Place. Price \$3.00.]
- The Book of Wireless.** A. F. Collins. [New York: D. Appleton & Co., 29/35, West 32nd. Street. Pp. 222. Price \$1.50.]
- Theory and Calculation of Transient Electric Phenomena and Oscillations.** C. P. Steinmetz, A.M., Ph.D. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. Third edition. 1920. Pp. 696, with 113 illustrations. Price 30s. net.]
- The Consolidated Radio Call Book.** [New York: The Consolidated Radio Call Book Co. Inc. Second edition. 1920. Pp. 160. Price \$1.25.]
- The How and Why of Radio Apparatus.** H. W. Secor. [New York: Experimenter Publishing Co. Inc. Pp. 160. Price \$1.75.]
- The Thermionic Vacuum Tube and its Applications.** H. J. van der Bijl. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. 1921. Pp. 391, with 232 illustrations. Price 25s. net.]
- Vacuum Tubes in Wireless Communication.** E. E. Bucher. [New York: Wireless Press Inc., 326, Broadway. Pp. 202. Price \$2.25.]
- Wireless Experimenter's Manual.** E. E. Bucher. [New York: Wireless Press Inc., 326, Broadway. 1920. Pp. 335. Price \$2.25.]
- Wireless Telegraph Construction for Amateurs.** A. P. Morgan. [New York: D. Van Nostrand Co., 25, Park Place. Pp. 236. Price \$1.50.]
- Wireless Telegraphy: Its History, Theory and Practice.** A. F. Collins. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. Pp. 300 with 332 illustrations. Price 15s. net.]
- Wireless Telegraphy.** J. Zenneck. Translated by A. E. Selig, M.Am.I.E.E. [New York: McGraw-Hill Book Co., Inc. London: McGraw-Hill Publishing Co., Ltd. Pp. 428, with 461 illustrations. Price 25s. net.]
- *Wireless Telegraphy and Telephony.** C. I. Hoppough. [New York: Henley Publishing Co., 132, Nassau Street. Pp. 236. Price \$1.50.]
- Wireless Telegraphy and Telephony (Simply Explained).** A. P. Morgan. [New York: Henley Publishing Co., 2, West 45th Street. Pp. 154. Price \$1.50.]
- Wireless Telegraphy and Wireless Telephony.** A. E. Kennelly. [New York: D. Van Nostrand Co., 25, Park Place. Price \$1.25.]

(2) PERIODICALS.

ARGENTINA.

Revista Telegrafica. [Buenos Aires.] \$0.40 m.n. monthly.

AUSTRALIA.

Sea, Land and Air. [Sydney: *The Wireless Press*, 99, Clarence Street.] 1s. 3d. monthly. 15s. per annum.

BELGIUM.

Bulletin de la Société Belge des Électriciens. [Bruxelles: *Librairie Ramlo Frères et Sœur*, Rue Gretry 25.] Bi-Monthly. Price 4 fr.

L'Électricité pour Tous. [Laeken: *Henri Marchand*, 225, Boulevard Emile Bockstael.] 1 fr. Monthly. 10 fr. per annum. Outside Belgium 12 fr.

CANADA.

Canadian Wireless. [Montreal: 11, St. Sacrament Street, Montreal, P.Q.] Monthly. Price 10 cents.

The Journal of the Engineering Institute of Canada. [Montreal: *The Engineering Institute of Canada*, 176, Mansfield Street.] Monthly.

FRANCE.

Bulletin de la Société Française des Électriciens. [Paris: *Bureaux de la Revue Générale de l'Électricité*, 12, Place de Laborde.] Monthly. Price 8 fr.

Comptes Rendus hebdomadaires des Séances de l'Académie des Sciences. [Paris: *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] Weekly. 94 fr. per annum.

Génie Civil. [*M. Ch. Talansier*, 6, Rue de la Chaussée-d'Antin. Weekly 2 fr. Annually 70 fr. Outside France 85 fr.]

L'Électricien. [Paris: *H. Dunod*, 47 and 49, Quai des Grands-Augustins.] 1.25 fr., fortnightly; 23 fr. per annum France; 30 fr. per annum outside France.

L'Électricité. [Paris: *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] 1.50 fr. fortnightly; 25 fr. per annum France; 30 fr. per annum outside France.

La Nature. [Paris: *Masson et Cie*, 120, Boulevard Saint-Germain.] 1 fr. weekly; 40 fr. per annum France; 50 fr. per annum outside France.

L'Onde Electrique. Publication de la Société des Amis de la T.S.F. [Paris: *E. Chiron*, 40, rue de Seine. Price 3 fr. monthly.]

La Technique Moderne. [Paris: *H. Dunod*, 49, Quai des Grands-Augustins.] Monthly, 5 fr. 50 fr. per annum. Outside France 60 fr. per annum.

***L'Onde Hertzienne.** Bulletin Mensuel de la Société Française d'Etude de Télégraphie et de Téléphonie sans Fil. [Paris: *La Société Française d'Etude de Télégraphie et de Téléphonie sans Fil.*] Now amalgamated with *La T.S.F. Moderne*.

La T.S.F. Moderne. [Paris, VIIe: *La T.S.F. Moderne*, 11, Avenue de Saxe.] Monthly. Price, 2.50 fr., France; 3.50 fr., outside France. 24 fr. per annum France; 36 fr. per annum outside France.

L'Électricité Industrielle et Commerciale. [Paris: *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] Price, 1.50 fr., fortnightly; 25 fr. per annum, France; 30 fr. per annum, outside France.

Radioélectricité. [Paris, VIIIe: 12, Place de Laborde.] 3 fr. monthly; 30 fr. per annum; 36 fr., outside France.

Revue Générale de l'Électricité. [Paris, VIIIe: 12, Place de Laborde.] 3 fr. weekly; 75 fr. per annum, France; 90 fr. per annum, outside France.

****"T.S.F." Revue Mensuelle de Radiotélégraphie.** [Valenciennes: Edited by *G. Flayelle*, 36, Rue de Mons.] Publication suspended.

GERMANY.

- Annalen der Physik.** [Leipzig: J. A. Barth, 16, Dorrienstrasse.] Fortnightly: 3 vols. yearly. Each volume (8 numbers), £1 1s. per vol.
- Archiv für Post und Telegraphie.** [Berlin: Reichspostministerium.]
- Der Funker.** [Berlin: E. S. Mittler & Sohn.] Monthly.
- Elektrotechnische Zeitschrift.** [Berlin, W.9: J. Springer, 23, Linkstrasse.] Weekly. Price M. 60 per annum.
- Archiv für Elektrotechnik.** [Berlin, W.9: Verlag Julius Springer, 23, Linkstrasse.] Monthly. (12 parts per volume). Price M. 80 per vol.
- Jahrbuch Zeitschrift für drahtlose Telegraphie und Telephonie sowie des Gesamtgebietes der Hochfrequenztechnik.** Edited by Dr. E. Nesper. [Berlin, W.10: M. Krayn, 39, Genthiner Strasse.] Monthly. Price M. 80 per annum.
- Physikalische Zeitschrift.** [Leipzig: S. Hirzel, 2, Königstrasse.] Price M. 96 per annum, Germany; £1 16s. per annum, outside Germany.
- Telegraphen- und Fernsprech-Technik.** [Berlin, W.66: Richard Dietz.] Monthly. Price M. 10 per annum.
- Telefunken Zeitung.** [Berlin, S.W.10: Gesellschaft für drahtlose Telegraphie, 11, Hallesches Ufer 12/13.] Price variable.
- Verhandlungen der Deutschen Physikalischen Gesellschaft.** [Braunschweig: Verlag Vieweg & Sohn.] Monthly. Price M. 5 per annum.
- Zeitschrift für Technische Physik.** [Leipzig: Verlag Johann Ambrosius Barth, 16, Dorrienstrasse.] Monthly. Price M. 80 per annum; £1 10s. per annum outside Germany.
- Zeitschrift für Instrumentenkunde.** [Berlin: Verlag Julius Springer, 23, Linkstrasse.] Monthly. Price M. 80 per annum.
- Zeitschrift für Fernmeldetechnik Werk- und Gerätebau.** [München, N.W.2: R. Oldenburg, Glockstrasse 8.] Monthly. Price M. 9 per annum.

GREAT BRITAIN.

- Electrical Industries.** [London: Electrical Press, Ltd., 13/16, Fisher Street, W.C.1.] Price 2d. weekly.
- Electrical Review.** [London: The Electrical Review, Ltd., 4, Ludgate Hill, E.C.4.] Price 6d. weekly.
- Electrical Times.** [London: The Electrical Times, Sardinia House, Sardinia Street, W.C.2.] Price, 3d. weekly.
- Electrician.** [London: Benn Bros., Ltd., 8, Bouverie Street, E.C.4.] Price 6d. weekly.
- Electrics.** [London: The Electrical Press, Ltd., 13/16, Fisher Street, W.C.1.] Price 4d. monthly.
- Engineering.** [London: Engineering, 35/36, Bedford Street, W.C.2.] Price 1s. weekly.
- Engineering Review.** [London: The Electrical Press, Ltd., 13/16, Fisher Street, W.C.1.] Price 9d. monthly.
- Journal of the Institution of Electrical Engineers.** [London: E. and F. N. Spon, Ltd., 57, Haymarket, S.W.1.] Price 10s. 6d. monthly.
- Journal of the Royal Society of Arts.** [London: G. Bell & Sons, Ltd., York House, Portugal Street, W.C.2.] Price 1s. Weekly.
- Journal of the Wireless Society of London.** [London: The Wireless Press, Ltd., 12/13, Henrietta Street, W.C.2.] Price 1s. 6d. monthly.
- Nature.** [London: Macmillan & Co., Ltd., St. Martin's Street, W.C.2.] Price 1s. weekly.
- Philosophical Magazine and Journal of Science.** [London: Taylor & Francis, Red Lion Court, Fleet Street.] Price 5s. monthly.
- Proceedings of the Cambridge Philosophical Society.** [London: Cambridge University Press, Fetter Lane, London, E.C.4.] Price 8s. 6d. quarterly.

- Proceedings of the Physical Society of London.** [London: *Fleetway Press, Ltd.*, 3-9, Dane Street, High Holborn, London, W.C.1.] Price 6s. bi-monthly.
- Proceedings of the Royal Society, Section A.** [London: *Harrison & Sons, Ltd.*, 44-47, St. Martin's Lane, W.C.2.] Monthly. Price varies.
- Post Office Electrical Engineers' Journal.** [London: *The Electrical Review, Ltd.*, 4, Ludgate Hill, E.C.4.] Price 2s. quarterly.
- Science Abstracts.** [London: *Institution of Electrical Engineers*, Savoy Place, Victoria Embankment, W.C.2.] Price 2s. 6d. monthly.
- Telegraph and Telephone Journal.** [London: *Managing Editor*, G.P.O. North, E.C.1.] Price 4d. monthly.
- Transactions of the Royal Society, Section A.** [London: *Harrison & Sons, Ltd.*, 44-47, St. Martin's Lane, W.C.2.] Monthly. Price varies.
- Wireless World and Radio Review.** [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2.] Price 6d. weekly.

HOLLAND.

- Physica : Nederlandsch Tijdschrift voor Natuurkunde.** Edited by Drs. A. D. Fokker, E. Oosterhuis, and B. van der Pol. [Eindhoven: *Administratie van Physica*, Postbus 18.] Monthly. Fl. 7.50 per annum.
- Proceedings Kloninklijke Akademie van Wetenschappen te Amsterdam.** [Amsterdam: *Koninklijke van Wetenschappen*.]
- Radio-Nieuws.** The organ of the Nederlandsche Vereeniging voor Radiotelegrafie. [The Hague: *N. Veenstra*, Laan van Meerdevoort 30.] Published monthly. fl. 7.50 per annum for the Netherlands; fl. 8.50 per annum, outside the Netherlands.
- Tijdschrift van het Nederlandsch Radiogenootschap.** [Baarn: *Nederlandsch Radiogenootschap*, Oude Utrechtscheweg 8.]
- Tijdschrift voor Electrotechniek.** [The Hague: *N. Veenstra*, Laan van Meerdevoort 30.] Published monthly. fl. 8 per annum, Netherlands, fl. 10 per annum, outside Netherlands.

ICELAND.

- Elektron.** [Reykjavik: *Published by Society of Icelandic Telegraphists*.]

ITALY.

- Bollettino Radiotelegrafico Della R. Marina.** [Leghorn: *Istituto Elettrotecnico e Radiotelegrafico presso la R. Accademia Navale di Livorno*.]
- Bollettino Radiotelegrafico del R. Esercito.** [Rome: Published under the direction of Prof. G. Vanni, Direttore dell'Istituto Radiotelegrafico ed Elettrotecnico del Genio Militare.]
- L'Audion : Organo del Radio Club d'Italia.** Edited by On. V. Bianchi. [Firenze: *Rog. E. Pochini*, Via del Giglio, 6.] Twice monthly, L.40 per annum.
- L'Audion.** Organo del Radio Club d'Italia. [Firenze: *Via dell'Alloro* 19.] Twice monthly. L.40.
- L'Elettricista.** [Rome: *Via Cavour*, 110.] Fortnightly.
- L'Elettrotecnica.** [Milan: *L'Elettrotecnica*, Via San Paolo, 16] L. 2.50. Three issues monthly.
- Le Vie del Mare e dell'Aria.** [Italy: *Agenzia Radiotelegrafica*.] 2.50 fr. monthly; 20 fr. per annum.
- Telegrafi e Telefoni.** [Rome: *Direzione Generale Servizi Elettrici*, Via del Seminario.] Fortnightly.

JAPAN.

- Proceedings of the Physico-Mathematical Society of Japan.** [Tokyo: *Z. P. Maruya & Co., Ltd.*, Nihonbasi.] Monthly. Price yen 0.50.

NEW ZEALAND.

- The Katipo.** Official organ of the N.Z.P. and T. Officers' Association. Published monthly at Wellington.

RUSSIA.

Journal de Telegraphie et Telephonie sans Fil. [Published in Russian.]
[Nijnij Nowgorod: *State Radio Laboratory.*] Irregular.

SPAIN.

***Aire Mar y Tierra.** [Madrid: *Preusa Radiotelegrafica* (S.A.) Alcala 43.]
rs. monthly.

SWITZERLAND.

Journal Télégraphique. [Berne: *Bureau International de l'Union Télégraphique.*] 0.6 fr. monthly; 5.40 fr. per annum; 6.00 fr. per annum, outside Switzerland.

UNITED STATES OF AMERICA.

Electrical Review (Chicago). [Chicago: 542/53, Manadnock Block.] Published weekly. \$3 per annum (\$6 Europe).

Electrical World. [New York: Tenth Avenue, at 36th Street.] Weekly, 15 cents.

***Everday Engineering Magazine.** [New York: *Everyday Mechanics, Inc.*, 2, West 45th Street.] *Publication suspended.*

General Electric Review. [Schenectady, New York: *The General Electric Co.*] Published monthly. \$2 per annum.

Journal of the American Institute of Electrical Engineers. [New York: *Published by the Institute*, 33, West 39th Street.] Published monthly. \$12 per annum.

Journal of the Franklin Institute. [Philadelphia: *Franklin Institute of the State of Pennsylvania.*] 50 cents monthly; \$5 per annum.

Journal of the Washington Academy of Sciences. [Washington: *R. L. Farie*, Treasurer, Coast and Geodetic Survey.] Twice monthly except July, August and September, when monthly, \$6 per annum.

Popular Science Monthly. [New York: 225, West 39th Street.] \$3 per annum.

Proceedings of the Institute of Radio Engineers. [New York: *The Institute of Radio Engineers*, College of the City of New York, 140th Street.] Bi-monthly. \$9.60 per annum.

Proceedings of the Radio Club of America. [Published by *The Radio Club of America.*] Irregular.

Q.S.T. [Hartford, Conn.: *The American Radio Relay League, Inc.*] 20 cent. monthly; \$2.00 per annum; \$2.50 per annum outside U.S.A.

Radio and Model Engineering. [New York City: *The General Apparatus Co., Inc.*, 570, West 184th Street.] 10 cents. monthly; \$1.00 per annum.

Radio Telegrapher. [New York: *The National United Radio Telegrapher's Association*, 44, Broad Street.] Monthly 15 cents. \$1.50 per annum.

Radioist. [Omaha: *International Society of Radioists*, Executive Headquarters.]

Radio News. [New York: *Experimenter Publishing Co.*, 233, Fulton Street.] Published monthly. \$2 per annum; \$2.50, outside U.S.A.

Science and Invention (formerly "Electrical Experimenter"). [New York: *Experimenter Publishing Co.*, 233, Fulton Street.] Published monthly. \$3 per annum; \$3.50 outside U.S.A.

Scientific American. [New York: 233, Broadway.] Monthly 35 cents; \$4.00 per annum.

Telegraph and Telephone Age. [New York: 253, Broadway.] Published twice monthly. \$2 per annum; foreign postage, \$1 extra.

Wireless Age. [New York: *Wireless Press, Inc.*, 326, Broadway.] 25 cents monthly; \$2.50 per annum; \$3, outside U.S.A.

AMATEUR AND EXPERIMENTAL

- (A) Résumé of Progress of Amateur and
Experimental Wireless
- (B) Directory of Wireless Societies of the
World
- (C) Call Signs of British Experimental
Stations
- (D) Regular Transmission

AMATEUR AND EXPERIMENTAL WIRELESS

By HUGH S. Pocock, Editor of *The Wireless World and Radio Review*.

IN the following article it is proposed to give a *résumé* of wireless activities in the amateur field during the year 1922, with special reference to Great Britain, whilst elsewhere in this volume there appears an account of the work done in the way of commercial developments in wireless telegraphy and telephony.

Certainly many progressive steps have been made in all branches of the science during the year 1922, and the amateur has shared in these developments, whilst at the same time consolidating his position and assuring his status with the Authorities in whose hands is vested the control of the licenses under which the experimenter enjoys privileges.

The most progressive step taken in this country during the past year is undoubtedly the introduction of the scheme for Broadcasting by wireless and the amateur may reasonably claim the honour of having, to some extent, "promoted" broadcasting in this country through a Petition made to the Authorities by all the principal Wireless Societies of the United Kingdom headed by the Wireless Society of London (now the Radio Society of Great Britain), for authority to be given for a regular transmission of telephony once a week. This Petition was presented to the Post Office Authorities in December, 1921. Within a fortnight the necessary permission was granted and transmissions started from the station of the Marconi Scientific Instrument Company at Writtle, near Chelmsford.

These transmissions may therefore be regarded as the first official Broadcasting to be conducted in the United Kingdom.

The first announcement regarding the proposals for extensive Broadcasting was made just three months later by the Postmaster-General in the House of Commons. At the time of writing, after a series of delays, the Broadcasting service has commenced and one by one the various stations which are to conduct transmissions from eight different centres are opening up.

An enormous increase in public interest in wireless has resulted, partly from the direct appreciation of the possibilities of Broadcasting and partly owing to the publicity which has been given to the subject drawing the interest of many persons to the fascinating possibilities of wireless as a hobby, and as a subject for investigation quite apart from Broadcasting.

Broadcasting has, however, brought with it certain problems which have claimed the attention of the amateur as well as the professional, particularly in respect to the amateur who is licensed to transmit. The wavelengths authorised for the Broadcast transmissions are very close to the wavelength of 440 metres which hitherto has been the principal wavelength on which amateur transmissions have been conducted. This has virtually necessitated the confinement of amateur transmissions to much shorter wavelengths authorised as an alternative to the 440 metre wave.

This matter was the subject of meetings of transmitting license holders in the London area, called by the Radio Society of Great Britain towards

the end of 1922, when certain proposals for regulating amateur transmissions were adopted including the abolition of spark and tonic train transmissions by amateurs.

Transmission tests between British and American Amateurs have again during 1922 attracted a great deal of interest. In 1921, it will be remembered, successful reception by British amateurs was made of American amateur transmissions on short wavelengths and with power limited to 1 kW. output. On that occasion Mr. Paul F. Godley, an American amateur, was sent over here to attempt to receive the American stations on American apparatus. He, together with a number of British amateurs, was successful.

In 1922, in addition to further efforts to receive American transmissions, certain British amateur transmitting stations also made the attempt to bridge the Atlantic. At the time of writing, a very large number of American amateur stations have again been heard on this side, and the transmissions from this side have also met with success.

What is even more remarkable an achievement than the transatlantic transmission of amateur stations transmitting continuous wave, is the fact that early in December a report was made by a British amateur of the reception of the American telephony Broadcasting station of Newark, New Jersey. This first report was quickly followed by a very large number of others, some amateurs being able to give details of the entire Broadcast programme of Newark and other American stations. Considering that the Broadcast stations on the other side are not licensed to use excessive power, these results are truly remarkable. So many reports have been made and verified that these results can no longer be regarded as "freak" receptions.

As regards technical developments in amateur wireless in this country two lines of research have perhaps received special attention. These are, small power telephony transmitters and practical developments in high frequency amplification. Whereas during 1921 there were comparatively few amateurs conducting successful experiments in telephony, now nearly all the amateurs who have experimental licenses have forsaken Morse transmissions in favour of telephony which presents so much wider a field for investigation. The other subject which has attracted the attention of the serious experimenter, viz :—high frequency amplification dates, so far as the general amateur in this country is concerned, from the period of preparation for the Transatlantic tests in 1921. It is not suggested, of course, that prior to this date the amateur was unacquainted with amplification at radio frequency, but at the same time such circuits had not been in very general use. The necessity for radio frequency amplification was not so apparent until it became a question of the reception of very weak signals. At present there is perhaps a better practical acquaintance with such circuits amongst the more advanced amateurs in this country than can be shown anywhere else except by those professionally engaged in the design of apparatus.

The number of stations licensed for experimental work and for transmission has increased enormously during 1922. An idea of this increase may be gauged by a comparison of the list of transmitting stations published in this volume with the corresponding list in the last volume, yet even this list does not give all those licensed to transmit since many station owners prefer to withhold the permission necessary for particulars to be published. A year ago a rough estimate was made of the stations licensed in this country for experimental work. The figures arrived at showed 250 transmitting stations and about 6,000 receiving stations. To-day a very conservative estimate would give the number of transmitting stations as 700, whilst the receiving stations licensed for experimental work amount probably to at least 30,000, without taking into account the stations licensed for Broadcast reception only.

Further evidence of the development of amateur wireless in Great Britain is obtainable from records of the Radio Society of Great Britain. As the Wireless Society of London there were affiliated to this body at the end of 1921 approximately 60 local wireless societies. At the present time there are upwards of 150 Societies united in this way, and the membership of all the societies continues to increase with astonishing rapidity.

The Transatlantic Tests have shown what is possible in the way of long distance communication by amateurs with small power. In France during the past year facilities have been given by the Government for the establishment of experimental stations and two way communication has been conducted without any difficulty between stations in this country and France at as great a distance as Nice. From Italy, Scandinavia and Germany also reports are made of reception of transmissions by British Amateurs, although the majority of these transmitters are only licensed for the small power of ten watts.

In view of these achievements it is not surprising that the amateur has earned for himself public recognition and support. As a culminating mark of distinction H.R.H. the Prince of Wales has shown his interest by becoming the Patron of the Radio Society of Great Britain. The Society is thereby more than ever in a position to support the interests of the amateur and voice his feelings and wishes whenever collective effort is required in any representations to the authorities controlling the terms of licenses. "Unity is strength" is an ancient saying but it nevertheless applies to the most modern of sciences particularly where the interest of the amateur is concerned. Through joining a Society the amateur takes the best course in ensuring his position, for the Societies acting in concord and headed up by the Radio Society of Great Britain have a very strong voice in the management of affairs which intimately concern each individual amateur.

DIRECTORY OF THE WIRELESS SOCIETIES OF THE WORLD

THE following list has been brought as up-to-date as circumstances would allow. Wireless Societies, however, are constantly being formed, and it is possible that particulars may have been received too late for insertion. Every endeavour has been made to present a thoroughly reliable list, but no responsibility can, however, be accepted for any possible inaccuracies.

ARGENTINE.

Radio Club, Argentine—Belgrano 1732 Buenos Aires.

AUSTRALIA.

New South Wales Radio Association—*Sec.*, Lt. O. F. Mingay, Kuringgai Chase Road, Turramurra, Sydney.

Technical High School Wireless Club, Sydney.

Wireless Institute of Australia (New South Wales Division)—*Pres.*, E. T. Fisk; *Hon. Sec.*, Malcolm Perry, Box 2, King Street Post Office, Sidney, N.S.W. Tels., City 7349, Randwick 93.

Wireless Institute of Australia (South Australian Division)—Adelaide: *Pres.*, Hambly Clark; *Hon. Sec.*, C. E. Ames. Age limit 16 years. Annual sub., 10s. 6d., payable half-yearly. Official Organ, *Sea, Land and Air*.

Wireless Institute of Australia (Victorian Division)—*Pres.*, Major W. J. Sheldon; *Hon. Sec.*, Capt. Roach-Pierson, Melbourne, Victoria.

Wireless Institute of Australia (West Australian Division)—*Pres.*, W. E. Coxon; *Hon. Sec.*, G. W. Dean, 27, Holyrood Street, West Leederville, Perth.

BELGIUM.

†*Affiliated with S.F.E., T.S.F.*

Antwerp Section—*Sec.*, M. A. Wust, A.C.G.I., 128, Avenue du Margrave, Antwerp.

Cercle Anversois d'Etudes de T.S.F.—70 Rue Solvibus, Antwerp.

†Cercle Belge d'Etudes Radiotélégraphiques—*Sec.*, M. de Wouters, 16, Rue Pléinckx, Brussels. Official Organ, *La T.S.F. Moderne*.

Radio Club de Bruxelles, M. Delvigne.

Radio Club de Belgique. Official Organ, *L'Electricité pour Tous*. 20, Rue du Canal, Brussels.

CANADA.

**Affiliated with the American Radio Relay League.*

*Amateur Radio Club of Vancouver—*Sec.*, L. H. McKay, 536, 8th Avenue W., Vancouver, B.C.

Montreal Radio Association, D. R. P. Coates, c/o Scientific Experiments, Ltd., 33, Magill College Avenue, Montreal, Canada. Annual membership fee \$2.00. Meetings held first Wednesday in each month at Mechanics Institute.

*Ottawa Amateur Radio Association—*Sec.*, A. R. Gladden, 405, Wellington Street, Ottawa, Ontario, Canada.

Radio Club of Winnipeg—Kelvin Technical High School. *Hon. Pres.*, J. M. F. Wilson, B.Sc.; *Pres.*, J. R. Foster; *Sec. and Treas.*, E. A. Strong, Winnipeg. Number of Scholars: 40.

Regina Amateur Radio Association—*Hon. Sec.*, H. Miller, 2226, Searle Street, Regina, Sask.

The Radio Research Club of Canada—*Sec. and Treas.*, C. A. Culver, Ph.D., Hydro Electric Laboratories, 8, Strachan Avenue, Toronto, Ontario, Canada.

*Southern Ontario Radio Association—*Sec.*, D. Aitchison, 450, Janette Avenue, Windsor, Ontario, Canada.

The Hub City Radio Club (Saskatoon, Canada)—*Sec.*, Wm. Astin, 1312 Avenue C. North, Saskatoon, Sask., Canada.

The Sunday Leader Radio Club—*Sec.*, C. H. Starr, Windsor, Nova Scotia, Canada.

*Wireless Association of Ontario—*Sec.*, Wm. F. Choat, 241, Robert Street, Toronto, Canada.

CEYLON.

Ceylon Wireless Club—*Hon. Sec.*, J. S. Dinwiddie, 10, Queen Street, Colombo.

CHECHOSLOVAKIA.

Radio Club Chechoslovakia—*M.* Franta Stepanck, Phara III, Lazenska 6—III.

DENMARK.

Radiotelegrafist foreningen af 1917 (Skandinavisk) Copenhagen—Car Johansgade, 14—*Sec. and Treas.*, R. Rasmussen. Formed September 8th, 1917.

FRANCE AND ALGERIA.

‡ *Affiliated with S.F.E., T.S.F.*

Association des Anciens Radios de 8e Génie—*Hon. Prés.*, M. le Général Ferrié; *Pres.*, M. Alain-Charles Boursin; *Sec.*, M. J. Raynaud, 230, Fbg. St. Martin, Paris.

Association Radiotelegraphique D'Auvergne—*M.* Rob Trésorier, Faculté des Sciences, Clermont Ferraud, Puy de Dôme.

Club Radio des Patronages Parisiens (C.R.P.P.)—*Sec.*, Monsieur A. Bonniere, 301, Rue Lecourbe, Paris.

‡ La Radio Savoyarde—*Tres.*, M. Ritz, Caisse d'Epargne d'Annecy Haute Savoie.

L'Antenne—Société d'Amateurs de T.S.F.—*Pres.*, M. Cousin, Mairie de Sartrouville, Seine et Oise.

Les Radios de la Seine (Société des Preparation Militaire), 36, Rue Mon-Galette, Paris, XIIe.

‡ Radio Association Compiègnoise—*Sec.*, M. Bornot, III Rue de Paris, Compiègne Oise.

‡ Radio Club Agenais—*Sec.*, M. J. de Sevin, Pont de Pierre, Lot et Garonne.

‡ Radio Club of Algeria—*M.* Gola, 8 bis Boulevard Victor Hugo, Algiers.

Radio Club du Midi—*Sec.*, Ch. Conston, 13, Allee Léon Gambetta, Marseille, Bouches du Rhône.

Radio Club de Versailles—*M.* F. Simon, Ingénieur-electricien, 1, Rue du Maréchal Joffre, Versailles (Seine-et-Oise).

Radio Club Belfortain—*Pres.*, Monsieur Ch. Wandres, 31, Rue de Mulhouse, Belfort.

Radio Club de Bordeaux—*Sec.*, Monsieur M. Meunier, 90, Rue Paul Camelle, Bordeaux, Gironde.

Radio Club Bordelais—20, Cours Pasteur, Bordeaux.

Radio-Association Liancourt—*Sec.*, M. Pierre Douvry, 4, Rue des Arts et Métiers, Liancourt (Oise).

Radio Club Bourguignon—*Sec.*, M. Godenèche, 22, Rue Charrue Dijon, Cote D'Or.

Radio Club d'Anjou—19, Rue de Republique, Angers, Main et Loire.

†Radio Club de l'Aube (affilié à la SFE., TSF.)—*Sec.*, M. Algret, Café de la Ville, à Troyes Aube.

Radio Club de la Cote d'Azur (Nice)—M. Frégard, 11, Rue Francois, Guisol, Nice, Alpes Maritimes.

†Radio Club Dauphinois—*Sec.*, M. J. Bastide, 44, rue Lesdiguières, à Grenoble (Isère).

Radio Club de Douai—8, rue Fortier à Douai—*Pres.*, M. Bouly de Lesdain, Ingénieur, E.C.P. *Sec.*, M. Heinisch, Ingénieur, E.C.P.

†Radio Club de Lyon—M. Reynard, 1, Rue Camille Jordan, Lyon, Rhône.

†Radio Club de Metz—*Pres.*, M. Golopin, Meeting Place, Café Central, Place d'Armes à Metz.

†Radio Club des Patronages de Paris—301, Rue Lecourbe, Paris 15^e.

†Radio Club du Nord de la France—*Sec.*, Monsieur Bernast, 55, Rue Naue, Roubaix, Nord.

†Radio Club de Normandie—M. Restout, 8, Rue de la Haie, Boisguillaume, Seine-Inférieure.

†Radio Club de L'Ouest—M. Lardry, 61, Boulevard Négrier, Le Mans Sarthe.

Radio Club pour le Centre—*Sec.*, M. Marius Thouvais, la Ferté, Saint Cyr (Loir-et-Cher).

†Radio Club Nanceien—M. Doidic, 22, Rue Palissot, Nancy, Meurthe et Moselle.

Rouen Section—*Sec.*, Monsieur A. Restout, 8, Rue de la Haie, Boisguillaume (Pres. Rouen).

†Radio Club de Reims—M. de la Morinerie, Foyer Civil, Reims, Marne.

†Section Scolaire du Lycée Henri IV—M. Nérinée, 15, Rue de Médecis, Paris.

†Section de T.S.F. du Club D'Aviation de Valenciennes—36, Rue de Mons, Valenciennes, Nord.

Société Amicale des Anciens Elèves de l'Ecole Communale de Garçons de Sannois (La Semeuse), Seine et Oise. Groupe Radio—*Pres.*, M. Lemonnier, Official Organ, Le T.S.F. Moderne.

†Société Caennaise de T.S.F.—M. Jeanne, 263, Rue Sainte-Jean Caen, Calvados.

†Société Havraise de T.S.F.—56, Rue du Lycée, Le Havre, Seine-Inférieure.

†Société Nantaize de T.S.F.—*Sec.*, M. Fonterreau, 19, Rue Contresarpe, Nantes, Loire-Inférieure.

Société Ardennaise de Radiotélégraphie—Monsieur M. Thirriot, 6, Bord des deux Villas, Charleville, (Ardennes).

Société de Radiotélégraphie et de Preparation Militaire (S.R.P.M.)—*Pres.*, Monsieur J. E. Lavigne, 44, Rue Gay Lussac, Paris.

Société de T.S.F. de Grenoble—M. J. Bastide, 1, Rue Lakanal, Grenoble, Isère.

Société Française d'Etude de Télégraphie et de Téléphonie sans Fil (S.F.E.T.S.F.)—*Sec.*, Monsieur Roussel, 12, Rue Hoche, Juvisy (Seine et Oise). Official Organ, *La T.S.F. Moderne*.

†Société Provençale de T.S.F.—*Sec.*, Monsieur Seksik, 47, Rue Reinard, Marseilles.

†Société Quimpéroise d'Electricité et de T.S.F.—*Sec.*, Monsieur Picquenard, 19, Rue de Brest, Quimper, Finistère.

Société Française Radio Sport—*Pres.*, R. Bourgnignon, 152, Avenue de Wagram, Paris (XVIIe).

Société des Amis de la T.S.F.—*Pres.*, M. de Valbreuze. Société de Photographie, 51, Rue de Clichy, Paris.

†Société Renmaise de T.S.F.—*Sec.*, A. Cremailh, 15, Rue de Vitre, Rennes, Ile et Vilaine.

Union des Sociétés de T.S.F. de France (S.F.E., T.S.F.), founded in 1914.
Pres., Dr. Fanchette, 7 Rue d'Athènes, Paris 7^e. *General Sec.*, J. Poussel,
 12, Rue Hoche Juvisy. Official organ, *La T.S.F. Moderne*, 11, Avenue de
 Saxe, Paris 7^e.

GREAT BRITAIN.

† *Affiliated with the Radio Society of Great Britain.*

The Radio Society of Great Britain—*Patron*, H.R.H. The Prince of Wales.
Pres., W. H. Eccles, D.Sc., A.R.C.S., M.I.E.E., F.R.S. *Hon. Sec.*, L. McMichael,
 M.I.R.E., 32, Quex Road, West Hampstead, London, N.W.6. Tel., Hamp-
 stead 8777. Meetings, fourth Wednesday in month, at Institution of
 Electrical Engineers, Victoria Embankment. Official Organ, *The Wireless
 World and Radio Review*.

†Aberdeen and District Wireless Society—*Hon. Sec.*, 148, Forest Avenue,
 Aberdeen.

Ashton-under-Lyne and District Radio Society—*Hon. Sec.*, 22, Warrington
 Street, Ashton-under-Lyne.

†The Ayr Wireless Society—*Hon. Sec.*, 24, Marchfield Road, Newton-on-
 Ayr, N.B.

Battersea and District Radio Society—*Hon. Sec.*, 66, Newland Terrace,
 Queen's Road, S.W.8.

†Bedford Physical and Radio Society—*Hon. Sec.*, "Beechcroft," Beverley
 Crescent, Bedford.

†Belvedere and District Radio and Scientific Society—*Hon. Sec.*, 1, Kentish
 Road, Belvedere, Kent.

†Birkbeck College Wireless Society—*Hon. Sec.*, Bream's Buildings, Fetter
 Lane, E.C.4.

Radio Society of Birkenhead—*Hon. Sec.*, 35, Fairview Road, Oxton,
 Birkenhead.

†Birmingham Experimental Wireless Club—*Hon. Sec.*, Shadwell Street,
 Birmingham.

†Bishop's Stortford and District Amateur Wireless Association—Halfacres,
 Bishop's Stortford, Herts.

Blackburn and District Radio and Scientific Society—*Hon. Sec.*, Spring
 Bank, Limefield, Blackburn.

†Blackpool and Fylde Wireless Society—*Hon. Sec.*, 6, Seventh Avenue,
 South Shore, Blackpool.

†Boots Radio Society—*Hon. Sec.*, Welfare Department, Boots, Station
 Street, Nottingham.

†Bradford Wireless Society—*Hon. Sec.*, 85, Emm Lane, Bradford.

†Bristol and District Wireless Association—*Hon. Sec.*, 10, Priory Road,
 Knowle, Bristol.

†The Brighton and Hove Radio Society—*Hon. Sec.*, 52, Southdown Avenue,
 Brighton.

†Bromley Radio and Experimental Society—*Hon. Sec.*, 26, Wendover
 Road, Bromley, Kent.

†Radio Club de Brussels—*Mons. le Secrétaire*, 26, Rue de la Croix de Fer,
 Brussels, Belgium.

Burnham, Highbridge and District Wireless Society—*Hon. Sec.*, 52, High
 Street, Burnham-on-Sea.

†Burton-on-Trent Wireless Society—*Hon. Sec.*, 66, Edward Street, Burton-
 on-Trent.

†Cambridge University Wireless Society—*Hon. Sec.*, Clare College,
 Cambridge.

†Cambridge University Wireless Society—*Hon. Sec.*, 4, Rose Crescent,
 Cambridge.

†Cardiff and South Wales Wireless Society—*Hon. Sec.*, 37, Colum Road,
 Cardiff.

- †Cheltenham and District Wireless Association—*Hon. Sec.*, 28, Milton Road, Cheltenham.
- Chorleywood and District Wireless Society—*Hon. Sec.*, "Hillbrow," Haddon Road, Chorleywood.
- †City and Guilds Wireless Society—*Hon. Sec.*, City and Guilds Engineering College, Exhibition Road, London, S.W.7.
- †Clapham Park Wireless Society—3, Fontenoy Road, Bedford Hill, S.W.12.
- †The Corinium Wireless Society—*Hon. Sec.*, The Old Vicarage, Cirencester.
- †Coventry and District Wireless Association—*Hon. Sec.*, 44, Northumberland Road, Coventry.
- †Cowes District Radio and Research Society—1, Mill Hill Road, Cowes.
- †Croydon Wireless and Physical Society—*Hon. Sec.*, "Meadmoor," Brighton Road, Purley, Surrey.
- †Dartford and District Wireless Society—*Hon. Sec.*, 84, Hawley Road, Wilmington, Dartford.
- †Darwen Wireless Society—*Hon. Sec.*, 8, Hawkshaw Avenue, Darwen.
- †Derby Wireless Club—*Hon. Sec.*, "The Limes," Chellaston, Derby.
- Dewsbury and District Wireless Society—*Hon. Sec.*, 1 Ashworth Tce., Dewsbury.
- †The Dick Kerr Wireless Society—*Hon. Sec.*, Ashton Park, Ashton-on-Ribble, Preston.
- †The Durham City and District Wireless Club—*Hon. Sec.*, 3, Sowerby Street, Sacriston, Durham.
- †Ealing and District Radio Society—*Hon. Sec.*, 52, Uxbridge Road, Ealing, W.5.
- †East London Radio Society—King George's Hall, East India Dock Road, E.14.
- Eastern Enfield Wireless and Experimental Society—*Hon. Sec.*, 315, High Road, Ponders End, N.
- †Edinburgh and District Radio Society—*Hon. Sec.*, 9, Ettrick Road, Edinburgh.
- †Exeter and District Wireless Society—22, South View Terrace, Heavitree, Exeter.
- †Finchley and District Wireless Society—*Hon. Sec.*, "Elidor," 28, Holmwood Gardens, Church End, Finchley, N.3.
- Finsbury Technical College Wireless Society—*Hon. Sec.*, Leonard Street, City Road, E.C.4.
- †The Folkestone and District Wireless Society—8, Longford Terrace, Folkestone.
- †Société Française d'Etude de Télégraphie et de Téléphonie, S.F.—*Mons. le Secrétaire*, 12, Rue Hoche, Juvisy, Seine-et-Oise, France.
- †Fulham and Chelsea Amateur Radio and Social Society—*Hon. Sec.*, 48, Hamble Street, Fulham, S.W.6.
- †The Fulham and Putney Radio Society—*Hon. Sec.*, 52, North End Road, West Kensington, W.
- †The Glasgow and District Radio Club—*Hon. Sec.*, 93, Holm Street, Glasgow.
- †Glevum Radio and Scientific Society—*Hon. Sec.*, 43, Central Road, Gloucester.
- †Gloucester Wireless and Scientific Society—*Hon. Sec.*, 1, Jersey Road, Gloucester.
- †Greenwich Wireless Society—*Hon. Sec.*, 39, Bargery Road, Catford, S.E.
- †Wireless Society of Greenwich—*Hon. Sec.*, 18, Blackheath Rise, S.E.
- Guildford and District Wireless Society—46, High Street, Guildford.
- †The Hackney and District Radio Society—*Hon. Sec.*, 48, Dagmar Road, E.9.
- †Halifax Wireless Club—*Hon. Sec.*, Y.M.C.A., Clare Hall, Halifax.
- †Hamilton and District Radio Society—22, Dalziel Street, Hamilton, N.B.

- Harrogate and District Radio Society—Central Club Rooms, Beulah Street, Harrogate.
- Hartlepoons and District Wireless Society—*Hon. Sec.*, The Technical College, Hartlepool.
- Heckmondwike and District Wireless Society—Longfield Road, Heckmondwike.
- †Radio Society of Highgate—*Hon. Sec.*, 49, Cholmeley Park, Highgate, N.6.
- Hornsey and District Wireless Society—134, Inderwick Road, Hornsey, N.8.
- Horwich Radio Society—51, Mary Street, E. Horwich, near Bolton.
- †Hounslow and District Wireless Society—*Hon. Sec.*, 20, Standard Road, Hounslow.
- †Huddersfield Radio Society—*Hon. Sec.*, 14, John William Street, Huddersfield.
- †Wireless Society of Hull and District—*Hon. Sec.*, 79, Balfour Street, Hull.
- Hull Technical College Wireless and Scientific Club, 46, Auckland Avenue, Newland, Hull.
- †Segretario Generale del Radio Club (Ing. Antonio Labrance)—Via Muzio Clementi 77, Rome, Italy.
- †Ilford and District Radio Society—*Hon. Sec.*, 77, Khedive Road, Forest Gate, E.7.
- †Ilkley and District Wireless Society—*Hon. Sec.*, Lorne House, Richmond Place, Ilkley.
- Ipswich and District Wireless Club—*Hon. Sec.*, 46, Foundation Street, Ipswich.
- †Kensington Wireless Society—*Hon. Sec.*, W. J. Henderson, Esq., 2, Hollywood Road, South Kensington, S.W.10.
- Kingston and District Radio Society—*Hon. Sec.*, 57, High Street, Hampton Wick, Middlesex.
- Lambeth Field Club and Morley College Scientific Society—*Hon. Sec.*, Physics Laboratory, Morley College, Waterloo Bridge Road, S.E.1.
- †Leeds and District Amateur Wireless Society—*Hon. Sec.*, 37, Mexborough Avenue, Leeds.
- Leeds Y.M.C.A. Wireless Society—*Hon. Sec.*, 8, Warrels Terrace, Bramley, Leeds.
- †Leicestershire Radio Society—*Hon. Sec.*, 269, Mere Road, Leicester.
- †The Leys School Wireless Society—*Hon. Sec.*, The Leys School, Cambridge.
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- †Liverpool Wireless Association—*Hon. Sec.*, 76, Old Hall Street, Liverpool.
- †London County Council Radio Society—*Hon. Sec.*, Room 38, County Hall, Westminster Bridge, S.E.1.
- †Luton Wireless Society—*Hon. Sec.*, Hitchin Road Boy's School, Luton.
- Maidstone and District Radio Society—"Romleigh," Postley Road, Maidstone, Kent.
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- †The Malta Radio Society—*Hon. Sec.*, 22, T. Sda. Mercanti, Valletta, Malta.
- †Malvern Wireless Society—*Hon. Sec.*, Burford House, Worcester Road, Malvern.
- †Manchester Wireless Society—2, Parkside Road, Princess Road, Manchester.
- †Radio Scientific Society of Manchester—*Hon. Sec.*, 16, Todd Street, Manchester.
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- †The North London Wireless Association—*Hon. Sec.*, Polytechnic Institute, Holloway Road, N. 7.

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- †Newport and District Radio Association—*Hon. Sec.*, 92, Corporation Road, Newport.
- Newton-in-Makerfield and District Radio Society—*Hon. Sec.*, 220, Earl Street, Earlestown, Lancs.
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- Northern Radio Society—*Hon. Sec.*, 29, Stalebroke View, Chapeltown, Leeds.
- †North London Wireless Association—*Hon. Sec.*, Northern Polytechnic, Holloway, N.1.
- †North Middlesex Wireless Club—*Hon. Sec.*, "Nithsdale," Eversley Park Road, Winchmore Hill, N.
- †North Staffs Railway Electricity Department Wireless Society—*Hon. Sec.*, 87, Spencer Road, Shelton, Stoke-on-Trent.
- †Oldham Lyceum Wireless Society—*Hon. Sec.*, 16, South Hill Street, Oldham.
- Oxford and District Amateur Radio Society—*Hon. Sec.*, 119, Ifley Road, Oxford.
- †Paddington Wireless and Scientific Society—*Hon. Sec.*, 61, Burlington Road, Bayswater, W.2.
- †Plymouth Wireless and Scientific Society—*Hon. Sec.*, 9, Ryder Road, Stoke, Devonport.
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- Portsmouth and District Amateur Wireless Society—*Hon. Sec.*, 34, Bradford Road, Southsea.
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- †Preston Scientific Society—*Hon. Sec.*, 119A, Fishergate, Preston.
- †Pudsey and District Wireless Society—21, The Wharrels Low Town, Pudsey, Nr. Leeds.
- †The Ramsgate, Broadstairs and District Wireless Society—*Hon. Sec.*, Rochester Cottage, High Street, St. Lawrence, Ramsgate.
- Redditch and District Radio Society—"The Elms," Alvechurch.
- †The Redhill and District Y.M.C.A. Wireless Society—*Hon. Sec.*, Surbiton House, Redhill, Surrey.
- Scarborough and District Wireless Club—*Hon. Sec.*, 4, Carlton Terrace, Scarborough.
- †Sheffield and District Wireless Society—*Hon. Sec.*, 18, Linden Avenue, Woodseats, Sheffield.
- †Shrewsbury and District Radio Society—*Hon. Sec.*, 1, High Street, Shrewsbury.
- †Smethwick Wireless Society—*Hon. Sec.*, Radio House, Wilson Road, Smethwick, Staffs.
- Southampton and District Wireless Society—*Hon. Sec.*, 24, Floating Bridge Road, Southampton.
- †Southend and District Radio Society—*Hon. Sec.*, 4, Wimborne Road, Southend-on-Sea.
- †The South London Wireless and Scientific Society—*Hon. Sec.*, St. John's Institute, Larcom Street, S.E.17.
- †Southport Wireless Society—*Hon. Sec.*, 71, Norwood Crescent, Southport, Lancs.
- South Shields and District Radio Club—*Hon. Sec.*, 66, Salmon Street, South Shields.
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- †Stockport Wireless Society—*Hon. Sec.*, Mersey Chambers, King Street East, Stockport.
- Stockton and District Amateur Wireless Society—*Hon. Sec.*, 4, Berkeley Square, Norton-on-Tees.
- Streatham Radio Society (Streatham Hill College—*Hon. Sec.*, "Compton," Pendennis Road, S.W.16.
- †The Streatham Radio Society—*Hon. Sec.*, 2, Parklands Road, Streatham, S.W.16.
- †Sunderland and District Amateur Radio Society, 8, Briery Vale, Ashbrook, Sunderland.
- †Sunderland and District Amateur Radio Society—*Hon. Sec.*, 15, Ridley Street, Southwick-on-Wear.
- †Sunderland Wireless and Scientific Association—*Hon. Sec.*, Richardson, Westfield House, Sunderland.
- †The Sutton and District Wireless Society—*Hon. Sec.*, Stanley Lodge, Rosebery Road, Cheam, Surrey.
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- †Sussex Wireless Research Society—*Hon. Sec.*, E. Hughes, Esq., B.Sc., A.M.I.E.E., Technical College, Brighton.
- Radio Society of Tavistock—*Hon. Sec.*, 2, Parkwood Road, Tavistock.
- Taunton School Radio Society—*Hon. Sec.*, Taunton School, Taunton.
- †Thames Valley Radio and Physical Association—*Hon. Sec.*, 17, Leinster Avenue, East Sheen, S.W.14.
- Trafalgar Wireless Society—*Hon. Sec.*, 57, Amersham Vale, New Cross, S.E.14.
- †Tottenham Wireless Society—*Hon. Sec.*, 22, Broadwater Road, Bruce Grove, Tottenham, N.
- †Borough of Tynemouth Y.M.C.A. Radio and Scientific Society, 37, Borough Road, North Shields.
- †The Wakefield and District Wireless Society—*Hon. Sec.*, 11, Thornes Road, Wakefield, Yorks.
- †The Wallasey Wireless and Experimental Society—106, Albion Street, New Brighton.
- †Walthamstow Amateur Radio Club—*Hon. Sec.*, 60, Ulverston Road, Upper Walthamstow, E.17.
- †Wanstead Wireless Society—18, Clavering Road, Wanstead Park, E.12.
- †Wandsworth Wireless Society—*Hon. Sec.*, Technical Institute, High Street, Wandsworth.
- Warrington Radio Association—266, Lovely Lane, Warrington.
- Watford and District Radio Society—*Hon. Sec.*, 175, Leavesden Road, Watford.
- †The Wembley Wireless Society—*Hon. Sec.*, 10, Westbury Avenue, Wembley, Middlesex.
- †West London Wireless and Experimental Association—*Hon. Sec.*, 19, Bushey Road, Harlington, Middlesex.
- †Willesden Wireless Society—*Hon. Sec.*, 70, Craven Park, Harlesden, N.10.
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- Wireless Society of Winchester—*Hon. Sec.*, 65, Cromwell Road, Winchester.
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- Working Men's College Wireless Club—*Hon. Sec.*, Crowndale Road, N.W.
- †York Wireless Club—*Hon. Sec.*, 16, Wentworth Road, York.

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Union of Greek Wireless Telegraphists, Athens.

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- *Haddonfield Radio League—*Pres.*, Edw. Braddock, 31, King's Highway, E. Haddonfield, N.J.
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- Irvington N.J. Radio Club—The Club House, 55, Linden Avenue, Irvington, N.J.
- *Jefferson City Radio Club—*Sec.*, Bethel Brace, 403, E. Ashley Street, Jefferson City, Mo.
- *Kokomo Radio Association—*Sec.*, John McDowall, Kokomo, Ind.
- *Laconia Radio Club—*Sec.*, George W. Mayo, Room 12, Smith Block, Laconia, N.H.
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- *Lake Superior Radio Association—*Sec.*, David S. Lloyd, Sault Ste. Marie, Ont., Can.
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- *Rutherford Radio Club—*Pres.*, Richard C. Innes, 82, Home Avenue, Rutherford, N.J.
- *San Antonio Radio Club—*Sec.*, G. T. Atchison, 372, Roosevelt Avenue, San Antonio, Texas.
- *Scarsdale Wireless Association—*Pres.*, Franklin E. Welas, Scarsdale, N.Y.
- *Scenic Highway Radio Club—Gus A. Gummeson, 503, N. 3rd Street, Clinton, Iowa.
- *Sedalia Amateur Radio Club—*Pres.*, Otto S. McDaniel, Sedalia, Mo., 613, W. 7th Street.
- *Seymour Radio Club—*Pres.*, E. S. Welch, 518, No. Pine Street, Seymour, Ind.
- *Sheboygan Radio Association—*Sec.*, Melvin Herman, 1419, S. 9th Street, Sheboygan, Wisc.
- *South California Radio Association—*Sec.*, Harold Duvall, 4965, Wadsworth Street, Los Angeles, Calif.
- *South Jersey Radio Association—*Second Vice-Pres.*, Edw. B. Patterson, W. Walnut Avenue, Merchantville, N.J.
- South Side Radio Association—*Sec.*, B. W. Stolte, 3554, S. Halstead Street, Chicago, Ill.
- Southampton Radio Club—*Sec. and Treas.*, Clarence Deim, Water Mill, New York.
- *Springfield Radio Association—*Act. Pres.*, Horace Tyson, 7, Pomona Street, Springfield, Mass.
- Star Radio Club—*Sec.*, Joseph L. Whalen, 113, Philip Street, Coal Dale, Pa., U.S.A.
- *Staunton Radio Club—*Sec.*, Arthur Klinger, Staunton, Ill. P.O. Box 546.
- States Island Radio Club—*Sec.*, Gröpp, 24, Osgood Avenue, Stapleton, S.I.
- *Stoneham Radio Association—*Sec.*, Leonard Patridge, 12, Mt. Washington Street, Stoneham, 80, Mass.
- *Stuyvesant Radio Club—*Sec.*, Murray Blum, 17, W. 116th Street, New York City.
- *St. Joseph Valley Radio Association—*Sec.*, V. A. Blormquist, 510, Sherman Avenue, South Bend, Ind.
- *St. Louis Radio Association—*Sec.*, J. E. Fritz, 4880, Margaretta Avenue, St. Louis, Mo.
- *St. Paul Central High School Radio Club—*Sec.*, Max Levy, 683, W. Central Avenue, St. Paul, Minn.
- *St. Paul Y.M.C.A. Radio Club—*Sec.*, C. J. Otterholm, 993, Flandraw Street, St. Paul, Minn.
- *Summit Radio Club—*Act. Sec.*, Norbert Nuber, 3001, Peach Street, Erie, Pa.
- *Sunset Radio Club—*Sec.*, A. A. Hudgins, 845, B. Avenue, Coronada, Calif.

- *Tech. Radio Club—*Sec.*, Edwin R. Kluss, 414, Moss Avenue, Oakland, Calif.
- *Terre Haute Radio Club—*Sec. and Treas.*, Howard A. Derry, 1716, N. 8th Street, Terre Haute, Ind.
- *The Butte Radio Club—*Sec.*, M. L. Gray, 1212, E. Second Street, Butte, Mont.
- *The Cleveland Radio Association—*Sec.*, A. R. Tyler, 14001, Ardenall Avenue, E. Cleveland, Ohio.
- *The Conneaut Radio Club—*Sec.*, Laurence Madison, 240, Centre Street, Conneaut, Ohio.
- *The Hudson Amateur Radio Club—*Sec.*, Samuel Jackson, Jr., 345, W. 68th Street, New York City.
- *The Limited Radio Association—*Sec.*, Chas. A. Prevot, 2029, Burling Street, Chicago, Ill.
- *The Maplewood High School Radio Club—*Sec.*, Chas. Edw. Harrison, 7561, Ellis Avenue, Maplewood, Mo.
- *The Morris County Radio Club—*Sec.*, Robert M. Lacey, 11, Millis Street, Morristown, N.J.
- *The Mt. Sterling Radio Association—*Sec.*, Bernard Simon, Mt. Sterling, Ill.
- *The North Shore Radio Club—*Sec.*, Walter Watts, 7418, Sheridan Road, Chicago, Ill.
- *The QSA Radio Club—*Sec.*, Joseph A. Staples, Jr., 43rd. Street, Forest Hill, So. Richmond, Va.
- *The Radio Amateur Club—*Sec.*, C. B. Sorgen, Carbondale, Ill.
- *The Radio Association of Salem—*Sec.*, H. B. Churchill, Salem, Ore.
- *The Radio Club—*Treas.*, Alfred C. Oechler, 55, Linden Avenue, Irvington, N.J.
- *The South Bend Radio Research Club—*Pres.*, Allan Kalb, 806, Leland Avenue, South Bend, Ind.
- *The Ypsilanti Radio Association—*Sec.*, Ned Wier, Route 2, Ypsilanti, Mich.
- *Triangle Radio Society—*Sec.*, Thomas J. Whalen, 115, Broadway, Rochester, N.Y.
- *Tri-County Radio Club—*Sec.*, Geo. C. Robinson, 657, North 8th Street, Richmond, Va.
- *Tri-State Radio Association—*Sec.*, D. F. Baker, 3042, Cleinview Avenue, Cincinnati, Ohio.
- *Troy Y.M.C.A. Radio Club—*Sec.*, J. D. McKnight, Troy, N.Y.
- *Twin City Radio Club—*Pres.*, Edw. P. McShane, 42, Whipple Street, Lewiston, Maine.
- *Union Central Radio Association—*Sec.*, Dorman D. Isreal, Apt. "Y" Hamilton Building, Cincinnati, Ohio.
- *Union College Radio Club—*Sec.*, Leo C. Freedman, Schenectady, N.Y.
- *United Electric and Wireless Association—*Sec.*, Edgar A. Green, 825, Cedar Street, Hagerstown, Md.
- *University of California Radio Club—*Sec.*, L. B. Kennedy, 2616, Virginia Street, Berkeley, Calif.
- *University of Virginia Radio Club—*Sec.*, Francis Wm. Taylor, c/o Mrs. E. M. Page, University, Va.
- *Utah Radio Association—*Sec.*, Eugene Pack, 501, So. 13th Street, E. Salt Lake City, Utah
- *Valley City Radio Club—*Sec. and Treas.*, Leslie M. Duvall, Valley City, N. Dak.
- *Waco Hertzian Society—*Vice-Pres.*, Henry M. Harris, Box 427, Waco, Texas.
- *Warren Radio Association—*Pres.*, Edwin D. Strickland, 123, Canton Street, Warren, Pa.
- *Washington Radio Club—*Sec. and Treas.*, H. A. Snow, 1656, Newton Street, N.W., Washington, D.C.

*Wauwatosa Radio Club—*Sec.*, Ralph Smith, 359, First Avenue, Wauwatosa, Wisc.

*Wayland Academy Wireless Club—*Sec.*, Wm. E. Hanna, Beaver Dam, Wisc.

*West Allis Radio Club—*Sec.*, Mark H. Doll, 602, 64th Avenue, West Allis, Wisc.

*West Haven Radio Association—*Pres.*, W. A. Rida, 810, Savin Avenue, W. Haven, Conn.

*Westfield Radio Association—*Sec.*, Clifford D. Warren, Middle Farms, Westfield, Mass.

*West Side Radio Club—*Pres.*, J. Q. Adams, 5410, Fulton Street, Chicago, Ill.

*Wireless Association of Atlantic City—*Sec.*, Harry J. Hemphill, Room 2, Maharba Buildings, Atlantic City, N.J.

*Wireless Association of Pa.—*Sec.*, Mrs. F. B. Chambers, 2046, Arch Street, Philadelphia, Pa.

*Worcester County Radio Association—*Pres.*, S. A. Waite, 49, Benefit Street, Worcester, Mass.

*Worcester North Radio Association—*Sec. and Treas.*, Dean A. Lyon, 54, Cottage Street, Leominster, Mass.

*Worcester Polytechnic Institute—*Sec.*, R. E. Cushing, Wireless Association, Worcester, Mass.

*"Y" Radio Club—*Sec.*, R. H. Schauer, 1009, E. Haley Street, Santa Barbara, Calif.

*Yates Radio Club—*Pres.*, C. Babcock, 112, Head Street, Penn Yan, N.Y.

*Y.M.C.A. Radio Club—*Sec.*, T. North, 1510, Laurel Avenue, St. Paul, Minn.

*Y.M.C.A. Radio Club—*Sec.*, H. W. Muller, 153, E. 80th Street, New York City.

*Y.M.C.A. Radio Club—*Sec.*, Clifford G. Fick, Sioux Falls, S. Dak.

*Y.M.C.A. Radio Club of Rome—*Sec.*, Stephen Zingerline, 105, W. Liberty Street, Rome, N.Y.

*Yonkers Radio Club—*Sec.*, Walter A. Remy, 356, Desmond Avenue, Bronxville, N.Y.

EXPERIMENTAL WIRELESS TRANSMITTING STATIONS

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 AA	—	—	Radio Communication Company (Slough Experimental Station).
2 AF	—	C.W.	A. Rickard Taylor, 49, Idmiston Road, W. Norwood.
2 AG	—	C.W.	A. Rickard Taylor, 49, Idmiston Road, W. Norwood.
2 AH	—	C.W.	Oxford.
2 AK	—	Spark C.W. and Telephony	R. M. Radio, Ltd., Townslead Mills, Worcester.
2 AL	—	C.W. and Telephony	W. Halstead, Briar Royd, Briar Lane, Thornton-le-Fylde.
2 AN	—	C.W. and Telephony	A. W. Sharman, Kelvin Lodge, 1, Morella Road, S.W.
2 AO	10	Spark, C.W. and Telephony	O. H. Relly, Stratton, De Roos Road, Eastbourne.
2 AQ	—	Spark, C.W. and Telephony	Davis, Thornton Heath, London, S.W.
2 AR	—	—	E. Gaze, 3, Archibald Street, Gloucester.
2 AU	—	—	A. C. Bull, 25, Fairland Road, West Ham, E.15.
2 AV	10	Telephony	D. H. W. Swiney, 18, Southchurch Road, Southend-on-Sea, Essex. 'Phone, 380.
2 AW	100	C.W. and Telephony	H. H. Burbury, Crigglestone, Wakefield.
2 AX	10	—	Geo. Sutton, 18, Melford Road, S.E.22.
2 AY	10	Portable station, C.W., T.T. and Telephony.	Dudley F. Owen, Limehurst, Sale, near Manchester.
2 AZ	—	Spark, C.W. and Telephony	William Le Queux.
2 BC	10	C.W., T.T. and Telephony	Dudley F. Owen, Limehurst, Sale, near Manchester.
2 BM	—	C.W. and Telephony	J. H. A. Whitehouse, 25, Ennersdale Road, New Brighton, Cheshire.
2 BZ	10	C.W. and Telephony	Basil Davis, Pavilion, Marble Arch, W.1.
2 CA	—	—	J. H. Reyner, 69, Station Road, Chingford.
2 CB	—	C.W. and Telephony	W. E. Cooke, 29, Empress Avenue, South Chingford.
2 CH	10	Spark, C.W. and Telephony	Science Society, The School, Oundle, Northants.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 CI	10	Spark - - -	R. Brooks King, Widcombe, Taunton.
2 CM	—	Spark quenched gap and C.W.	Norman D. B. Hyde, 92, Littledale Road, Egremont, Cheshire.
2 CO	10	Spark and C.W. -	J. C. Elmer, 14, Gordon Square, Birchington, Kent.
2 CP	—	—	Portable, 10 miles from above.
2 CZ	10	Spark, C.W. Tonic-Train and Telephony	C. Atkinson, 17, Beaumont Road, Leicester.
2 DC	10	C.W. and Telephony	M. Child, 60, Ashworth Mansions, Maida Vale.
2 DD	10	Spark - - -	A. C. Davis, 105, Brynland Avenue, Bristol.
2 DF	10	Spark, T.T., C.W. and Telephony	R. E. Miller, 65, Malden Road, New Malden, Surrey.
2 DG	10	—	W. Barnett, 63, Mount Road, Parkwood Springs, Sheffield.
2 DH	10	Spark and C.W. -	W. Barnett, 63, Mount Road, Parkwood Springs, Sheffield. Portable Set.
2 DI	10	Spark and C.W. -	W. Barnett, 63, Mount Road, Parkwood Springs, Sheffield. Portable Set.
2 DJ	10	C.W. and Telephony	A. T. Lee, The Court, Alvaston, Derby.
2 DT	—	—	Barrow and District Wireless Association.
2 DU	10	C.W. and Telephony	W. D. Norbury, 51, Chilwell Road, Beeston, Notts.
2 DX	10 & 50	C.W. and Telephony	W. K. Alford, "Rosedene," Camberley, Surrey.
2 DY	—	—	F. Haynes, 5, Regent Square, W.C.1.
2 DZ	—	—	—
2 FA	—	—	F. G. Bennett, 16, Tivoli Road, Crouch End, N.8.
2 FB	10	Spark, C.W. and Telephony	W. Ison, 80, Harnham Road, Salisbury.
2 FG	—	Spark, C.W. and Telephony	L. McMichael, 32, Quex Road, W. Hampstead.
2 FH	10	C.W. and Telephony	T. S. Rogers, 2, Park Hill, Moseley, Birmingham.
2 FL	100, 50	Spark, C.W. and Telephony	C. Willcox, 21, George Street, Warminster, Wilts.
2 FM	—	C.W. and Telephony	V. Corelli, 41a, Grove Road, Eastbourne.
2 FN	10	—	L. Baker, Ruddington, Notts.
2 FP	10	Spark, Telephony, C.W. and T.T.	F. Foulger, 118, Pepys Road, S.E. 14.
2 FQ	—	C.W. and Telephony	Burndept Ltd., Experimental Station, Blackheath.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 FR	10	C.W. and Telephony	S. Rudeforth, 54, Worthing Street, Hull.
2 FT	—	C.W. and Telephony	Edinburgh and District Radio Society.
2 FU	10	Spark, C.W. and Telephony	E. T. Manley, Jr., 49, Arthur Road, Wimbeldon Park, S.W.19.
2 FW	—	Spark	Rev. D. Thomas, St. Paul's B.P. Scouts, Bournemouth. Also Portable Set.
2 FX	—	Spark, C.W., T.T. and Telephony	H. C. Binden, Bournemouth.
2 FZ	10 and 1 kw	Spark, C.W. and Telephony	Manchester Wireless Society, Headquarters, Albion Hotel, Piccadilly, Manchester. Also portable set, same details and call sign.
2 GA	10	Spark	Rev. J. A. Gibson, 18, Daniel Street, Bath.
2 GD	10	For Indoor Transmissions only	Birmingham Wireless Experimental Club, Digbeth Institute, Birmingham.
2 GG	—	—	A. H. Kidd.
2 GJ	—	—	Park View, Hindehouse Lane, Firk Park, Sheffield.
2 GL	10	C.W. and Telephony	W. J. Henderson, 2, Hollywood Road, S.W.10.
2 GP	10	Spark, C.W. and Telephony	Wilfrid Gartland, 14, Baalbec Road, London, N.5.
2 GQ	10	Spark	1st Taunton Scouts, Parish Buildings, Wilton, Taunton (also portable).
2 GR	10	Spark, C.W. and Telephony	Thomas Forsyth, Wenslea, Ashington, Northumberland.
2 GS	10	Spark, C.W. and Telephony	Thomas Forsyth, Wenslea, Ashington, Northumberland. Portable set.
2 GT	—	—	Gilbert Irvine, 12, Treborth Street, Liverpool. Portable set.
2 GU	10	—	Halifax Wireless Club.
2 GV	10	Spark, C.W. and Telephony	Rev. W. P. Rigby, St. Lawrence Vicarage, Bristol.
2 GW	10	C.W. and Telephony	Allan Cash, Foxley Mount, Lymm, Cheshire.
2 GZ	—	C.W. and Spark	A. L. Megson, Bowdon.
2 HA	—	C.W. and Spark	A. L. Megson, Bowdon. Portable set.
2 HB	10	Spark, C.W. and Telephony	L. H. Lomas, Highfield, Sammerseat, near Manchester.
2 HC	10	C.W. and Spark	J. W. White, Windcombe Lodge, Bucklesbury, near Reading.
2 HF	—	—	W. G. Gold, "Rosedale," Belwell Lane, Four Oaks, near Birmingham.
2 HG	10	Spark	T. Boutland, Senr., Ashington, Northumberland.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 HH	10	Spark - - -	T. Boutland, Junr., Ashington, Northumberland.
2 HK	—	—	A. A. Campbell Swinton, Chester Square, W.
2 HP	10	C.W. and Telephony	H. C. Woodhall, 10, Holborn House, E.C.1.
2 HQ	10	C.W. and Spark -	A. W. Fawcett, 11, Leigh Road, Clifton, Bristol.
2 HR	10	C.W. and Telephony	F. O. Read & Co., Ltd., 13-14, Great Queen Street, Kingsway, W.C.2.
2 HS	—	Telephony and Tonic Train, C.W. and Telephony	G. W. Hale and R. Lyle, 36, Dagnall Park, South Norwood, S.E.25.
2 HT	—	Spark, C.W. and Telephony	R. H. Klein, 18, Crediton Hill, W. Hampstead, N.W.6.
2 HV	10	Telephone - - -	H. Beresford, Wylde Green, Birmingham.
2 HW	10	Telephone - - -	H. Beresford, Wylde Green, Birmingham.
2 HX	—	Spark, C.W. and Telephony	F. A. Love, Ivydene, Guildford Park Road, Guildford.
2 IB	10	C.W. and Telephony	W. Bemrose, Littleover Hill, Derby.
2 ID	10	C.W. and Spark -	E. S. Firth, Thames Ditton.
2 IF	10	C.W. and Telephony	S. W. Bligh, 2, North Lane, Canterbury.
2 IH	—	—	Technical College, Cardiff.
2 II	10	Spark - - -	Southport Wireless Society, 74a, Kensington Road, Southport.
2 IJ	—	—	Southport Wireless Society, 74a, Kensington Road, Southport. Portable set.
2 IK	10	C.W. and Telephony	County High School for Boys, Altrincham, Cheshire.
2 IL	10	Telephony - - -	H. R. Goodall, "Fernlea," Winchester Road, Bassett, Southampton.
2 IN	10	C.W., Spark and Telephony	J. E. Fish, "Thornleigh," Thornton-le-Fylde, near Blackpool.
2 IQ	—	C.W. and Telephony	W. A. Ward, 26, Marlborough Road, Sheffield.
2 IS	—	—	Rev. W. H. Doudney, St. Luke's Vicarage, Bath.
2 IT	—	Portable Set - - -	Rev. W. H. Doudney, St. Luke's Vicarage, Bath.
2 IU	10	—	G. A. E. Roberts, Twyford, Winchester.
2 IV	10	Spark, C.W. and Telephony	L. F. White, Priory Road, Knowle, Bristol.
2 IW	10	—	G. R. Marsh, Twyford, Winchester.
2 IX	10	C.W. and Telephony	S. G. Taylor, Littleover, Derby.
2 IY	10	—	J. Briggs, City School of Wireless Telegraphy, 66, Corporation Street, Birmingham.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 JB	—	Closed Aerial, C.W.	P. H. Dorte, Downside Wireless Society, Downside School, Stratton-on-the-Fosse, near Bath.
2 JC	10	Spark, C.W. and Telephony	I. H. Storey, "Escowbeck," Caton, Lancaster.
2 JD	250	C.W. and Telephony	
	10	Spark, C.W. and Telephony	I. H. Storey, White Cross Mills, Lancaster.
2 JF	250	C.W. and Telephony	
	10	Spark, C.W. and Telephony	C. G. Williams, 22, Scholar Street, Sefton Park, Liverpool.
2 JG	—	—	W. A. Seed, Crigglestone, near Wakefield.
2 JH	10	—	C. W. Barrand, "Stefano," Wellington Street, Slough.
2 JJ	10	—	C. Worthy, 4, Riversdale Road, Egremont, Wallasey.
2 JK	10	Spark, C.W., T.T. and Telephony	Philip R. Coursey, 138, Muswell Hill Road, N.10.
2 JL	10	Spark, C.W. and Telephony	G. G. Bailey, The Beeches, Cowley, Middlesex
2 JM	10	Spark, C.W. and Telephony.	G. G. Blake, 10, Onslow Road, Richmond, Surrey.
2 JN	10	C.W. and Telephony	H. B. Burdekin, Bilton, Rugby.
2 JO	10	Spark, C.W. and Telephony.	J. W. Whiteside, 30, Castle Street, Clitheroe, Lancs.
2 JP	—	Spark, C.W. and Telephony	M. C. Ellison, Huttons Ambo Hall, York
2 JQ	—	Spark, C.W. and Telephony.	M. C. Ellison, Huttons Ambo Hall, York. Portable Set.
2 JU	10	Spark, C.W. and Telephony.	E. J. Pearcey, 610, Fulham Road, S.W.
2 JV	10	Spark, C.W. and Telephony.	A. G. Robbins, Station Road, Epping.
2 JW	10	C.W. and Telephony	J. R. Barrett, Westgate Court, Canterbury.
2 JX	10	C.W. and Telephony	L. Vizard, 12, Seymour Gardens, Ilford
2 JZ	100	C.W. and Telephony	R. D. Spence, Craighead House, Huntley, Aberdeenshire.
2 KA	10	—	N. Curtis, Belvedere, West Taunton
2 KB	10	C.W., Telephony and T.T.	W. E. Earp, 675, Moore Road, Mapperley, Nottingham.
2 KC	10	C.W. and Telephony	H. T. Longuehay, 96, Barnmead Road, Beckenham.
2 KD	10	C.W., T.T., Chopped C.W., and Telephony	Denison Bros., Experimental Station, Wainhouse Tower, Halifax.
2 KF	10	C.W. and Telephony	J. A. Partridge, 22, Park Road, Colliers Wood, Merton, S.W.19
2 KG	10	Spark, C.W. and Telephony	'Phone, Wimbledon 2291. A. E. Hay, "Glendale," Abernant Aberdare.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 KK	10	—	Hutchinson & Co. (F. Pinkerton), 101, Dartmouth Road, Forest Hill, S.E.23.
2 KL	10	Spark	F. Pinkerton, 50, Peak Hill, Sydenham, S.E.26.
2 KM	—	C.W. and Telephony	C. Stainton, 155, Escourt Street, New Bridge Road, Hull.
2 KN	Artificial Aerial	C.W. and Telephony	A. B. Day, Finchley.
2 KO	10	C.W. and Telephony	C. S. Baynton, 48, Russell Road, Moseley, Birmingham.
2 KP	10	Spark and Telephony	F. A. Bird, 13, Henrietta Road, Bath.
2 KQ	10	—	Wolverhampton (Communications to Taylor Relief Motor Co., Ltd., Cleveland Street, Wolverhampton).
2 KR	10	C.W. and Telephony	E. Edmonds, 2, Yew Tree Road, Edgbaston, Birmingham.
2 KS	10	C.W., Spark, T.T. and Telephony	C. W. Beakell, Mill Bank, Church Street, Preston.
2 KT	—	Spark, C.W. and T.T.	J. E. Nickless, 83, Wellington Road, Snaresbrook, E.11.
2 KU	10	Spark, Telephony and T.T.	A. J. Selby, 66, Edward Street, Burton-on-Trent.
2 KV	—	C.W. and Telephony	W. J. Crampton, Weybridge.
2 KW	—	C.W. and Telephony	W. R. Burne, Springfield, Thorold Grove, Sale, Cheshire.
2 KX	10	Spark, C.W. and Telephony	W. Stanworth, Fern Bank, Blackburn.
2 KY	10	C.W. and Telephony	L. Pollard, 209, Cunliffe Road, Blackpool.
2 KZ	10	Spark, C.W. and Telephony	B. Clapp, Meadmoor, Brighton Road, Purley.
2 LA	—	C.W. and Telephony	H. F. Yardley, 121, Victoria Road, Headingley, Leeds.
2 LB	—	C.W. and Telephony	H. F. Yardley, 6, Blenheim Terrace, Leeds.
2 LF	—	Spark and C.W.	P. Harris, Chilvester Lodge, Calne, Wilts.
2 LG	10	C.W. and Telephony	H. H. Whitfield, The Glen, Primrose Lane, Hall Green, Birmingham.
2 LI	—	Spark, C.W. and Telephony	C. H. Wilkinson, Kingswood Avenue, N.W.6.
2 LJ	5	C.W. and Telephony	Worc. Cadet Signal Coy., R.C. of Sigs., Junior Technical School, Sansome Walk, Worcester.
2 LK	10	Tonic Train and C.W.	S. Kniveton, Brooklands, Norman- ton, Yorks.
2 LL	10	Tonic Train and C.W.	S. Kniveton, Brooklands, Norman- ton, Yorks.
2 LO	—	—	London Station of British Broad- casting Co.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 LP	10	Spark, C.W. and Telephony	A. W. Knight, 26, Stanbury Road, S.E.
2 LQ	—	Closed Aerial - -	J. A. Henderson, 18, Elm Hall Drive, Mossley Hill, Liverpool.
2 LR	10	C.W. and Telephony	John Scott Taggart, 6, Beattyville Gardens, Ilford.
2 LT	10	Spark, C.W. and Telephony	Arthur F. Bartle, Blanford House, 5, Ulundi Road, Blackheath, S.E. 3
2 LU	10	C.W. and Telephony	W. A. Appleton, Wembley Park.
2 LV	—	Spark, C.W. and Telephony	W. R. H. Tingey, 22, Leinster Gardens, W.2.
2 LW	—	Spark, C.W. and Telephony	W. R. H. Tingey, Queen Street, Hammersmith.
2 LY	10	Telephony - -	H. H. Thompson, 59, Redlands Road, Penarth, Glam.
2 LZ	10	Spark, C.W. and Telephony	F. A. Mayer, Stilemans, Wickford, Essex. 'Phone, Wickford 5.
2 MA	10	Spark, C.W. and Various Telephony	P. S. Savage, 14-16, Norwich Road, Lowestoft.
2 MB	10	C.W. and Telephony	E. H. Jeynes, 67, St. Paul's Road, Gloucester.
2 MC	10	C.W. and Telephony	Horace B. Dent, Albion, Fleetwood Avenue, Westcliff-on-Sea.
2 MD	10	Spark, C.W. and Telephony	C. Chipperfield, Victoria Road, Oulton Broad, Lowestoft.
2 MF	—	C.W. and Telephony	Marconi Scientific Instrument Co., Ltd., 21-25, St. Anne's Court, Dean Street, W.1.
2 MG	10	C.W. and Telephony	C. Creed Millar, Arndene, Bearsden, near Glasgow.
2 MH	10	Telephony - -	A. Lawton, Brown Edge Vicarage, Stoke-on-Trent.
2 MI	10	Spark, C.W. and Telephony	L. McMichael, Stag Works, Providence Place, Kilburn, N.W.6.
2 MK	10	C.W. and Telephony	A. W. Hambling, 23, Winchester Avenue, Brondesbury, N.W.6.
2 ML	10	Spark, C.W. and Telephony	R. C. Clinker, Bilton, Rugby.
2 MM	10	Spark, Interrupted C.W., C.W. and Telephony	Cecil A. Hines, Watley, Twyford, Winchester, Hants.
2 MO	—	C.W. and Telephony	Burndept, Ltd., Experimental Station, Chiswick.
2 MR	—	Temporarily closed.	
2 MS	10	C.W., Spark and Telephony	R. H. Reece, "Basketts," Birching-ton, Kent.
2 MT	1,000	Spark, C.W. and Telephony	Marconi Scientific Instrument Co. Station near Chelmsford (for specially authorised transmissions to amateurs).
2 MY	10	C.W. and Spark - -	H. M. Hodgson, Clifton House, Hartford, Cheshire.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 MZ	10	Spark, C.W. and Telephony	John Mayall, Burfield, St. Paul's Road, Gloucester
2 NA	10	Spark, C.W. and Telephony	H. Frost, Longwood, Barr Common, Walsall.
2 NB	—	—	J. W. Barnaby, Sylvan House, Broad Road, Sale, Cheshire.
2 ND	—	—	E. H. Pickford, Wingfield House, 6, Wilson Road, Sheffield.
2 NH	10	C.W. and Telephony	O. R. C. Sherwood, 41, Queen's Gate Gardens, S.W.
2 NI	10	Artificial Aerial	R. H. Lyne, Dartford and District Wireless Society.
2 NJ	—	—	Lee, S.E.12.
2 NK	10	C.W., Telephony, T.T. and Spark	P. Priest, 174, Woodside Road, Lockwood, Huddersfield.
2 NL	10	Spark	F. J. Hughes, Ashdene, 199, Wells Road, Bath.
2 NM	—	C.W. and Telephony	G. Marcuse, Coombe Dingle, Queen's Park, Caterham, Surrey. 'Phone 107.
2 NN	10	—	Brig.-General Palmer, Epping.
2 NO	10	C.W., T.T. and Telephony	H. R. Adams, Crescent Cabinet Works, Walsall
2 NP	—	C.W., T.T. and Telephony	H. G. Treadwell, Middleton Cheney, Banbury. 'Phone 3 Y Banbury.
2 NQ	10	C.W. and Telephony	R. J. T. Morton, 14, Woodside Road, Kingston-on-Thames.
2 NR	—	C.W. and Telephony	J. Knowles Hassall, Mount Pleasant Works, Wooden Box, near Burton-on-Trent.
2 NS	—	C.W., Telegraphy and Telephony	M. Burchill, 30, Leighton Road, Southville, Bristol.
2 NV	10	—	H. Nittley, Lodge Road, West Bromwich.
2 NW	10	—	H. Nittley, Lodge Road, West Bromwich. Portable set.
2 NY	10	C.W., T.T. and Telephony	J. N. C. Bradshaw, Bilsboro', near Preston.
2 NZ	10	C.W., T.T. and Telephony	J. N. C. Bradshaw, Bilsboro', near Preston.
2 OD	10	C.W. and Telephony	E. J. Simmonds, Meadowlea, Queen's way, Gerrards Cross, Bucks. 'Phone, Gerrards Cross, 288.
2 OF	10	Spark, C.W. and Telephony	H. C. Trent, Secondary School, Lowestoft.
2 OG	10	C.W. and Telephony	A. Cooper, 16, Wentworth Road, York.
2 OI	Artificial Aerial only	C.W., Telephony and Tonic Train	Colin Bain, Newcastle-on-Tyne.
2 OJ	25	C.W. and Telephony Spark	A. E. Hoghton, 52, First Avenue, Hove, Sussex.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 OK	—	—	D. H. Butler & Co., Ltd., 222, Great Dover Street, London, S.E.1.
2 OL	—	—	D. H. Butler & Co., Ltd., 222, Great Dover Street, London, S.E.1.
2 OM	—	C.W. and Telephony	H. S. Walker, Park Lodge, Brentford, Middlesex.
2 ON	10	Spark, C.W. and Telephony	Major H. C. Parker, 56, Shern Hall Street, Walthamstow, E.17.
2 OP	10	Spark, T.T., C.W. and Telephony	G. Courtenay-Price, 8, Lansdown Terrace, Cheltenham.
2 OQ	10	C.W. and Telephony	D. P. Baker, Cleveland Road, Wolverhampton. 'Phone, 1155/6.
2 OT	10	Spark, C.W. and Telephony	Ilford and District Radio Society.
2 OU	10	Spark, C.W. and Telephony	Ilford and District Radio Society. Portable Set.
2 OX	—	C.W. and Telephony	Dr. Ratcliffe, Elmdon, Moseley, Birmingham.
2 OY	10	C.W. and Telephony	Capt. E. J. Hobbs, 4th Tank Battn., Wareham.
2 OZ	10	Tonic Train, C.W. and Telephony	Worc. Cadet Signal Coy., R.C. of Sigs., Junior Technical School, Sansome Walk, Worcester.
2 PA	—	Spark, C.W. and Telephony	G. Z. Auckland & Son, 395, St. John Street, E.C.1.
2 PB	—	—	D. E. O. Nicholson, 41, Upper Kennington Lane, Lambeth, S.E.11.
2 PC	10	C.W. and Telephony	Davies, Timperley, Cheshire.
2 PD	10	C.W. and Telephony	W. Harvey-Marston, The Manor, Wildenhall, Staffs.
2 PF	10	—	F. Foulger, S.E.14.
2 PI	10	Spark, C.W. and Telephony	Loughborough College, Leicestershire.
2 PJ	10	Spark, C.W. and Telephony	Loughborough College, Leicestershire. Portable set for use within 10 mile radius of Loughborough College.
2 PL	10	C.W., T.T. and Telephony	Major L. N. Stephens, R.A., Haddon House, Bridport Harbour, Dorset.
2 PQ	—	C.W. Tonic Train and Telephony	G. E. Mortley & Co.'s Test Station, Nelson Road, Tunbridge Wells. 'Phone 159.
2 PR	10	C.W. and Telephony	A. E. Whitehead, "Hollingwood," King's Ride, Camberley, Surrey.
2 PS	10	C.W. and Telephony	J. H. Gill, 18, Fourth Avenue, Sherwood Rise, Nottingham.
2 PU	10	Spark, C.W. and Telephony	C. R. W. Chapman, "Nirvana," 44, Chaplin Road, Wembley.
2 PX	10	C.W. and Telephony	H. H. Lassman, 4, Avenue Parade, Barking Road, East Ham.
2 PZ	10	Spark, T.T., C.W. and Telephony	A. E. J. Symonds, 12, Addison Avenue, Holland Park, W.11.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 QA	10	C.W. and Telephony	H. W. Taylor, Camden House, Park Terrace, Cambridge.
2 QD	—	Spark, C.W. and Telephony	J. Ayres (10th Wimbledon B.P. Scouts), 18, Seaforth Avenue, New Malden, Surrey.
2 QH	10	C.W., T.T. and Telephony	C. Hewins, 42, St. Augustine Avenue, Grimsby.
2 QI	—	—	Balham.
2 QJ	10	C.W. Tonic Train Telephony	R. Walton, 70, Moorfield Road, Pendleton; Manchester.
2 QK	10	C.W. and Telephony	J. Bever, 85, Emm Lane, Bradford.
2 QL	—	C.W. and Telephony	R. J. Hibberd, Grayswood School, Haslemere, Surrey.
2 QN	10	—	A. Hobday, Flint House, North-down Road, Margate.
2 QO	—	Telephony	P. Pritchard, Blenheim House, Broad Street, Hereford.
2 QP	—	C.W., Telephony and Spark	L. C. Grant, 3, Langhorn Street, Newcastle-on-Tyne.
2 QQ	—	C.W. and Telephony	Burndept, Ltd., Experimental Station, Wembley.
2 QR	—	Spark, C.W. and Telephony	F. W. G. Towers, 12, Mayfield Road, Handsworth, Birmingham.
2 QS	10	Spark, C.W. and Telephony	S. Ward, "Ravenswood," 339, Brixton Road, S.W.9.
2 QT	—	—	C. C. Barnett, Lower Farm, Nether Compton, Sherborne, Dorset.
2 QU	—	—	Blackheath.
2 QV	—	—	A. J. Hurst, 3, Mayford Road, Balham.
2 QY	—	—	London, N.W.6.
2 QZ	10	C.W. and Telephony	Brian H. Colquhoun, 3, Eastbrook Road, Blackheath, S.E.3.
2 RB	10	Spark, C.W. and Telephony	H. B. Grylls, Trenay Fawton, Carew Road, Eastbourne.
2 RG	—	—	E. W. Scammell, 147, Solihull Road, Sparkhill, Birmingham.
2 RH	10	Spark, C.W. and Telephony	H. A. Pound, 101, High Street, Broadstairs.
2 RK	—	Spark	A. E. Blackall, 7, Maple Road, Surbiton.
2 RM	10	C.W. and Telephony	S. Cross, 3, Norman Road, Heaton Moor, near Stockport.
2 RP	10	C.W. and Telephony	F. W. Emerson, 178, Heaton Moor Road, Heaton Moor, near Stockport.
2 RS	10	C.W. and Telephony	Thomas Hesketh, 42, Castle Hill Avenue, Folkestone. 'Phone 134.
2 RT	—	—	North Eastern Instrument Co., Low Fell, Gateshead.
2 RU	—	—	North Eastern Instrument Co., Rowlands Gill Co., near Newcastle-on-Tyne.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 RV	—	—	North Eastern Instrument Co., Durham.
2 RW	10	C.W., T.T. and Telephony	6, Manor Gardens, Merton Park, S.W.20.
2 RY	—	—	S. Hanley, Forbury, Kintbury, Berks.
2 RZ	10	Spark, C.W. and Telephony	D. T. Woods, Denley Villa, Parker Road, Bournemouth.
2 SA	10	Spark - - -	Sir Hanbury Brown, Newlands, Crawley Down, Sussex.
2 SD	10	—	John Mayall, Burfield St. Paul's Road, Gloucester. Portable sending and receiving.
2 SF	—	C.W., T.T. and Telephony	C. Midworth, "Sumia," Ridgeway Road, Osterley Park, Middlesex.
2 SH	10	C.W., T.T. and Telephony	F. L. Hogg, 37, Bishop's Road, N.6.
2 SI	—	Spark, C.W., T.T. and Telephony.	L. C. Holton, 112, Conway Road, London, N.14.
2 SK	10	Spark, C.W. and Telephony	K. Graham Styles, 52, Jerningham Road, S.E.14.
2 SL	10	Spark, C.W. and Telephony	A. J. Styles, "Kitscot," 52, Bow Mount Road, Maidstone, Kent.
2 SM	—	C.W. and Telephony	R. J. Bates, Abbeygate Street, Bury St. Edmunds.
2 SP	10	C.W. and Telephony	L. Mansfield, "Cregneish," Ley Hay Park, Marple, Cheshire.
2 SQ	—	C.W. and Telephony	A. J. Spears, 25, Rawlings Road, Bearwood, Birmingham.
2 SX	5	C.W. and Telephony	F. B. Baggs, 24, Westhorpe Street, S.W. 15.
2 SY	—	C.W. and Telephony	H. Stevens, 25, Oaklands Road, Wolverhampton.
2 SZ	10	Spark, C.W. and Telephony	W. H. Brown, Mill Hill School, N.W.7.
2 TA	—	—	H. Andrewes, 8, North Grove, Highgate, N.6.
2 TB	10	C.W. Tonic Train and Telephony	H. W. Sellers, Carisbrooke, Langley Avenue, Bingley.
2 TC	10	C.W., Tonic Train and Telephony	H. W. Sellers, Carisbrooke, Langley Avenue, Bingley. Portable station.
2 TG	10	C.W. and Telephony	Sheffield University, Dept. of Applied Science, St. George's Square, Sheffield.
2 TH	10	C.W. - - -	Sheffield University. Portable set.
2 TI	10	C.W. and Telephony	H. Bevan Swift, A.M.I.E.E., 49, Kingsmead Road, Tulse Hill, S.W.2.
2 TM	10	C.W. and Telephony	L. H. Mansell, Woodfield, Madersfield, Malvern.
2 TN	10	C.W. and Telephony	C. E. Stuart, Lyndon Lodge, Polesworth, Tamworth.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 TO	10	C.W. and Telephony	F. Townsend, 46, Grove Lane, Ipswich.
2 TP	10	C.W. and Telephony	C. W. Andrews, "Radioville," 26, Melody Road, Wandsworth Common, S.W.18.
2 TQ	10	Telephony	T. C. Macanamara, Clontarf, 31, Rollscourt Avenue, Herne Hill, S.E.
2 TR	10	C.W., Tonic Train and Telephony	F. O. Sparrow, 8, North Drive, Swinton, Manchester.
2 TV	10	Fixed Station, C.W. and Telephony, Spark.	E. W. Wood, Electrical Engineer, 79, Colwyn Road, Northampton.
2 TV	10	C.W. and Telephony	E. W. Wood, 79, Colwyn Road, Northampton.
2 TW	—	Portable Station, C.W. Telephony	E. W. Wood, 79, Colwyn Road, Northampton.
2 TY	10	Spark, C.W. and Telephony	Sydney Scott, Field Villa, Norton, Malton.
2 TX	10	C.W. and Telephony	A. R. C. Johnston, 87, Twyford Avenue, Acton.
2 TZ	—	—	Ernest Jones, Newholme, Hempshaw Lane, Offerton, Stockport.
2 UA	10	C.W., T.T. and Telephony	S. B. P. Barnes, 38, Avenue Road, Highgate, N.6.
2 UC	—	—	E. J. Winstone, 53a, Gunterstone Road, West Kensington, W.
2 UD	—	—	Ernest W. Smith, 77, Grove Lane, Camberwell, S.E.5.
2 UF	10	C.W. and Telephony	H. Bailey, 51, Manchester Road, Denton, near Manchester.
2 UG	10	C.W. and Telephony	W. Humphreys Burton, 103, Portland Road, Nottingham.
2 UI	—	C.W. and Telephony	A. R. Ogston, Jr., 41, Broomfield Avenue, N.13.
2 UJ	Artificial Aerial	C.W., Telephony and Tonic Train	L. R. Richards, Mona, 25, Cholmeley Park, Highgate, N.6.
2 UK	Artificial Aerial	Spark, C.W. and Telephony	Cotteridge Day Continuation School, King's Norton, Birmingham.
2 UM	10	Spark, C.W. and Telephony	H. Lloyd, 3, Ventnor Place, Sheffield.
2 UN	10	C.W. and Telephony	Cardiff Y.M.C.A. Boys' Dept.
2 US	10	Spark, C.W. and Telephony	The Radio Society of Highgate, Highgate 1919 Club, South Grove, Highgate, N.6.
2 UV	10	Tonic Train, C.W. and Telephony	W. Corsham, 104, Harlesden Gardens, London, N.W.10.
2 UX	—	C.W. and Telephony	A. T. Headley, 255, Galton Road, Warley, Birmingham.
2 UY	10	C.W. and Telephony	W. Fenn, Holly Cottage, Polesworth, Tamworth.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power on Watts.	System of Transmission.	Name and Address
2 UZ	10	C.W. and Telephony	C. V. Stead, 29, Sholebroke View, Chapeltown, Leeds.
2 VC	10	Spark, C.W. and Telephony	A. S. Gosling, 63, North Road, West Bridgford, Nottingham.
2 VF	10	C.W. and Telephony	H. A. Blackwell, Whyte House, Bispham, Blackpool.
2 VI	10	C.W. and Telephony	H. Curtis, 26, Upper Hall Lane, Walsall.
2 VJ	10	Spark, Tonic Train, C.W. and Telephony.	B. J. Axten, "Ravenscourt," 78, Ealing Road, Wembley, Middlesex.
2 VK	—	C.W. and Telephony	Burndept, Ltd., Experimental Station, Blackheath.
2 VL	50	C.W. and Telephony	Mitchell's Electrical and Wireless, Ltd., McDermott Road, Peckham, S.E.15.
2 VM	10	C.W. and Telephony	J. Lipowskey, 614, Old Ford Road, Bow, E.
2 VN	10	I.C.W., C.W. and Telephony	M. H. Drury-Lavin, Old House, Sonning, Berks.
2 VO	10	C.W., T.T. and Telephony	Alan C. Holmes, 60, Aire View, Cononley, Keighley, Yorks.
2 VP	Artificial Aerial	—	P. G. A. H. Voigt, Bowdon Mount, 121, Honour Oak Park, S.E.23.
2 VQ	10	C.W. and Telephony	H. B. Old, 10, St. Jude's Avenue, Mapperley, Nottingham.
2 VT	—	C.W. and Telephony	W. K. Hill, 79, Beulah Hill, Upper Norwood, S.E.19. Phone Streatham 2096.
2 VW	10	C.W. and Telephony	E. H. Robinson, 125c, Adelaide Road, N.W.3.
2 VX	—	C.W. and Telephony	H. H. Thompson, 44, Northumberland Road, Coventry. Portable station.
2 WA	10	Telephony	J. Pigott, Manor Farm, Wolvercote, Oxford.
2 WB	Artificial Aerial	Spark, T.T., C.W. and Telephony	George W. Jones, 8, Rosebery Street, Wolverhampton.
2 WD	—	Spark, C.W. and T.T., and Telephony	C. W. Clarabut, Bedford Physical and Radio Society, Beechcroft, Beverley Crescent, Bedford.
2 WL	—	—	F. J. Cripwell, Lonkhill, Thorpe, Tamworth.
2 WM	10	C.W. and Telephony	Jos. W. Pallett, Leicester. Phone 2752.
2 WN	—	—	A. H. Wilson, 67, Broad Street, Hanley, Stoke-on-Trent.
2 WO	10 and 250	C.W. and Telephony	J. H. Brown, "Redbrook," Baguley, Cheshire.
2 WP	—	—	Experimental Station of Western Electric Co., London.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 WQ	10	Spark, C.W., T.T. and Telephony	C. H. Gardner, 2, Glebe Mount, Denmark Hill.
2 WR	—	—	L. W. Burcham, "Gouze-court," Chestnut Avenue, Oulton Broad, Suffolk.
2 WS	—	C.W. and Telephony	H. Squelch, Jun., 35, Crown Lane, Bromley, Kent.
2 WT	—	Tonic Train	H. Chadwick, 9, Raimond Street, Bolton.
2 WU	—	—	Capt. C. H. Bailey, The Monkswood Wireless Experimental Station, Monkswood, Usk, Mon.
2 WX	—	—	G. H. Gardner.
2 XA	10	Spark, C.W., T.T. Telephony	Rev. C. H. Townson, Wilts Farm School, Warminster.
2 XB	—	Spark, C.W. and Telephony	G. Z. Auckland & Son, 35, Douglas Road, Highbury.
2 XC	5	C.W. and Telephony	H. Johnson, "Avondale," Chestnut Walk, Worcester.
2 XD	—	C.W. and Telephony	H. R. Gladwell, London Road, Abridge, Essex.
2 XF	10	Spark, C.W. and Telephony	E. T. Chapman, 38, Serpentine Road, Poole, Dorset.
2 XI	10	—	R. H. Wagner, 6, Maresfield Gardens, N.W.3.
2 XJ	10	Spark, C.W. and Telephony	Department of Applied Science, Sheffield (Sheffield and District Wireless Society).
2 XK	10	Spark, C.W. and Telephony	L. H. Crowther, 18, Linden Avenue, Sheffield and District Wireless Society. Portable set.
2 XL	—	C.W. and Telephony	Captian Edward Davis, Pavilion, 22, Lavender Hill, S.W.11.
2 XM	—	Spark, C.W. and Telephony	Downside School, Stratton-on-the-Fosse, Bath.
2 XN	—	Spark and C.W.	Downside School, Stratton-on-the-Fosse, Bath.
2 XP	10	Spark, C.W. and Telephony	J. F. Payne, 22, Shakespeare Crescent, Manor Park, E.12.
2 XR	10	C.W. Tonic Train and Telephony	J. F. Haines, 36, Zetland Street, E.14.
2 XW	10	C.W., T.T. and Telephony	H. A. Woodyer, 118, Buckingham Road, Heaton Moor, near Stockport. Phone 412.
2 XX	—	—	D. F. Young, 23, Holcombe Road, Ilford, Essex.
2 XZ	10	Fixed Wavelength of 440	Lewis T. Dixon, "Strathspey," 4, Heythorp Street, Southfields, S.W.18.
2 YF	10	C.W. and Telephony	James R. Clay, Upper Longbottom, Luddendenfoot, S.O. Yorks.
2 YG	10	Spark, C.W. and Telephony	L. G. Boomer, 42nd Camberwell Troop, B.P. Scouts, 51, Brook Street, S.E.1.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
2 YH	10	C.W. and Telephony	J. E. Duveen, 40, Park Lane, W.1.
2 YI	10	C.W. and Telephony	W. J. Hewitt, B.Sc., 83, Reddings Road, Moseley, Birmingham.
2 YJ	10	—	Wireless Equipment, Ltd., 90, Charing Cross Road, London, W.C.2.
2 YK	—	—	T. M. Ovenden, 12a, Elgin Court, Elgin Avenue, Hampstead.
2 YM	10	C.W. and Telephony	Ralph W. Piper, "Elmhurst," 62, Chiltern View Road, Uxbridge.
2 YN	—	C.W. and Telephony	A. W. Thompson, 32, St. Nicholas Street, Scarborough.
2 YQ	—	C.W. and Spark	W. P. Wilson, 1, Highland Road, S.E.19.
2 YR	—	—	A. R. Pike, 17, Avonwick Road, Heston, Hounslow.
2 YU	—	C.W. and Telephony	G. W. Hale and R. Lyle, 36, Dagnall Park, South Norwood, S.E.25. Portable Station.
2 YV	10	—	George Milton, Whitehouse, Allport House, Cannock.
2 YY	10	C.W. and Telephony	O. H. Patterson, 26, Allerton Road, Stoke Newington, N.16.
2 ZC	—	Spark, C.W. and Telephony	General Radio Co. and The Cox-Cavendish Electrical Co. Transmitting Station, Tyford Abbey Works, Acton Lane, Harlesden, N.W.10.
2 ZD	10	C.W. and Telephony	A. Woodcock, 1, Montague Road, Handsworth, Birmingham.
2 ZK	10	C.W. and Telephony	W. L. Turner, Purley, Caldý, near Birkenhead.
2 ZL	10	Spark	H. W. Gee, 44, Gordon Street, Gainsborough, Lincs.
2 ZM	10	C.W., T.T. and Telephony	T. H. Isted, Terling, Witham, Essex.
2 ZP	—	C.W. and Telephony	G. F. Forwood, West Chart, Limpsfield, Surrey.
2 ZU	—	Spark, C.W. and Tonic Train	T. Heckles, 30, Thackeray Street, Liverpool.
2 ZV	10	C.W. and Telephony	F. T. Smith, Rutlands, Felsted.
2 ZY	—	—	Manchester Station of British Broadcasting Company.
5 AA	—	—	<i>The Leicester Mercury</i> , Leicester.
5 AF	—	—	J. A. H. Devey, 232, Great Brickkiln Street, Wolverhampton.
5 AG	10	Spark, C.W. and Telephony	A. E. Gregory, 77, Khedive, Road, E.7.
5 AJ	5	C.W. and Telephony	Walter C. Barraclough, 9, Rutland Avenue, Withington, Manchester
5 AJ	—	Experimental Station	Burndept., Ltd., 61, Bridge Street, Manchester.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
5 AK	10	Spark, C.W., T.T. and Telephony	H. Guy Mansell, Cleeve View Harvington, near Evesham.
5 AN	—	Spark, C.W. and Telephony	W. J. Joughin, 21, Troughton Road, Charlton, S.E.7.
5 AO	—	C.W. and Telephony	H. H. Elson, 142, Birchfield Road, Birmingham.
5 AT	—	—	Dubilier Condenser Company (1921), Ltd., Shepherds Bush, W.12.
5 AU	—	—	Dubilier Condenser Company (1921), Ltd. Experimental station. (Artificial Aerial.)
5 AV	—	—	Robert W. Harvey, 25, Shakespeare Avenue, Portswood, Southampton.
5 AW	10	C.W. and Telephony	Frank Hough (Southport), Ltd., 60, Sussex Road, Southport.
5 AZ	10	Spark, C.W. and Telephony	F. Charnley, 43, Read's Avenue, Blackpool.
5 BG	10	C.W. and Telephony, T.T.	J. B. Kaye, 12, Close Hill, Lockwood, Huddersfield
5 BH	10	—	A. V. Simpson, 28, Westgate, Burnley.
5 BL	—	C.W. and Telephony	Arthur E. Vick, 19, Gresham Road, Hall Green, Birmingham.
5 BM	10	C.W. and Telephony	J. T. Quick, 164, Portland Road, Edgbaston, Birmingham.
5 BV	—	C.W. and Telephony	Hugh N. Ryan, 88 Home Park Road, Wimbledon Park, S.W.19.
5 BW	—	—	A. de Villiers, 79, St. George's Road, S.E.1.
5 CD	—	C.W. and Telephony	G. Ward Booth, Albany House, Clarkson Avenue, Wisbech.
5 CF	—	—	Frederick G. S. Wise, 7, Vernon Road, Hornsey, N.8.
5 CK	—	—	Pearson Bros., 54-56, Long Row, Nottingham.
5 CP	—	—	V. L. Fellows, 20, North Common Road, Ealing, W.5.
5 CU	10	—	J. A. Walshaw, Garnett Villa, Otley, near Leeds.
5 CV	—	C.W. and Telephony	R. J. Harrison, "Seaton," Walton-on-Thames, Surrey.
5 CX	10	C.W. and Telephony	A. Higson, 161, Cotton Tree Lane, Colne, Lancashire. (Artificial Aerial).
5 DA	10	Spark, C.W. and Telephony	G. Gore, 24, Brucegate, Berwick-on-Tweed
5 DB	10	C.W., I.C.W. and Telephony	C. H. P. Nutter, 243a, Selhurst Road, S.E.25.
5 DM	10	C.W., T.T. and Telephony	A. N. Jackson Ley, Grove House, Albert Grove, Nottingham.
5 DN	10	Spark, C.W., T.T. and Telephony	Capt. L. A. K. Halcomb, "South Dene," 106, Millhouses Lane, Sheffield.

Experimental Wireless Transmitting Stations—(continued).

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
5 DO	—	C.W. and Telephony	E. J. Watts, 6, Ashley Road, Salisbury.
5 DP	10	Spark - - -	Sea Scouts Headquarters (F. L. Stollery, "Fairmead," Vista Road), Clacton-on-Sea.
5 DV	—	Spark Transmitter	D. Whitaker, 56, Park Road, St. Annes-on-Sea.
5 GB	10 and 100	Spark, C.W., T.T. and Telephony	L. Humphries, L. Humphries & Co., 61, Geraint Street, Princes Park, Liverpool.
5 GJ	—	—	James Bevis, 4, Somerset Road, Hertford Estate, near Stanford-le-Hope, Essex.
5 GL	10	C.W. and Telephony	N. G. Baguley, Hon. Sec., Newark and District Wireless Society, The Park, Newark.
5 GP	—	Morse and Telephony	J. B. Simpson, "Baskerville," Epsom Road, Guildford.
5 HA	—	Spark, C.W. and Telephony	R. W., 35, Fairview Road, Oxtou, Birkenhead.
5 HV	10	Telephony - -	Baynham Honri, Cromwell Hall, E. Finchley, N.2.
5 HX	—	C.W. and Telephony	C. H. Gardner, Electrical Disposals Syndicate, 6, Market Place, near Oxford Circus, W.1.
5 IC	10	C.W. and Telephony	F. E. Harvey, "Fairmead," Sunset Avenue, Woodford Green, Essex.
5 IG	10	C.W. and Telephony	J. E. Sheldrick, B.Sc., "The Brambles," Third Avenue, Denville, Havant, Hants.
5 IO	10	—	Wireless Equipment, Ltd. (Test Station), R. H. Brown, 10, Coverdale Road, Shepherd's Bush, W.12.
5 IT	—	—	Birmingham Station of the British Broadcasting Company.
5 JD	—	—	F. Bulmer, 4, Carlton Terrace, Scarborough.
5 JX	10	C.W. and Telephony	M. G. Scroggie, 37, Cluny Gardens, Edinburgh.
5 KA	10	C.W., I.C.W. and Telephony	G. C. Beddington, Stagsden, West Cliff Road, Bournemouth.
5 KB	10	C.W. and Telephony	F. W. Coomer, Britannia Road, Worcester.
5 KP	10	Spark, C.W. and Telephony	A. T. Wallace, "Brettenham," Hedge Lane, Palmer's Green, N.13.
5 LG	—	C.W. and Telephony	J. F. Johnston, 5, Victoria Park, Stockport.

The following are Amateur and Experimental
Stations in France.

Call Letters.	Power in Watts.	System of Transmission.	Name and Address.
8 AA	—	—	A. Riss, 38 bis, Boulevard Sainte Beuve à Boulogne-sur-Mer, Pas de Calais.
8 AB	100	C.W.	Léon Deloy, 55, Boulevard Mont Boron à Nice, Alpes Maritimes.
8 AC	200	—	Achille Fabre, rue du Roc à Albi Tarn.
8 AD	—	Spark	J. Roussel, 12, rue Hoche à Juvisy- sur-Orge, Seine et Oise.
8 AE	—	—	La T. S. F. Moderne 11, Avenue de Saxe, Paris, Station Installée à Reuil Seine et Oise.
8 AF	—	—	—
8 AG	—	—	Colmant, 16, Avenue de Robinson à Chatenay par Sceaux Seine et Oise.
8 AH	—	C.W. and Telephony	Marcel Coze, 7, rue Lala, Paris 16e.
8 AI	—	—	—
8 AJ	—	—	—
8 AK	—	—	—
8 AL	—	—	—
8 AM	—	—	—
8 AN	—	—	Charles Brémans, 167, Boulevard du Montparnasse, Paris 6e.
8 AO	—	—	Lardry, Radio Club de l'Ouest, Le Mans, Sarthe.
8 AP	—	—	—
8 AQ	—	—	Sassi, à Arpajon, Seine-et-Oise.
8 AR	—	—	Le Saulnier, à Boisguillaume par Rouen Seine Inférieure.
8 AS	—	—	Coisy, 76, Avenue du chemin de fer à Reuil, Seine-et-Oise.
8 AT	—	—	—
8 AU	—	—	Barrelier, Le Mans, Sarthe.
8 AV	—	—	—
8 AW	—	—	—
8 AX	—	—	—
8 AY	—	—	G. Thuillier, à Alger.
8 AZ	—	—	M. Borne, à Vanves, Seine.
8 BA	—	—	—
8 BB	—	—	J. Laborie, 3 rue du Midi à Nuilly, Seine.
8 BC	—	—	N. Druelle, Président de la Radio Association Compiègnoise (Oise).
8 BD	—	—	Dubois, 211, Boulevard Saint Germain, Paris.

Additions to the above list will be published from time to time in
the "Wireless World and Radio Review."

The information is compiled from particulars kindly supplied by
the owners of the stations concerned.

ADDITIONS.

ADDITIONS.

REGULAR TRANSMISSIONS OF WIRELESS STATIONS.

0200	Air Ministry	GFA	4,400	C.W.	Meteorological report and route traffic.
0200	Air Ministry	GFA	1,400	C.W.	Meteorological message (0100 observation).
0210	Warsaw	WAR	2,500	Spark.	Meteorological report.
0255	Annapolis	NSS	17,000	C.W.	Time signals followed by weather reports.
0328	Paris (Le Bourget)	ZM	1,680	C.W.	Hourly route. Meteorological report (summer only).
0430	Paris	FL	8,000	C.W.	Press in French and traffic with MSK .
0535	Air Ministry	GFA	1,680	C.W.	Hourly route. Meteorological report.
0650	Königswusterhausen	LP	5,250	C.W.	European synoptic meteorological report.
0700	Königswusterhausen	LP	2,500	C.W.	Telephony.
0730	Gibraltar	BWW	4,800	C.W.	Naval weather report to Air Ministry (GFA).
0735	Air Ministry	GFA	1,680	C.W.	Meteorological message (aviation).
0750	Air Ministry	GFA	900	C.W.	Calibration waves.
0800	Lyons	YN	15,500	C.W.	Time signals (beats) in sidereal time.
0800	Rome	IDO	11,000	C.W.	Press in French.
0800	Air Ministry	GFA	1,680	C.W.	Calibration waves.
0800	Gibraltar	BWW	4,800	C.W.	Meteorological message (plain language).
0845	Air Ministry	GFA	1,680	C.W.	Calibration waves.
0925	Paris	FL	2,600	Spark.	International time signals.
0945	Bucharest	BUG	7,400	C.W.	Press in French.
1000	Paris	FL	2,600	Spark.	Time signals (beats) in sidereal time.
1007	Paris	LO	6,500	C.W.	Calibration waves on 1st, 10th and 20th of month.
1010	Warsaw	WAR	2,100	Spark.	Press message.
1020	Paris	LO	8,000	C.W.	Calibration waves on 1st, 10th and 20th of month.
1035	Paris	FL	2,600	Spark.	Times for 1,000 time signals.
1035	Paris	LO	1,680	C.W.	Calibration waves on 1st, 10th and 20th of month.
1038	Paris	FL	2,600	Spark.	Groups indicating exact sidereal time of beats, 1 and 300 of rhythmic signals sent at 1000 time signals.
1044	Paris	FL	2,600	Spark.	Time signals (old system).
1100	Eilvese	OUI	9,600	C.W.	Transatlantic press (in German).
1100	Tyngby	OXE	5,600	C.W.	Press in English.
1155	Nauen	POZ	3,900	Spark.	Time signals and "Deteg" Code.
1200	Nauen	POZ	3,100	Spark.	Time Signals (International).
1205	Paris	FL	3,200	Spark.	Press in French.
1220	Nauen	POZ	9,400 4,700	C.W.	Press in German on 9,400; repeated on chopped C.W. on 4,700.
1230	Lyons	YN	15,100	C.W.	Press in English for NSS (Annapolis).
1315	Eilvese	OUI	14,400	C.W.	Press.
1330	Bordeaux	LY	23,450	C.W.	Press in English for WGG (Tuckerton).
1400	Air Ministry	GFA	4,100	C.W.	British synoptic meteorological message including reports from France and Iceland.
1400	North Foreland	GNF	600	Spark.	Navigation warnings.
1500 to 1700	The Hague	PCGG	1,050	—	Telephony (Sundays).

Regular Transmissions of Wireless Stations—(continued).

1700	Cadiz	..	..	EAC	..	2,500	..	Spark.	Press in Spanish.
1800	Paris	..	..	FL	..	5,000	..	C.W.	Calibration waves (3 minute dash 1st and 15th of each month).
1800	Moscow	..	..	MSK	..	5,100	..	Spark.	Press.
1810	Paris	..	..	FL	..	7,000	..	C.W.	Calibration waves (3 minute dash 1st and 15th of each month).
1820	Lyons	..	..	YN	..	10,000	..	C.W.	Calibration waves (3 minute dash 1st and 15th of each month).
1830	Lyons	..	..	YN	..	15,000	..	C.W.	Calibration waves (3 minute dash 1st and 15th of each month).
1845 to 1900	Lyons	..	..	YN	..	15,000	..	C.W.	(Exact values of calibration waves sent out on 1st and 15th of each month).
1900	Air Ministry			GFA	..	4,100	..	C.W.	British synoptic meteorological message (1,800 observation), including reports from Faroe and Iceland.
1900	Eilvese	..	..	OUI	..	9,600	..	C.W.	Press.
1945	Warsaw	..	..	WAR	..	2,100	..	Spark.	Press.
2000	Seafeld (Oxford)	..	..	GBL	..	8,750	..	C.W.	Press in English.
2000 to 2030	Writtle	..	..	2 MT	..	400	..	—	Telephony (Tuesday).
2005	Königswusterhausen			LP	..	5,250	..	C.W.	Meteorological message (aviation) and forecast for Central Europe.
2010	Paris	..	..	FL	..	8,000	..	C.W.	French press.
2030	Bordeaux	..	..	LY	..	23,450	..	C.W.	Press in French.
2030	Nauen	..	..	POZ	..	9,400	..	C.W.	German press on 9,400; repeated on chopped C.W., 4,700.
2030	Lyons	..	..	YN	..	15,100	..	C.W.	Press.
2120 to 2220	The Hague	..	..	PCGG	..	1,050	..	—	Telephony (Monday and Thursday).
2045	Levallois	..	..	—	..	1,565	..	—	Radiola Concert.
2155	Moscow	..	..	MSK	..	5,000	..	Spark.	Time signal commencing with V's.
2200	Paris	..	..	FL	..	2,600	..	Spark.	Time signals (beats) in sidereal time.
2200	Moscow	..	..	MSK	..	5,000	..	Spark.	Time signals (series of beats) and Russian synoptic meteorological message.
2230	Lyons	..	..	YN	..	15,100	..	C.W.	Press in French.
2235	Paris	..	..	FL	..	2,600	..	Spark.	Times for 2,200 time signals.
2245	Paris	..	..	FL	..	2,600	..	Spark.	French time signals (old system)
2330	Nauen	..	..	POZ	..	12,600	..	C.W.	Transocean press.
2355	Nauen	..	..	POZ	..	3,900	..	Spark.	Time signals.

The following stations give almost continuous transmissions:—

Carnarvon	..	..	MUU	..	14,000	..	C.W.	Transatlantic traffic.
Devizes	..	..	GPU	..	2,100	..	C.W.	Marine traffic.
Stonehaven	..	..	GSW	..	4,600	..	C.W.	High speed commercial traffic with LP (Berlin); LP replies on 5,250 metres.
Marion	..	..	WSO	..	11,500	..	C.W.	Transatlantic traffic.
Tuckerton	..	..	WGG	..	16,100	..	C.W.	Transatlantic traffic.
New Brunswick	..	..	WHI	..	13,600	..	C.W.	Transatlantic traffic.
Glace Bay	..	..	GB	..	7,850	..	C.W.	Transatlantic traffic.
Tuckerton	..	..	WCI	..	16,800	..	C.W.	Transatlantic traffic.
Nauen	..	..	POZ	..	12,600	..	C.W.	Transatlantic traffic.
Eilvese	..	..	OUI	..	14,400	..	C.W.	Transatlantic traffic.
Stavanger	..	..	LCM	..	12,000	..	C.W.	Transatlantic traffic.
Long Island	..	..	WQK	..	16,465	..	C.W.	Transatlantic traffic.
Long Island	..	..	WQL	..	19,200	..	C.W.	Transatlantic traffic.
Ongar	..	..	GLB	..	3,800	..	C.W.	Working with Paris, UFP 2,300.
Ongar	..	..	GLA	..	2,900	..	C.W.	Working with Berne, HBB 3,400.
Ongar	..	..	GLO	..	4,350	..	C.W.	Working with Madrid, EAA 3,600.
Sainte Assise	..	..	UFT	..	15,000	..	C.W.	Working with Long Island, WQL 19,200.
Clifden	..	..	MFT	..	5,780	..	C.W.	Transatlantic traffic.

CODE

- (A) The Morse Code.
- (B) Extracts from the International Convention
on Safety of Life at Sea.
- (C) Extracts from the International Radio-tele
graphic Convention.

THE MORSE CODE

Two forms of Morse Code are in use, the "Continental Morse Code," and the "American Morse Code." The latter is now only officially recognised for use in land line telegraphs in America, so that the Continental Code is used universally in Radio work.

Continental Morse is a dot and dash system, every letter or symbol consisting of a combination of these. Considering as an element either a dot or a dash, no ordinary unaccented letter is represented by more than four elements. Some punctuation signs, numerals and whole words are represented by more than four elements.

Rules for formation of Continental Morse code :

These rules apply irrespective of the speed of transmission.

(1) The time occupied by a dash should be equal to that occupied by three dots.

(2) The time occupied by the interval between two elements of one letter or other symbol should be equal to the time occupied by one dot.

(3) The interval between two letters in a word should be equal to the time occupied by three dots.

(4) The interval between two words should be equal to the time occupied by five dots.

Letters.

CONTINENTAL MORSE.

a	• —	m	— —
ä	• — • —	n	— •
á	• — — —	ñ	— • — — —
ä	• — — — • —	o	— — —
b	— • • •	ö	— — — •
c	— • • •	p	• — — •
ch	— — — —	q	— — — —
d	— • •	r	• — •
e	•	s	• • •
é	• • — — •	t	—
f	• • • •	u	• • —
g	— — •	ü	• • — —
h	• • • •	v	• • • —
i	• •	w	• — — —
j	• — — —	x	— • • —
k	— • •	y	— • — —
l	• — • •	z	— — • •

Figures.

CONTINENTAL MORSE.

1	• — — — —	6	— • • • •
2	• • — — —	7	— — — • •
3	• • • — —	8	— — — • •
4	• • • • —	9	— — — • •
5	• • • • •	0	— — — — —

Abbreviated Continental Morse Figures.

1	• —	6	— • • • •
2	• • —	7	— • • •
3	• • • —	8	— • •
4	• • • • —	9	— •
5	• • • • •	0	—

Punctuation and Other Signs. —

CONTINENTAL MORSE.

Full stop	.. .. .	(.)	• • • • •
Semicolon	.. .. .	(;)	— • — • —
Colon	.. .. .	(:)	— — — • •
Comma	.. .. .	(,)	• — • — • —
Note of interrogation, or, request for a repetition	.. .. .	(?)	• • — — • •
Note of exclamation	.. .. .	(!)	— — • • — —
Apostrophe	.. .. .	(')	• — • — • •
Hyphen or dash	.. .. .	(-)	— • • • • —
Fractional bar	.. .. .	(/)	— • • • —
Brackets. <i>This sign must be made both before and after the words which are to be bracketed</i>	.. .. .	( )	— • — — • —
Inverted commas. <i>Must be made before and after the words which are to be quoted</i>	.. .. .	(" ")	• — • • — •
Underline. <i>Must be made before and after words which are to be underlined</i>	.. .. .		• • — — • —
Preliminary call. <i>To precede every transmission</i>	.. .. .		— • — • —
Double dash. <i>Generally called the "break sign." The signal separating preamble from address, address from text and text from signature</i>	.. .. .	(=)	— • • • —
End of message	.. .. .		• — • — •
Error. Means, "Erase." Some operators, however, use the repetition signal	.. .. .		• • • • •
Invitation to transmit	.. .. .		— • —
Wait	.. .. .	(AS)	• — • • •
"Received" signal	.. .. .		• —
Distress call. Formerly CQD	.. .. .	(SOS)	• • • — — • • •
"All stations"	.. .. .	(CQ)	— • • — — — —
End of work	.. .. .	(SK)	• • • — • —

Punctuation and Other Signs.

AMERICAN MORSE.

Full stop	..	..	..	..	(.)	• • — — • •
Semicolon	..	..	..	..	(:)	• • • • •
Colon	..	..	..	..	(:)	— — • • •
Comma	..	..	..	..	(,)	• — — —
Note of interrogation	..	..	..	..	(?)	— — • — •
Note of exclamation	..	..	..	..	(!)	— — — •
Apostrophe	..	..	..	..	(')	• • — • • — • •
Hyphen	..	..	..	..	(-)	• • • • • — • •
Dash	..	..	..	..	(—)	— • • • • — • •
Fractional bar	..	..	..	..	(/)	•
Bracket (begin)	..	..	..	..	( ( )	• • • • • — •
Bracket (end)	..	..	..	..	( ) )	• • • • • • • •
Inverted commas (begin)	..	..	..	..	("	• • — • — •
Inverted commas (end)	..	..	..	..	")	• • — • — • — •
Underline (begin)	..	..	..	..		• — — — • •
Underline (end)	..	..	..	..		• • — — — •
Dollars	..	..	..	..	(\$)	• • • • • — • •
Pounds (sterling)	..	..	..	..	(£)	• • • • • • — • •
Capital letter	..	..	..	..		• • • • • — • •
Decimal point	..	..	..	..	(DOT)	— • • • • • —
Paragraph	..	..	..	..	(¶)	— — — —
Per cent.	..	..	..	..		— • • —
&		• • • •

The following are extracted from the International Convention on Safety of Life at Sea :—

ARTICLE II.

SAFETY SIGNAL.

The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power :

— — — (T T T)

In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress.

The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes.

The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character.

When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

ARTICLE III.
MORSE CODE.

INTERNATIONAL SIGNALS.

These signals may be made at night or in thick weather, either by long and short flashes of light, or by long and short sound signals (whistles, fog-horns, etc.), or during the day by hand flags.

1.—URGENT AND IMPORTANT SIGNALS.

You are standing into danger..	..	..	• • —
I want assistance: remain by me	..	..	• • • —
Have encountered ice	..	..	• — —
Your lights are out (<i>or</i> , burning badly)	..	..	• — — •
The way is off my ship; you may feel your way past me	..	..	• — •
Stop (<i>or</i> , heave to); I have something important to communicate	..	..	• — • •
Am disabled; communicate with me	..	..	• • — •

2.—GENERAL SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.	How Answered.
Preparative ..	• • • • • &c.	A succession of E's in one group	By the general answer T.
Answer	—	T (singly)	
Spelling	• • — • • — •	F F in one group	By the general answer T.
Use International Code of Signals	— — — — —	M M M in one group	By the general answer T.
International Code Flag sign	— — — — —	M M in one group	
Break sign	• • • •	I I as separate letters	
Stop	• • • • •	I I I as separate letters	
Finish of the message	• • • — •	V E as one group	• — • R. — • • D. As separate letters.
Erase sign	• • • • &c.	A succession of E's as separate letters	By a succession of E's as separate letters.
Annul	W — — — W • • • — —	W W as one group	By W W as one group.
Repeat word after: (when a single word is required)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I W A • • • </div> <div> } I M I as one group W A as separate letters </div> </div> Followed by the word preceding the one required		By the general answer T.
Repeat all after: (if more than one word is required)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I A A A • — • — </div> <div> } I M I as one group A A as separate letters </div> </div>		By the general answer T.
Repeat all: (if the whole message is to be repeated)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I A L L — • — • • — • </div> <div> } I M I as one group A L L as separate letters </div> </div>		By the general answer T.

3.—NATIONALITY SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made
American	— • • • — • •	C D as separate letters.
Argentine	— • • • — • •	C G " "
Austro-Hungarian	— • • • — • •	C F " "
Belgian	— • • • — • •	D C " "
Brazilian	— • • • — • •	D E " "
British	— • • • — • •	F.
Bulgarian	— • • • — • •	D F as separate letters.
Chilian	— • • • — • •	D G " "
Chinese	— • • • — • •	E C " "
Colombian	— • • • — • •	E D " "
Danish	— • • • — • •	E F " "
Dutch	— • • • — • •	E G " "
French	— • • • — • •	E.
German	— • • • — • •	G.
Greek	— • • • — • •	M M in one group followed by D.
Italian	— • • • — • •	C E as separate letters.
Japanese	— • • • — • •	C.
Mexican	— • • • — • •	F C as separate letters.
Norwegian	— • • • — • •	M M in one group followed by C.
Peruvian	— • • • — • •	F D as separate letters.
Portuguese	— • • • — • •	F E " "
Russian	— • • • — • •	D.
Siamese	— • • • — • •	F G as separate letters.
Spanish	— • • • — • •	G C
Swedish	— • • • — • •	M M in " " followed by E.
Turkish	— • • • — • •	G D as separate letters.
Uruguayan	— • • • — • •	G E " "
Venezuelan	— • • • — • •	G F " "

4.—INSTRUCTIONS.

1. THE URGENT AND IMPORTANT SIGNALS may be made without the Preparative Signal being answered if it is supposed that the person addressed cannot reply, or in other special circumstances; but in this case a pause should be made between the Preparative Signal and the message.

2. THE SIGNAL • • — • • • — • • (FF) is used previous to any letters which are intended to spell words.

3. THE SIGNAL — — — — — (MMM) is used previous to any message sent by means of the International Code of Signals.

4. THE SIGNAL — — — — — (MM) means the Code Flag of the International Code of Signals, and is used as indicated in the Code Book.

5. THE BREAK SIGN is used between the address of the receiver and the text of the message, and after the message if the name of the sender is to be signalled.

6. THE STOP is used, where necessary, in the text of the signal.

7. THE ERASE is used to cancel the last word or signal group, sent by mistake.

8. THE ANNUL is used to cancel *all* the message.

9. METHOD OF ANSWERING. Each word or signal group, when understood, is to be answered by one long flash — (T).

If a word or signal group is not answered, the sender is to repeat it until answered by a long flash.

At the end of the message, if understood, the receiver will make • • — • • • • (RD).

The Erase and Annul signs are to be answered by their own signs.

10. THE NATIONALITY SIGNAL is made immediately after the answer to the Preparatory Signal has been received, to indicate the nationality of the vessel making the signal. It is answered by the nationality signal of the vessel receiving the message.

The following are extracted from the International Radiotelegraphic Convention.

APPENDIX.

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS.

Abbrevia- tion. 1.	Question. 2.	Answer or Advice. 3.
— • — • — • — (CQ)	.. .. .	Inquiry signal employed by a station which desires to correspond.
— • — • — (TR)	.. .. .	Signal announcing the sending of indications concerning a ship station (Article XXVIII).
— — • — • — (I)	.. .. .	Signal indicating that a station is about to send with high power.
PRB	Do you wish to communicate with my station by means of the International Signal Code?	I wish to communicate with your station by means of International Signal Code.
QRA	What is the name of your station?	This station is.....
QRB	How far are you from my station?	The distance between our station is..... nautical miles.
QRC	What are your true bearings?	My true bearings are.....degrees.
QRD	Where are you bound?	I am bound for.....
QRF	Where are you coming from?	I am coming from.....
QRG	To what company or line of navigation do you belong?	I belong to.....
QRH	What is your wavelength?	My wavelength is.....metres.
QRJ	How many words have you to transmit?	I have.....words to transmit.
QRK	How are you receiving?	I am receiving well.
QRL	Are you receiving badly? Shall I transmit 20 times • • • • • so that you can adjust your apparatus.	I am receiving badly. Transmit 20 times • • • • • so that I can adjust apparatus.
QRM	Are you disturbed?	I am disturbed.
QRN	Are the atmospherics very strong?	The atmospherics are very strong.
QRO	Shall I increase my power?	Increase your power.
QRP	Shall I decrease my power?	Decrease your power.
QRQ	Shall I transmit faster?	Transmit faster.
QRS	Shall I transmit more slowly?	Transmit more slowly.
QRT	Shall I stop transmitting?	Stop transmitting.
QRU	—	I have nothing to transmit.
QRV	Are you ready?	I have nothing for you.
QRW	Are you busy?	I am ready. All is in order.
QRX	Shall I wait?	I am busy with another station (or with please do not interrupt).
QRY	What is my turn?	Wait. I will call you at.....o'clock (or when I want you).
QRZ	Are my signals weak?	Your turn is No.....
QSA	Are my signals strong?	Your signals are weak.
QSB	Is my tone bad?	Your signals are strong.
QSC	Is my spark bad?	The tone is bad.
QSD	Is the spacing bad?	The spark is bad.
QSF	Let us compare watches. My time is What is your time?	The spacing is bad.
QSG	Are the radiotelegrams to be transmitted alternately or in series?	The time is.....
QSH	—	Transmission will be in alternate order.
QSI	—	Transmission will be in series of five radiotelegrams.
QSK	What is the charge to collect for....?	Transmission will be in series of ten radiotelegrams.
QSL	Is the last radiotelegram cancelled?	The charge to collect is.....
QSM	Have you got the receipt?	The last radiotelegram is cancelled.
QSN	What is your true course?	Please give a receipt.
QSO	Are you communicating with land?	My true course is.....degrees.
QSP	Are you in communication with another station (or with.....)?	I am not communicating with land.
	Shall I signal to that you are calling him?	I am in communication with (through the medium of.....).
		Inform that I am calling him.

Abbreviation.	Question.	Answer or Advice.
1.	2.	3.
QSQ	Am I being called by.....?	You are being called by.....
QSR	Will you dispatch the radiotelegram?..	I will forward the radiotelegram.
QST	Have you received a general call? ..	General call to all stations.
QSU	Please call me when you have finished (or at.....o'clock)	I will call you when I have finished.
QSV	Is public correspondence engaged? ..	Public correspondence is engaged. Please do not interrupt.
QSW	Must I increase the frequency of my spark?	Increase the frequency of your spark.
QSX	Must I diminish the frequency of my spark?	Diminish the frequency of your spark.
QSY	Shall I transmit with a wavelength of	Let us transfer to the wavelength of..... metres.
QSZ	.. .. .	Transmit each word twice. I have difficulty in receiving your signals.
QTA	.. .. .	Transmit each radiotelegram twice. I have difficulty in receiving your signals or
		Repeat the radiotelegram you have just sent. Reception doubtful.
QTB	.. .. .	Number of words not agreed; I will repeat first letter of each word and first figure of each group.
QTC	Have you anything to transmit? ..	I have something to transmit. I have one (or several) radiotelegrams for..

When an abbreviation is followed by a mark of interrogation it applies to the question indicated in respect of that abbreviation.

In addition to these signals, which, it will be observed, are uniform in construction, the following signals of the International Telegraph Code may be used in these communications:—

- • — • • • "Repeat" sign (as well as mark of interrogation).
- • • — • • Understood.
- — • • • • Wait.

EXAMPLES.

Station		
A	QRA?	What is the name of your station?
B	QRA Campania	This is the Campania.
A	QRG?	To what company or line of navigation do you belong?
B	QRG Cunard. QRZ	I belong to the Cunard Line. Your signals are weak.
Station A then increases the power of its transmitter and sends:—		
A	QRK?	How are you receiving?
B	QRK	I am receiving well.
	QRB 80	The distance between our stations is 80 nautical miles.
	QRC 62	My true bearings are 62 degrees, etc.

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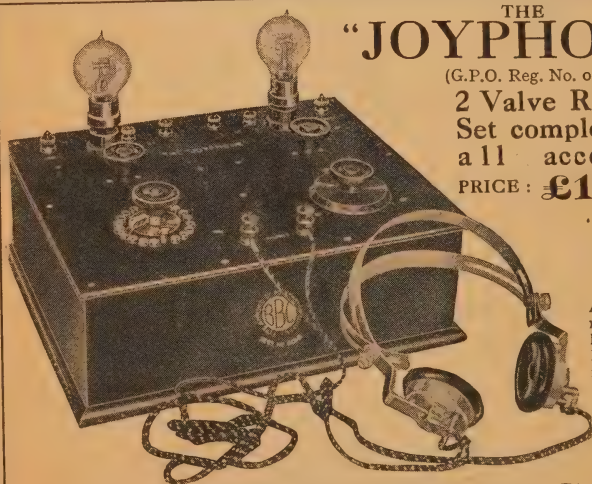
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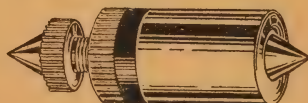
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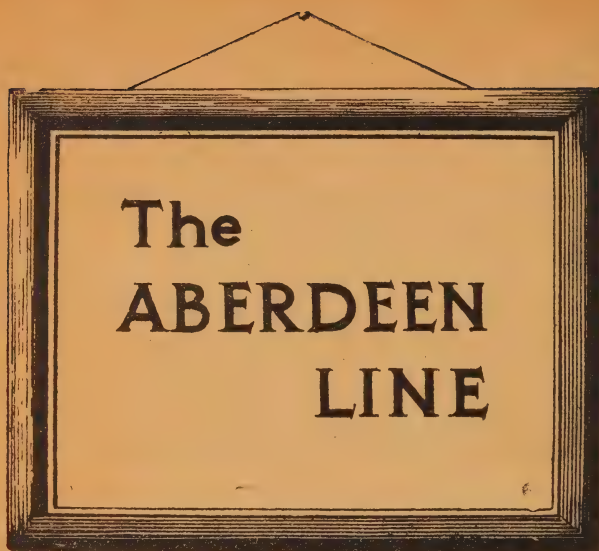
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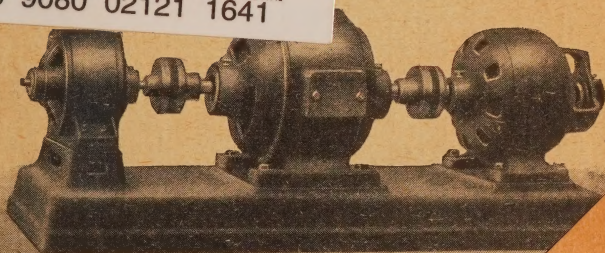
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